

Advances in Science, Technology & Innovation
IEREK Interdisciplinary Series for Sustainable Development



Miroslav Mateev
Panikkos Poutziouris *Editors*

Creative Business and Social Innovations for a Sustainable Future

Proceedings of the 1st American University in the Emirates
International Research Conference—Dubai, UAE 2017

Advances in Science, Technology & Innovation

IEREK Interdisciplinary Series for Sustainable
Development

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Miroslav Mateev · Panikkos Poutziouris
Editors

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in the Emirates International Research
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Editors

Miroslav Mateev
American University in the Emirates
Dubai, United Arab Emirates

Panikkos Poutziouris
UCLan Cyprus
Larnaka, Cyprus

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Preface

The 1st American University in the Emirates International Research Conference (AUEIRC) held on November 15–16, 2017, has become one of the major events of the year in the field of creative business and social innovation. AUEIRC 2017 was organized under the patronage of His Excellency Sultan bin Saeed Al Mansouri, Cabinet Member and Minister of Economy of UAE. This conference aims to provide a vibrant platform for academicians, researchers, scientists, and industrial practitioners from all over the world to meet, exchange ideas and network, and discuss the challenges and opportunities for businesses in the contemporary world. The proceedings will be published in the *Advances in Science, Technology & Innovation* book series of *Springer*.

The general aim of AUEIRC 2017 is to promote international collaboration in education and research in all fields of creative business and innovation that can scale for the benefit of communities. The International Scientific Committee comprises over 80 international experts in various fields as per the themes of the conference. The conference keynote speakers include Suzanne Trager Ortega, President of the Council of Graduate Schools (USA), Prof. Galal Hassan Galal-Edeen (University of London, UK), and Prof. Ali Emrouznejad (Aston University, UK).

The scope of AUEIRC 2017 includes a broad range of topics on areas that contemporary society. We have received 231 abstracts and 108 full papers from 42 countries in six different tracks, namely Creative Business and Social Innovation, Education and Social Innovation, Media for Smart Cities, Creative Industries and Social Innovation, Governance and Legislation, and Smart Technologies and Innovation. The panels are divided based on tracks and all papers are presented in 24 sessions. Each session has a chairperson, while each paper has a discussant. A double-blind peer review process enabled 106 papers to be accepted for publication (in two edited volumes) in *Springer*. On behalf of the AUEIRC 2017 Standing Committee, we would like to thank all the referees, track chairs, discussions, and paper authors.

AUEIRC has been planned to enable postgraduate students from the American University in the Emirates and other academic institutions to participate in the conference and share their research experience with an international community of academics and industry experts. The best paper (in terms of quality and practicality) presented at the conference was awarded US \$1000. The recipient of the Best Paper Award was the paper titled “Optimizing Turbo Codes for Secret Key Generation in Vehicular Ad Hoc Networks.” This paper’s authors/co-authors are Dr. Dhouha Kbaier Ben Ismail (University of Bedfordshire), Dr. Petros Karadimas (University of Glasgow), Dr. Gregory Epiphaniou (University of Bedfordshire), and Dr. Haider Al-Khateeb (University of Bedfordshire).

On behalf of the AUEIRC 2017 Standing Committee, we would like to thank everyone who made the conference a reality. In particular, we would like to thank Prof. Muthanna (Conference Chairperson), who contributed all resources at his disposal to ensure the high standard of the conference. We also thank our Provost Prof. Abhilasha for her contributions and for attending meetings to guarantee that the conference is on track. We likewise extend our gratitude to the entire AUE Board of Trustees, who were present on campus during the

conference, for their support. We also thank the members of the conference steering committee for their hard work, dedication, and continuous support throughout the preparation and implementation of the conference's activities. Moreover, we are grateful to the event management, IT, auxiliary services, media, security, PR, and protocol teams. We likewise extend our thanks to all faculty and staff members from different committees for their support in organizing the conference and ensuring its success.

Overall, we express our heartfelt thanks to the keynote speakers, who managed their busy schedules and graciously agreed to deliver inspiring messages. We believe that AUEITC 2017 was a high-quality event with remarkable success, although you must judge this matter for yourselves. We are optimistic that you will enjoy reading the collection of papers included in this book.

Dubai, United Arab Emirates
Larnaka, Cyprus

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Prof. Panikkos Poutziouris

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A MRI View of Brain Tumor Outcome Prediction

Cristiana Neto , Inês Dias , Maria Santos , Victor Alves , Filipa Ferraz , João Neves , Henrique Vicente , and José Neves 

Abstract

On the one hand, *cancer* and *tumor* are one of the most feared terms in today's society. It refers to an unstable growth of cells that potentially invade the surrounding tissues and may eventually lead to edema or even death. On the other hand, the term *tumor* is often misleading since people assume that it is the same as *cancer*, but this is not necessarily true. A *cancer* is a particularly threatening type of *tumor*. The word *tumor* simply refers to a mass, and in particular a *brain tumor* is a mass located in the patient's brain that may seriously threaten his/her life. Thus, it is crucial to study which factors may influence the outcome of a *brain tumor* to improve the given treatment or even make the patient more contented. Therefore, this study presents a decision support system

based on *Magnetic Resonance Imaging (MRI)* data or knowledge (if the data is presented in context) that allows for brain *tumor outcome prediction*. It describes an innovative approach to cater for brain illness where *Logic Programming* comes in support of a computational approach based on *Case Based Reasoning*. An attempt is made to predict whether a patient will die or survive with or without a *tumor*, where the data or knowledge may be of type *unknown*, *incomplete* or even *self-contradictory*.

Keywords

Brain tumor • Feature extraction • Brain tumor outcome prediction • Logic programming • Knowledge representation and reasoning • Case-based reasoning • 3D slicer • Magnetic resonance imaging

C. Neto · I. Dias · M. Santos
Departamento de Informática, Universidade do Minho, Braga,
Portugal
e-mail: crisneto95@gmail.com

I. Dias
e-mail: ines3dias@gmail.com

M. Santos
e-mail: mjmsantos95@gmail.com

V. Alves · F. Ferraz · H. Vicente · J. Neves (✉)
Centro Algoritmi, Universidade do Minho, Braga, Portugal
e-mail: jneves@di.uminho.pt

V. Alves
e-mail: valves@di.uminho.pt

F. Ferraz
e-mail: filipatferraz@gmail.com

H. Vicente
e-mail: hvicente@uevora.pt

J. Neves
Mediclinic Arabian Ranches, Dubai, 282602 United Arab
Emirates
e-mail: joaocpneves@gmail.com

H. Vicente
Departamento de Química, Escola de Ciências e Tecnologia,
Centro de Química de Évora, Universidade de Évora, Évora,
Portugal

1 Introduction

A brain tumor is characterized by the abnormal multiplication of some brain cells, resulting in a mass that hereafter will start to compress and injure the normal cells of the brain.

According to tumor classification, it can be either primary, a case where tumors start their formation in the brain itself, or secondary, where tumors begin in another part of the body and spread till the brain through metastasis. The former ones can be considered benign or malignant, whereas the newest can only be described as malignant, where the word *cancer* is only used when the tumor was caused by malignant cells [1, 2].

Besides that, tumor localization is also crucial, as it appears to be related to prognosis. Bearing in mind that every tumor type manifests different symptoms that vary according to the affected brain zone, either from headaches, vision problems, mental illnesses or vomiting, the treatment may include a combination of surgery, radiotherapy or

chemotherapy. Also, a recurring process for the prognosis is to measure the patient's performance status. This is an attempt to quantify cancer patients' general well-being and activities of daily life, using evaluation systems entitled as Karnofsky score, that runs from 100 to 0, where 100 denotes perfect health and 0 means death.

Despite their diverse histological types, most brain tumors cause brain edema (excess accumulation of fluid in the intracellular or extracellular spaces of the brain), which is a significant cause of patient morbidity and mortality [3]. Indeed, due to the large amount of tumor-related deaths, it is crucial to invest in auxiliary diagnostic studies such as *Computed Tomography (CT)* or *Magnetic Resonance Imaging (MRI)*, as a consequence of a large variance in some tumor characteristics, namely in its size, shape, location, edema or intensities [4].

In image processing, feature selection and extraction methods are related to dimensionality reduction, where the selected features contain the relevant information avoiding redundant and irrelevant ones.

2 Knowledge Representation and Reasoning

Many approaches to Knowledge Representation and Reasoning have been proposed using the *Logic Programming (LP)* epitome, namely in the area of *Model Theory* [5, 6] and *Proof Theory* [7, 8]. In the present work, the *Proof Theoretical* approach in terms of an extension to the *LP* language is followed. An *Extended Logic Program* is, therefore, given by a finite set of clauses, in the form:

$$\{ \begin{array}{l} \neg p \leftarrow \text{not } p, \text{not } \text{exception}_{p_1} \\ p \leftarrow p_1, \dots, p_n, \text{not } q_1, \dots, \text{not } q_m \\ ?(p_1, \dots, p_n, \text{not } q_1, \dots, \text{not } q_m) \quad (n, m \geq 0) \\ \text{exception}_{p_1}, \dots, \text{exception}_{p_j} \quad (0 \leq j \leq k), \text{ being } k \text{ an integer number} \end{array} \}$$

scoring_{value}

where the first clause stand for predicate's closure, “,” denotes “logical and”, while “?” is a domain atom denoting falsity, the p_i , q_j , and p are classical ground literals, i.e., either positive atoms or atoms preceded by the classical negation sign \neg [8]. Indeed, \neg stands for a strong declaration that speaks for itself, and *not* denotes *negation-by-failure*, or in other words, a flop in proving a given statement, once it

was not declared explicitly. Under this formalism, every program is associated with a set of *abducibles* [5, 6], given here in the form of exceptions to the extensions of the predicates that make the program, i.e., clauses of the form:

$$\text{exception}_{p_1}, \dots, \text{exception}_{p_j} \quad (0 \leq j \leq k),$$

being k an integer number

that stand for data, information or knowledge that cannot be ruled out. On the other hand, clauses of the type:

$$?(p_1, \dots, p_n, \text{not } q_1, \dots, \text{not } q_m) \quad (n, m \geq 0)$$

also named *invariants*, allows one to set the context under which the universe of discourse has to be understood. The term *scoring_{value}* stands for the relative weight of the extension of a specific predicate with respect to the extensions of peers ones that make the inclusive or global program.

In order to evaluate the data, information or knowledge's quality that may be associated to a logic program, an assessment of it, denote as *QoI*, is given by a truth-value ranging between 0 and 1 [9, 10]. Thus, $QoI_i = 1$ when the information is *known* (*positive*) or *false* (*negative*), and $QoI_i = 0$ if the information is *unknown*. Finally, for situations where the extension of a given *predicate_i* is taken from a set of terms, $QoI_i \in]0, 1[$, i.e.:

$$QoI_i = 1/Card \quad (1)$$

where *Card* denotes the cardinality of the *abducibles* set for i , if the *abducibles* set is disjoint. If the *abducibles* set is not

disjoint, the clause's set is given by $C_1^{Card} + \dots + C_{Card}^{Card}$, under which the *QoI*'s evaluation takes the form:

$$QoI_{i_1 \leq i \leq Card} = 1/C_1^{Card}, \dots, 1/C_{Card}^{Card} \quad (2)$$

where C_{Card}^{Card} is a card-combination subset, with *Card* elements. For example, the logic program depicted below:

$$\{$$

$$\neg f_1(X, Y, Z) \leftarrow \text{not } f_1(X, Y, Z), \text{not exception}_{f_1(X, Y, Z)}$$

$$f_1(\underbrace{[5, 7], \perp, 6.5}_{\text{attribute's values}})$$

$$\underbrace{[0, 8] [12, 36] [5, 10]}_{\text{attribute's domains}}$$

$$\text{exception}_{f_1}(4, [30, 35], \perp), \dots, \text{exception}_{f_k}(\perp, 10, [7, 8])$$

$$\} :: 1 \text{ (once the universe of discourse is set in terms of the extension of only one predicate)}$$

where \perp denotes a null value of the type *unknown*, stands for a logic program that denotes a particular universe of discourse in its initial form. Then, it is now possible to split the *abducible* or *exception* set into the admissible clauses or terms and evaluate their *QoIs*. A pictorial view of this process, in general terms, is given below as a pie chart (Fig. 1).

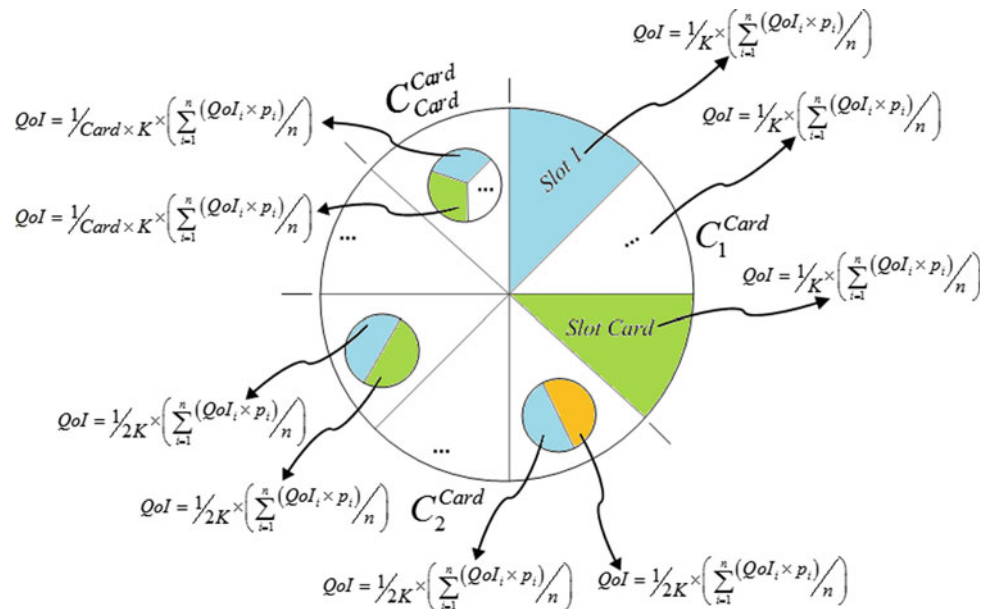
Under this setting, a new evaluation factor has to be considered, which will be denoted as *DoC*, that stands for one's confidence that the argument values or attributes of the terms that make the extension of a given predicate, having into consideration their domains, fit into a given interval [11]. The *DoC* is evaluated as shown in Fig. 2 and computed using $DoC = \sqrt{1 - \Delta l^2}$, where Δl stands for the argument interval length, which was set in the interval [0, 1]. Thus, the universe of discourse is engendered according to the information presented in the extensions of such predicates, according to productions of the type:

$$\text{predicate}_i - \bigcup_{1 \leq j \leq m} \text{clause}_j(([A_{x_j}, B_{x_j}](QoI_{x_j}, DoC_{x_j})), \dots,$$

$$([A_{x_n}, B_{x_n}](QoI_{x_n}, DoC_{x_n}))) :: QoI_j :: DoC_j$$

(3)

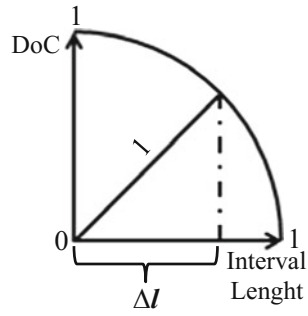
Fig. 1 *QoI*'s values for the *abducible* set of clauses referred to above. The clauses cardinality set, K , is given by the expression $C_1^{Card} + C_2^{Card} + \dots + C_{Card}^{Card}$, where $\sum_{i=1}^n (QoI_i \times p_i) / n$ denotes the attributes *QoI*'s average of each clause or term. p_i stands for the relative weight of attribute i with respect to its peers, being $\sum_{i=1}^n p_i = 1$



where \cup , m and for example $[A_{x_j}, B_{x_j}]$ stand for, respectively, set union, the cardinality of *predicate* _{i} extension and the extremes of the interval where attribute *attribute* _{j} may, in principle, be situated.

In the present study both *qualitative* and *quantitative* data/information/knowledge are presented. Aiming at the quantification of the *qualitative* part and in order to make easy the understanding of the process, it will be presented in a graphical form. Taking as an example a set of n issues regarding a particular subject, where there are k possible choices (e.g., *absence*, *low*, ..., *high* and *very high*), an unitary area circle, split into n slices, was itemized. The marks in the axis correspond to each of the possible options. Thus, if the answer to issue 1 is *high* the area correspondent is $(k - 1) / (k \times n)$ (Fig. 3a). Assuming that in the issue 2 are chosen the alternatives *high* and *very high*, the correspondent area ranges between $[(k - 1) / (k \times n), 1/n]$ (Fig. 3b). Finally, in issue n if no alternative is ticked, all the hypotheses should be considered and the area varies in the range $[0, 1/n]$ (Fig. 3c). The total area is the sum of the partial ones (Fig. 3d). In some cases, similar responses to different issues have opposing impact in the subject in consideration. Thus, the contribution of the items with

Fig. 2 Evaluation of the attributes' *Degree of Confidence*



negative impact on the subject in analysis is set as $1/n$ minus the correspondent area, i.e., $(1/n - (k-1)/(k \times n)) = 1/(k \times n)$ for issue 1, $[0, 1/(k \times n)]$ for issue 2 and $[0, 1/n]$ for issue 3.

3 Methods

For this study we used *The Cancer Genome Atlas Glioblastoma Multiforme (TCGA-GBM)* data collection [12]. This image repository is a very large one and, as might be expected, led to the extreme heterogeneity of the image data sets in terms of scanner modalities, manufacturers and acquisition protocols. Thus, one of the difficulties in this project was to find several records on different patients that did not differ much in terms of image, using the same *MR* modality whenever possible. On the other hand an advantage of using this data collection was the presence of documents that contained very useful information about patients (e.g., age, gender, race) and their process (e.g., treatment, follow ups).

The choice of features to be extracted was rather important in a way the patient's outcome may be predicted. Therefore, the starting point of the process consisted in *MRI* brain tumor images in which we could analyze the tumors volume and surface area, as well as edemas' areas and volumes. Besides that, some patient's information was also available such as age, gender, *Karnofsky* score, medications and treatments, as well as the outcomes that will serve as label for the training dataset.

Primarily, the image dataset collected was transferred to *3D Slicer* software in order to proceed to the analysis

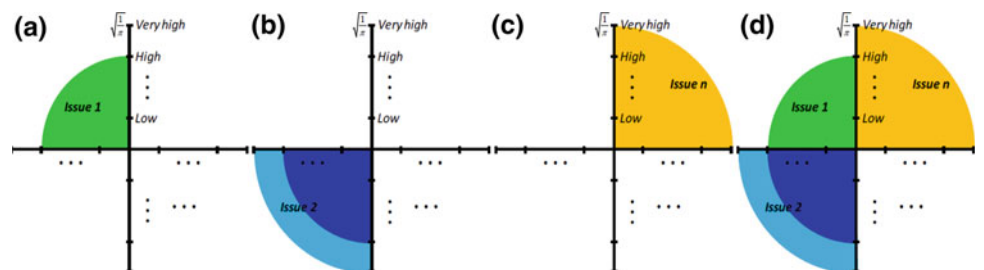
mentioned above (*3D Slicer* is an open source multi-platform software package for visualization and medical image computing, and three-dimensional visualization, widely used in tumor detection) [13, 14]. Therefore, from the time when the dataset is loaded, we were able to work on the axial, sagittal and coronal *2D* views to construct a model of the *Region Of Interest (ROI)* using its *Editor* module. On the other hand, since the most detailed view regarding tumors is the axial (*AX FLAIR*), it was select in order to construct the brain model. For the *ROI's* selection, the main used tool was the *LevelTracingEffect* (Fig. 4), which allowed for the selection of previously labeled structures.

Following the selection mentioned above, the *Surface Models/Model Maker* module was selected in order to create *3D* surface models from the segmented data. A new *Model Maker Parameter Set* was created and an *Input Volume* that is a segmented label map volume was itemized. Besides that, a new *Models* hierarchy was created to provide a structure to contain the return models created from the input volume. Regarding the *Model Maker Parameters*, it was essential to control the type of smoothing on the models, and in this case the *Laplacian Filter* set to the value of 30 was used. Finally, after applying all these changes, it was possible to build the *3D* model visible in the *Models* module as well as the volume and area's estimations, presented in Fig. 5.

4 Case Study

The case study considers the knowledge base given in terms of the extensions of the relations (or tables) depicted in Fig. 6, which stand for a situation where one has to manage information in order to evaluate brain tumor outcome prediction of patients with brain tumors. The *Measurements* table is populated with information from the data set containing features extracted from *MRI* brain images, as explained before. The features involved in the *Measurements* table are *Tumor Volume*, *Tumor Area*, *Edema Volume* and *Edema Area*. It is a two column table given in terms of *General Attributes of Brain Tumor Images*, *Tumor Measurements* and *Edema Measurements*. The table *Patient Information* has as attributes *Age*, *Gender* (Male—M—1, Female—F—0) and the *Karnofsky score*; table *Treatments*

Fig. 3 A view of the qualitative data/information/knowledge processing



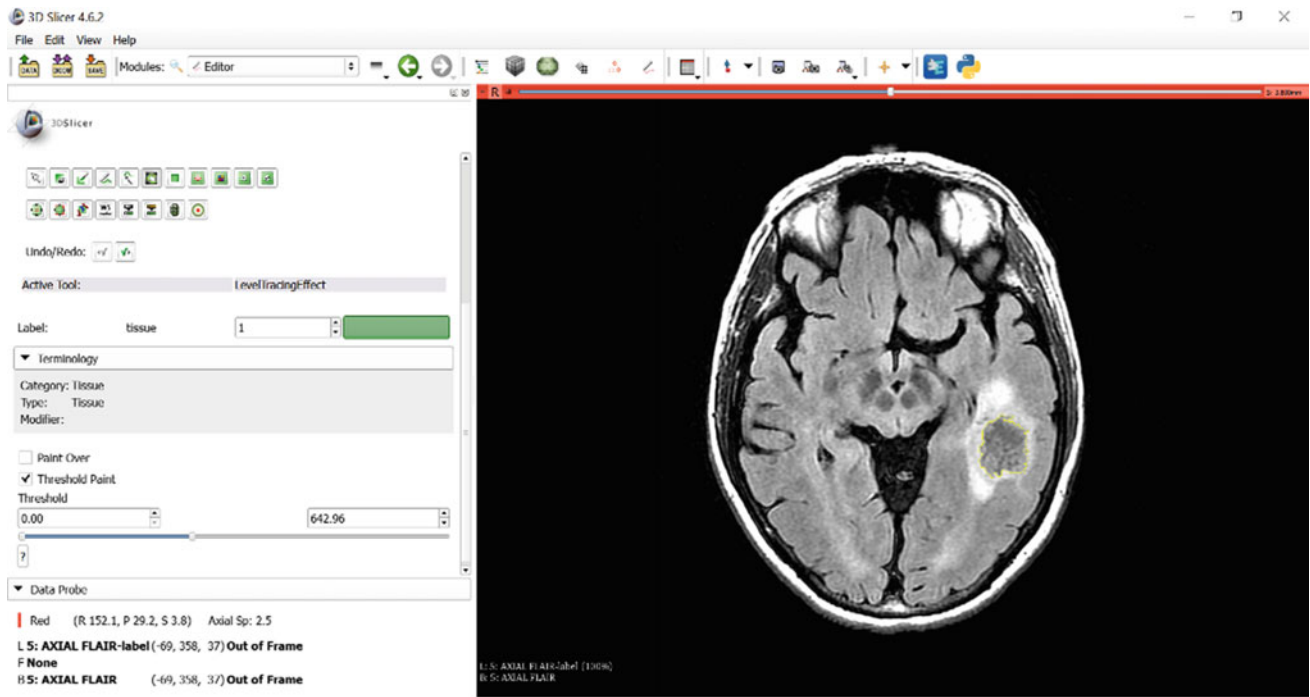


Fig. 4 The outcome of ROI's computation using Editor Module of 3D Slicer

has as attributes *Medication* and *Therapy*. Although the majority of the data present in the tables is known, there is also some incomplete, default and/or unknown (depicted through the symbol \perp) data. It must be noted that, in terms of known data, the *Measurements* table contains solely

quantitative data, whereas the table *Treatments* contains only qualitative one. Each one of the two attributes from the *Treatment* table may fit into two classes, i.e., with regard to the *Medication* attribute, the scale consists of *Temodar*, *Temozolomide*, *Avastin*, *Bevacizumab*, *Gleevac*, whereas for

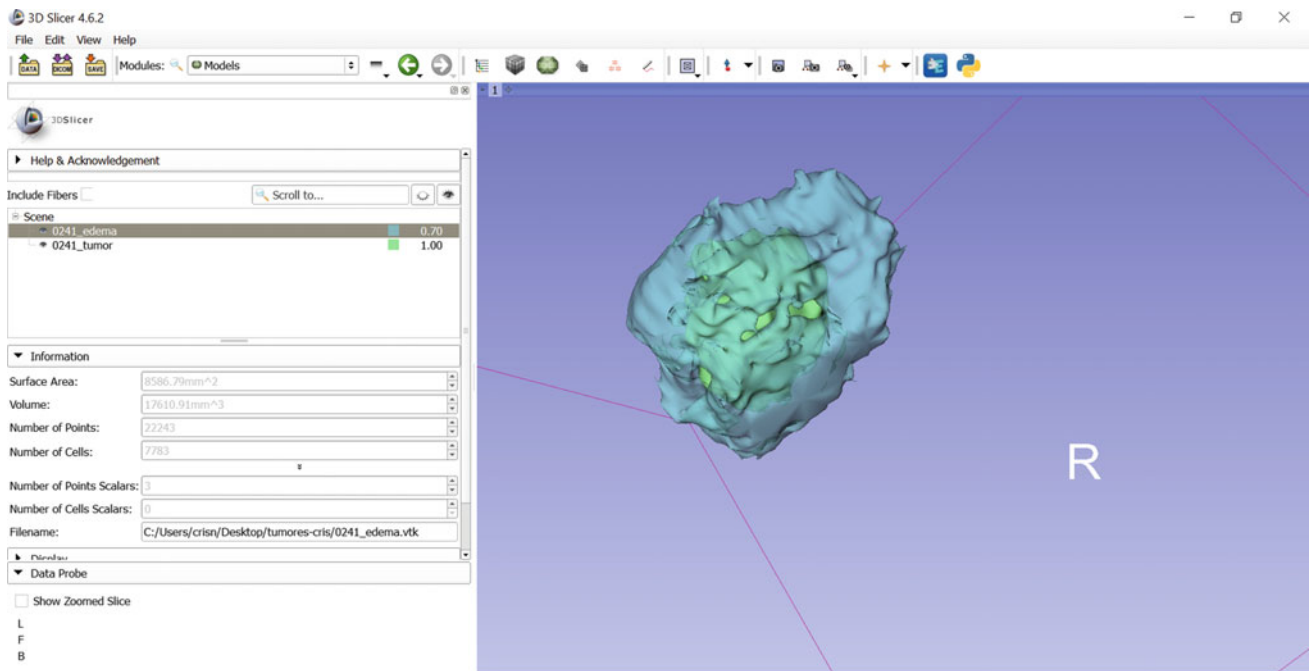


Fig. 5 Volume and Surface area computation using Models Module on 3D Slicer software

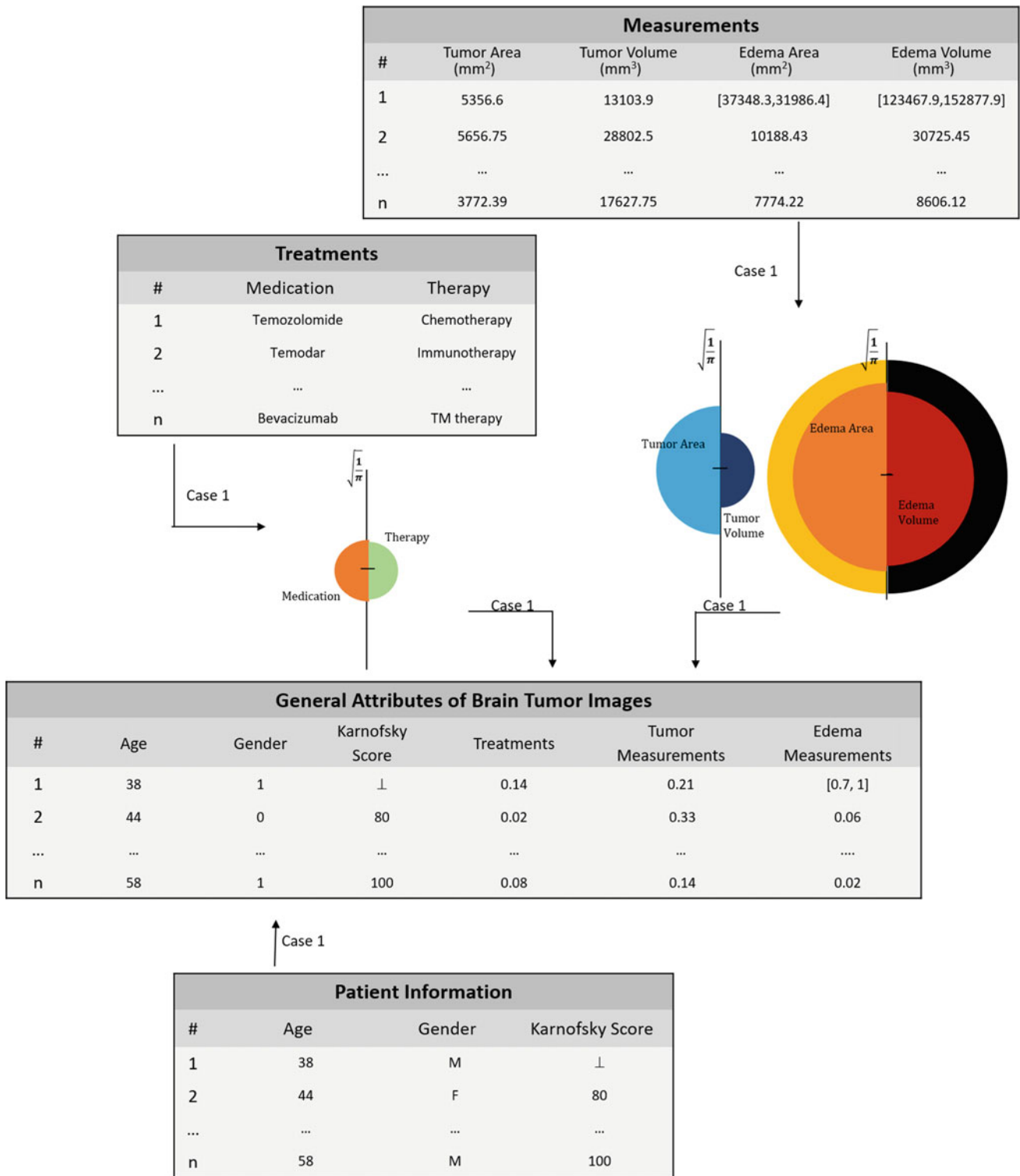


Fig. 6 A knowledge base fragment for *Brain Tumor Outcome Prediction* for patients diagnosed with brain tumors

the the *Therapy* attribute one has *Chemotherapy*, *Immunotherapy* and *Target Molecular Therapy*. Such scales are given in Fig. 7.

In order to quantify the information present in the *Treatments* table the procedures already described above were followed. Applying the algorithm presented in [11] to

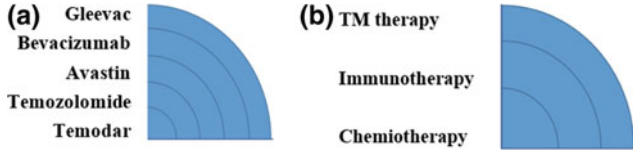


Fig. 7 Qualitative classes on *Medication* (a) and *Therapies* (b) attributes

the table or relation's fields that make the knowledge base for brain tumor outcome prediction for patients with brain tumor (Fig. 6), and looking to the DoC_s values obtained, it is possible to set the arguments of the predicate *patients brain tumor* (pbt), that also describes the objective function with respect to the problem being studied:

$$pbt: Age, Gender, KarnofskyScore, Treatment, TumorMeasures, EdemaMeasures \rightarrow \{0, 1\}$$

where 0 (zero) and 1 (one) denote, respectively, the truth values *false* and *true*.

Applying the algorithm presented in [11] to a term (clause) that presents feature vector $Age = 38$, $Gender = 1$, $KarnofskyScore = \perp$, $Treatment = 0.14$, $TumorMeasures = 0.21$, $EdemaMeasures = [0.7, 1]$, one may get:

$$\{ \neg pbt \left(([A_{Age}, B_{Age}](QoI_{Age}, DoC_{Age})), \dots, ([A_{EM}, B_{EM}](QoI_{EM}, DoC_{EM})) \right) \\ \leftarrow not pbt \left(([A_{Age}, B_{Age}](QoI_{Age}, DoC_{Age})), \dots, ([A_{EM}, B_{EM}](QoI_{EM}, DoC_{EM})) \right) \\ pbt \left(\underbrace{\left(((0.32, 0.32)(1, 1)), \dots, ((0.7, 1)(1, 0.95)) \right)}_{\substack{\text{attribute's values ranges once normalized and} \\ \text{respective QoI and DoC values}}} \right) :: 1 :: 0.83 \\ \underbrace{[0, 1] \quad \dots \quad [0, 1]}_{\substack{\text{attribute's domains} \\ \text{once normalized}}} \\ \} :: 1$$

We are now in a position to use our approach to computing grounded on *Case Based Reasoning* and proceed further with our study.

5 Case Based Reasoning

Case Based Reasoning (CBR) stands for a computing methodology where the act of solving a given problem is based on the consideration of the solutions of similar past ones [15, 16]. Therefore, cases are stored in a cases' repository, and those that are similar (or close) to a new one are used in the problem-solving process (Fig. 8).

Contrasting with other problem-solving strategies (e.g., *Decision Trees* or *Artificial Neural Networks*), relatively

little work is done offline. Undeniably, in almost all the situations the work is performed at query time. The main difference between this approach and the typical *CBR* one relies on the fact that the cases have their arguments set in the range $[0, 1]$, a situation that is complemented with the prospect of handling incomplete, unknown, or even self-contradictory data, information or knowledge. Thus, the classic *CBR* cycle was changed (Fig. 8), being the *Case Base* records given in terms of the pattern:

$$CaseRecords = \{Raw_{data}, Normalized_{data}, Description_{data}\} \quad (4)$$

The $Description_{data}$ field will not be object of attention in this study.

Now, the algorithm given in [11] may be now applied to a new case, that in this study denotes a possible clinical situation of a given patient, here assumed to have the feature vector $Age = 45$, $Gender = 0$, $KarnofskyScore = 73$, $Treatment = \perp$, $TumorMeasures = [0.17, 0.25]$, $EdemaMeasures = 0.73$. One may get:

$$pbt_{newcase} \left(((0.38, 0.38)(1, 1)), \dots, ((0.73, 0.73)(1, 1)) \right) :: 1 \\ :: 0.80$$

The *new case*, in the present form, is now compared with every *retrieved case* from the *Case Base* working a similarity function sim , given in terms of the average of the modulus of the arithmetic difference between the arguments of each case selected and those of the *new case*, with the results [18]:

$$retrieved_{case_1} \left((((0.77, 0.77)(1, 1)), \dots, ((0.25, 0.75)(1, 0.87))) \right) :: 1 :: 0.83 \\ \vdots \\ retrieved_{case_j} \left((((0.69, 0.69)(1, 1)), \dots, ((0.75, 0.82)(1, 0.99))) \right) :: 1 :: 0.81 \\ \underbrace{\hspace{15em}}_{\text{normalized cases that make the retrieved cluster}}$$

Assuming that every attribute has equal weight for the sake of presentation, the $dis(similarity)$, in terms of DoC ,

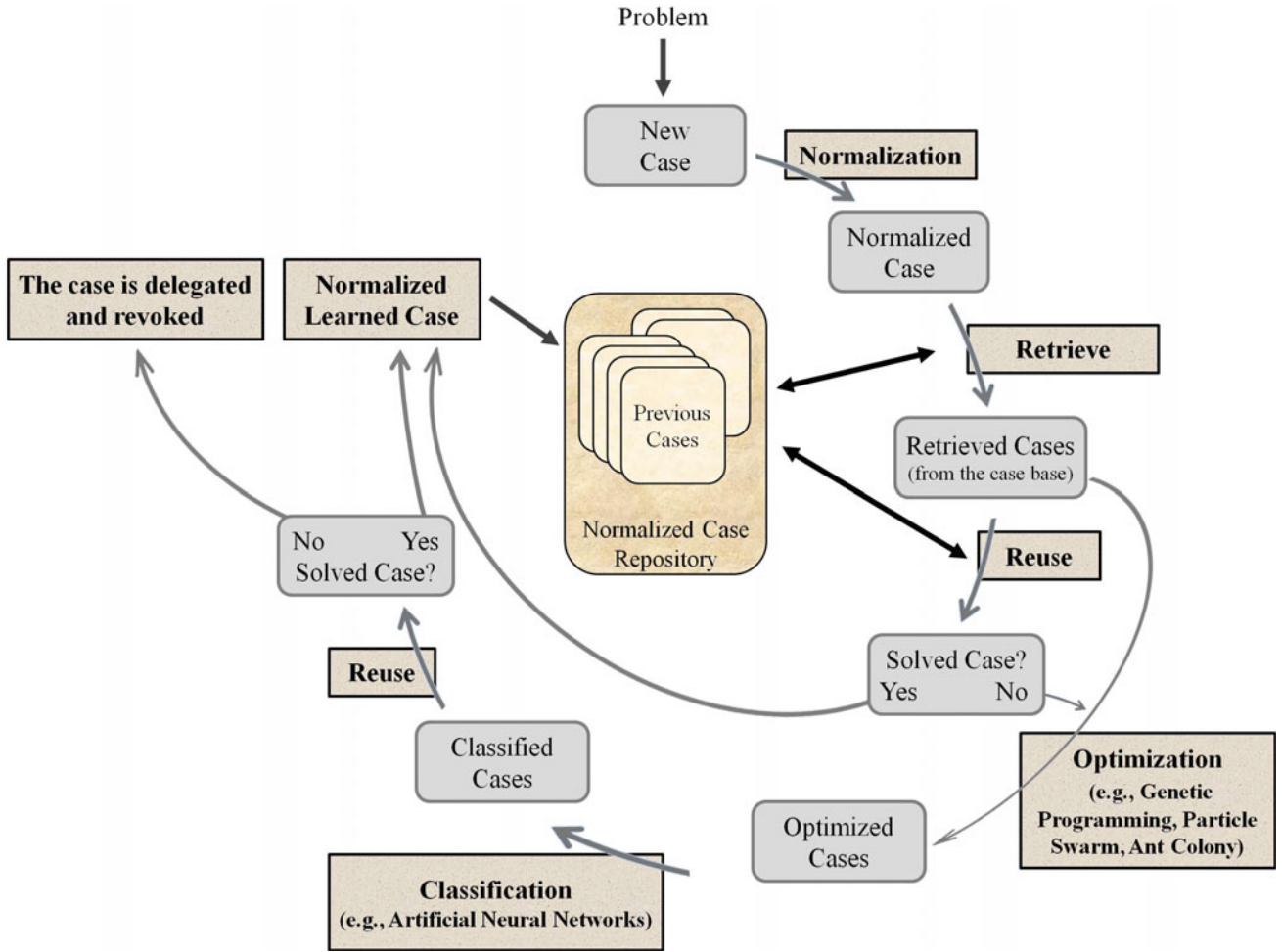


Fig. 8 The extended view of the CBR cycle [17]

between new_{case} and the $retrieved_{case1}$, i.e., $dis_{new\ case \rightarrow 1}^{DoC}$, may be computed as follows:

$$dis_{new\ case \rightarrow 1}^{DoC} = \frac{\|1 - 1\| + \dots + \|1 - 0.87\|}{6} = 0.14$$

Therefore, the *sim(ilarity)*, i.e., $sim_{new\ case \rightarrow 1}^{DoC}$ is set as $1 - 0.14 = 0.86$. Regarding *QoI* the procedure is similar, returning $sim_{new\ case \rightarrow 1}^{QoI} = 1$. Thus, one may have:

$$sim_{new\ case \rightarrow 1}^{QoI, DoC} = 1 \times 0.86 = 0.86$$

These procedures may be extended to all retrieved cases leading to the most similar ones, i.e., the potential solutions to the problem in study. This approach allows users to define the most appropriate similarity methods to address the problem (i.e., it gives the user the possibility to narrow the number of selected cases with the increase of the similarity threshold).

The proposed model was tested on a real data set with 262 cases, and its performance evaluated using the k-folds cross validation technique [19]. In the implementation of the respective dividing procedures, ten executions were performed for each one of them. Table 1 presents the confusion matrix of the CBR model, where the values presented denote the average of 25 (twenty-five) experiments. A perusal to Table 1 shows that the model accuracy was 82.8% (i.e., 217 instances correctly classified in 262). Thus, from clinical practice perspective, the predictions made by the CBR model are satisfactory, attaining accuracies higher than 80%.

Based on the confusion matrix it is possible to compute different metrics in order to evaluate the performance of the model, namely *sensitivity* (83.6%) and *specificity* (81.9%) [20, 21]. It denotes that the one's model exhibits an acceptable performance in the assessment of *Brain Tumor Outcome Prediction*.

Table 1 The *CBR*'s model confusion matrix

Target	Predictive	
	True (1)	False (0)
True (1)	122	24
False (0)	21	95

6 Conclusion

Brain tumor is one of the most aggressive types of cancer in humans, with an estimated median survival time of 12 months where only 4% of the patients surviving more than 5 years after disease diagnosis. We hypothesize that coupling unknown, incomplete or even self-contradictory data or knowledge of brain tumors with objective clinical one might improve predictions of patient survival time and, consequently, better guide for future treatment decisions, i.e., in order to evaluate this hypothesis, the general goal of this research was to build models for *Brain Tumor Outcome Prediction* based either on a new approach to *Knowledge Representation and Reasoning* or *Symbolic Inference* based on a *Mathematical Logic* approach to *Case Based Reasoning*. The model's performance, namely in terms of sensitivity (83.6%) and specificity (81.9%) shows that our model overtakes prediction accuracy of many available ones, surpassing even our best expectations. In addition to the predictive ability, the coupling of qualitative and quantitative functions to rewrite the available data or knowledge into *Extended Logic Programs* according to makings referred to above (Sect. 2), and nomogram techniques, grants high interpretability to the final result.

As future work we intend to look at *Genetic* and *Evolutionary Computation* that in the present days lead to a kaleidoscope of approaches to problem solving that share a common background. In particular, it is intended to approach the problem being stated above from an evolutionary and symbolic perspective in terms of *MRI* data or knowledge, and to propose models to its evaluation on the fly.

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Achieving Cognitive Skills in Multimedia Through Revised Bloom Taxonomy

Reshmy Krishnan

Abstract

Students in middle east are having innovative skills in multimedia and Human Computer Interaction (HCI) and hence self-learning and critical thinking can be enhanced through the teaching of this subject through proper design of the course. To achieve cognitive learning objectives in students, revised bloom taxonomy can be embedded while designing the curriculum. Teaching activities should be aligned to achieve self-learning and critical thinking in students according to the revised bloom taxonomy. Through a Project Based Learning (PBL) method in multimedia and HCI course, the above cognitive learning objectives can be developed in classroom. In this paper the design and practice of a multimedia and HCI curriculum which is taught in Muscat College, Sultanate of Oman is described and demonstrates how cognitive skills are achieved through the embedding of revised bloom taxonomy. The design of the course took the students to the various concepts of graphics techniques and practicals give them the exposure towards realization of those techniques. The final project is developed through the integration of all these practical and tutorial experiences. The observation shows students have applied their creativity with revised bloom taxonomy to obtain the goal in a wonderful way.

Keywords

Revised bloom taxonomy • Project based learning(PBL) • Multimedia • Graphics • Human computer interaction (HCI) • Self-learning • Critical thinking • Cognitive learning

1 Introduction and Background

An educational model known as Blooms Taxonomy [1] was defined in 1956 to categorize objectives in education. In this model the criterions such as knowledge, application, analysis, synthesis and evaluation were considered. In 2001 a modified version of this model was released which focuses dynamic conception of classification rather than the static view of educational objectives.

1.1 Revised Bloom Taxonomy

As per the revised version, categories are considered such as remember, understand, apply, analyze, evaluate and create. When the learner does the processing of tasks such as choose, define, describe, give example, group, know, locate etc.... The remember category will be fulfilled. In assessment, he can write definition, write facts, put label, attend quiz as result of remember. workbook, worksheet, test etc. can be done through the reproduction due to remember. The concepts or ideas can be described is known as understanding. To understand the assessments, questions like” can you write in your own words, what could happen next, what was the main idea etc. can be passed to get the answers. The queries for definition, explanation, example, summary etc. are used to understand the idea of assessments. The next category which is applying the idea can be communicated through the words like practice, produce, solve, show, apply etc. Analyzing is possible with the help of entities such as chart, database, checklist, outline, questionnaire, report, summary etc. in assessments. The following level is the evaluation which can be achieved through the process of checking, experimenting and hypothesizing.

Evaluation level will be followed after analyzing level. In this level a decision or an action is justified through the process checking, experimenting and hypothesizing. The session entitled like conclusion, report, survey,

R. Krishnan (✉)
Department of Computing, Muscat College, Muscat, Oman
e-mail: reshmy_krishnan@yahoo.co.in

recommendation etc. will define evaluation level. This session can be developed through the questions “is there a better solution to...? how would you feel if...? what are the pros and cons of...? how effective are...? etc. The verbs of this session consists of choose, compare, conclude, debate, decide, justify, recommend tell why etc.

All elements are combined in a new method and compiled the information in a different way in the creation level which is the final level of taxonomy. In this level an alternative solution can be proposed or new ideas can be generated, new invention or design can be made. The concepts like blueprint, formula, invention, story board etc. provides the creation level in assessments. The enquiries can be “how would you device your own way...? how many ways can you...? can you see a possible solution to...? can you design a...?, what would happen if...?” etc. The verbs which can constitute the creation level comprised arrange, compose, design, device, formulate, construct etc.

Multimedia and Human computer interaction (HCI) is a vital domain for computer experts and software specialists. The approaches to integrate revised bloom taxonomy with the curriculum of Multimedia and HCI to bridge the gap between the CS specialists and CS educators are presented in this paper. Here various implementations of multimedia and HCI which are there in curriculum and how they are targeting CS educators are discussed [2]. These implementations include module outlines, reference books, tutorial and practical which lead to project ideas. Paper explores how each outline integrates revised bloom taxonomy to recognize Deepness of knowledge to be masters by learners.

In the current approach of multimedia and HCI, psychological guidelines which should be followed in the design of a user interface, technical details in the design, testing details to be covered for evaluation etc. are discussed. The paper points out how the structure of multimedia and HCI curriculum supports computer science (CS) educators to teach a consistent design, evaluation and implementation of both software technology and user interface.

The remainder of this paper is as follows: in the next section we will cover curriculum design of multimedia and HCI courses, in Sect. 2, all aspects of multimedia and HCI teaching using the project based output; this includes educational as well as technical details. In Sect. 3, the effectiveness of our approach is discussed before the conclusion and the future directions in Sect. 4.

1.2 Curriculum Design of Multimedia and HCI Course

Course structure of the course multimedia and HCI consists of the following objectives

- Human computer Interaction concepts and cognitive psychology issues in HCI.
- Requirement of user interface for real time systems.
- Design of user interface with a proper emphasis on the visual aspects of presentation and interaction.
- User testing of an interface.
- Knowledge on standards for representing audio files in computers.
- Knowledge on standards and issues during the implementation of static/dynamic visual input/output on computers.
- Practical experience in multimedia design and implementation.

User Interface

- Motivations for human factors in design: safety-critical systems, industrial and commercial uses, office, home, and entertainment applications.
- The place of human factors, usability and interface design in the software life cycle.
- Adjusting the computing environment to the user (accommodation of human diversity): cognition, perception and physiology.
- Mechanisms of interaction with machines (I/O devices [mouse, keyboard, displays, ...], interaction styles [command line, menus, GUIs, VR]).
- Usability, completeness, consistency: the design of the user interface.
- Evaluating the user interface.
- Usability testing.
- Use of interface design tools.

Graphics

- Colour and the production of colour on graphical output devices.
- Graphical representation and techniques.
- File formats of static and dynamic images: standards, uses, data compression, quality.
- Principles of animation: model design, animation design, production.

Sound

- Auditory input and output: standards and techniques.
- Quality of service and usability in sound.

Multimedia authoring

- Project design: setting up, requirements, navigation, storage, delivery.

- Authoring tools: history, comparison of different approaches, functionality and principles.
- Web-based authoring.
- Applications (e.g. kiosks, distance learning, web-based).

2 Method

Students are required to do individual project for the assignment. The title of the project should be of real time nature. Various phases of projects should be recorded in the report and should be submitted along with the project submission. Report consists of the following contents.

- introduction
- design aspects
 - story boards
 - navigational maps
 - hierarchical task analysis diagram
 - prototype
- usability testing
 - test plan
 - test plan2
 - application usability tests
- references.

In this paper the case study of optical Illusion is described. Optical illusion is an illusion and tricks resulting from the visual confusion and lack of discrimination pictures and be different from the images of nature. Optical illusion visual hallucination happens and affects the visual stimulation causes hallucinations and visual disturbances, cognitive and cause eye diseases and headaches.

Optical illusion known as the interference happens to the headmaster of the image never sees the reality of the image and cannot distinguish them Most of the visual tricks is a fitting pictures next to each other a measured way so as to give the expected results. it automates Optical illusions based on changes colors and lights that interfere with the brain's just a matter of the image where the brain is trying to interpret what the eye sees but gets jammed he cannot describe or refer it's just an illusion. Multiple types of optical illusions with regard to the mismatch in color or geometric shapes and tricks related to moving images and be three-dimensional images and who relate to refrain measurements called deceived "Millar billion."

The optical illusions are one kind of delusion that urges distortions and jamming the five senses. And are hearing and sight and smell and taste and touch, where the five senses are human and sensors that can collect the necessary information as a result of its interaction with its surroundings to help him in various decision-making process. This topic is attracting

to all segments of society. It become shows and displays in a lot of TV channels, even in social media. now there are lots of institutes and colleges that teach student the art of optical illusions. This program is designed for all segments of society, but there are three categories will take care of this subject they are "teenagers, teachers, doctors".

The main objective of the optical illusions program is to attract lightness fun, and joy to the users, and also to help the teacher to make the classroom more fun and entertaining and to attract students' attention to the lesson and participate to solving the questions in new entertaining way. The doctor will use this program to create a new atmosphere and fun for the Patients to help them gets rid of the pain and to attract them to have some fun. This design will meet the needs of the user, it containing a lot of information, such as "introduction of Optical illusions, how Optical illusions work, used in medicine, used in classroom, used in fashion, advantages of Optical illusions, picture, video". These Optical illusions will be presented by multimedia program.

3 Design

3.1 Story Board

Storyboards a sketches tells consecutive events in the form of illustrations, an important element to explain ideas in simple outline, a useful property used by the students to clarify their thoughts within the limits of resources and time available where consists of a combination of text, images, sound and graphics. Storyboards grew up in the film industry to help directors, camera operator to visual film scenes in sequence. Some of the sample story board sketches are shown in Figs. 1, 2, 3 and 4.

3.2 Navigation Maps

A navigation map delineate the structure of the whole web project showing the greater part of the html pages and the associations from one page to others. It is helpful for arranging and plainly perceiving how material ought to be associated. The Navigation Map is like a storyboard, aside from that it doesn't give detail with regards to the substance of the individual pages. The following are a few cases of navigation map (see Fig. 5):

- Linear Structure: The web user explores successively, moving starting with one page then onto the next.
- Hierarchical Structure: Closely resembling the branches of a tree. To move through and through it most move in one time.

Fig. 1 Story board 1

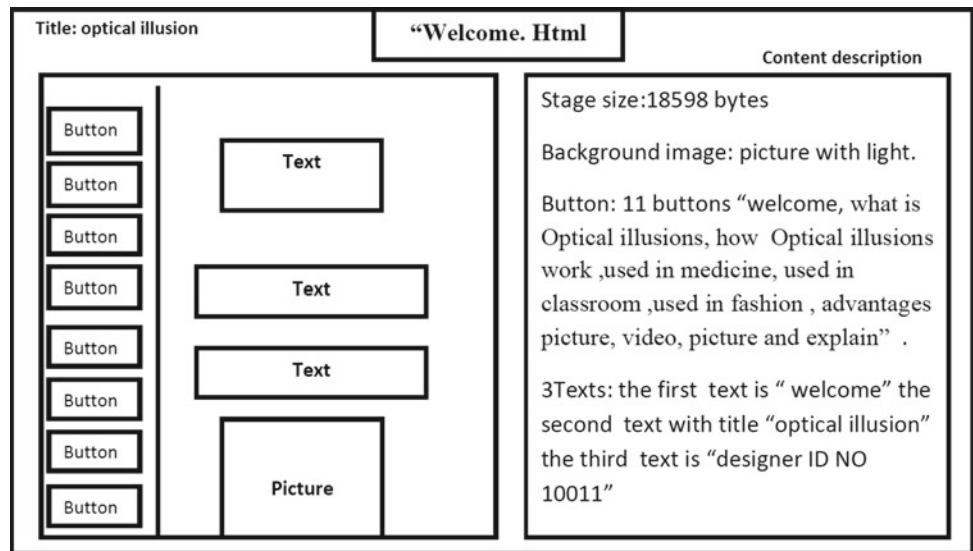


Fig. 2 Story board 2

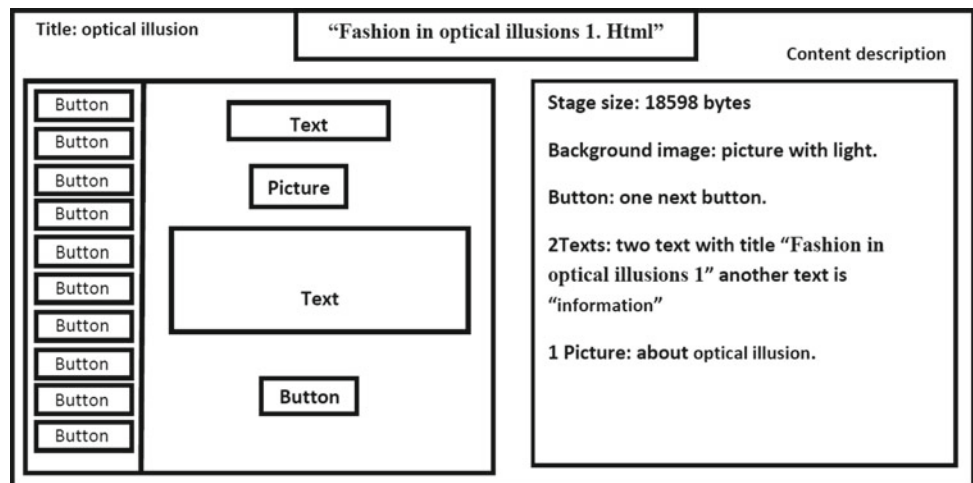
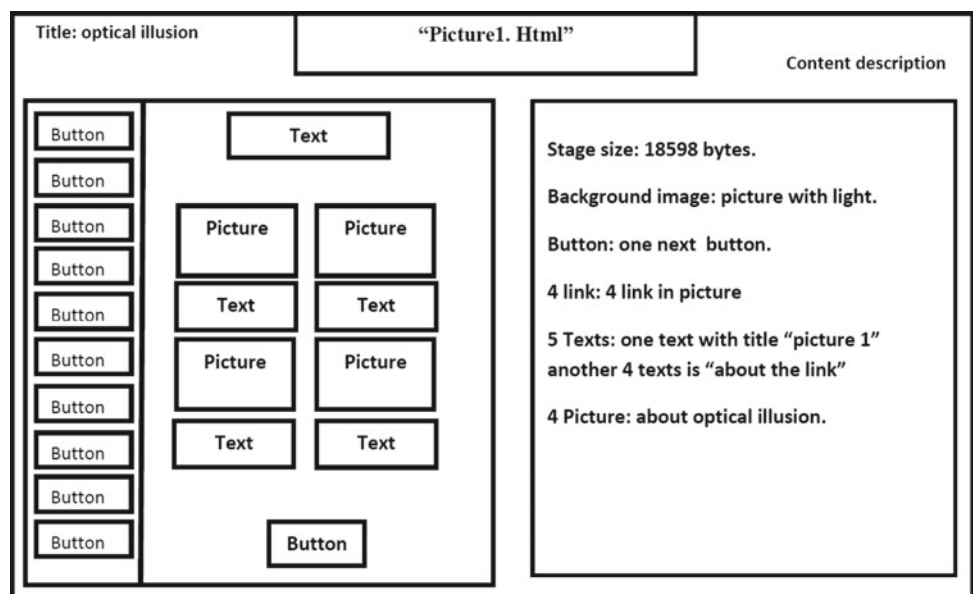


Fig. 3 Story board 3



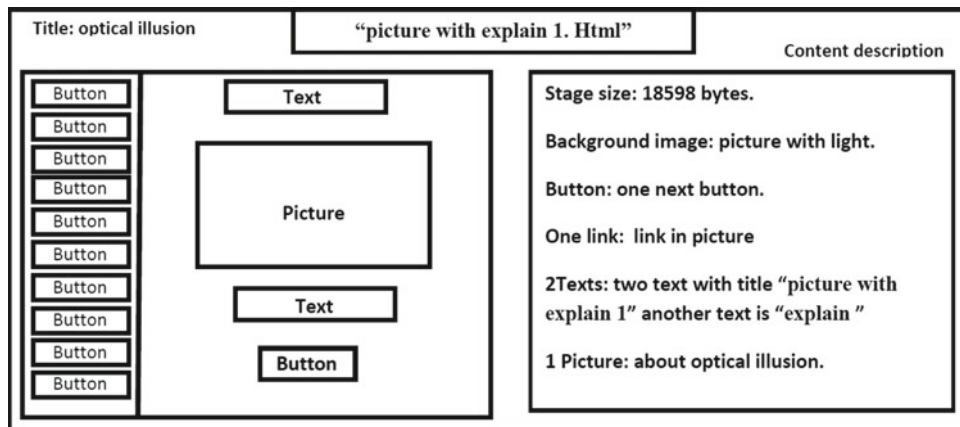


Fig. 4 Story board 4

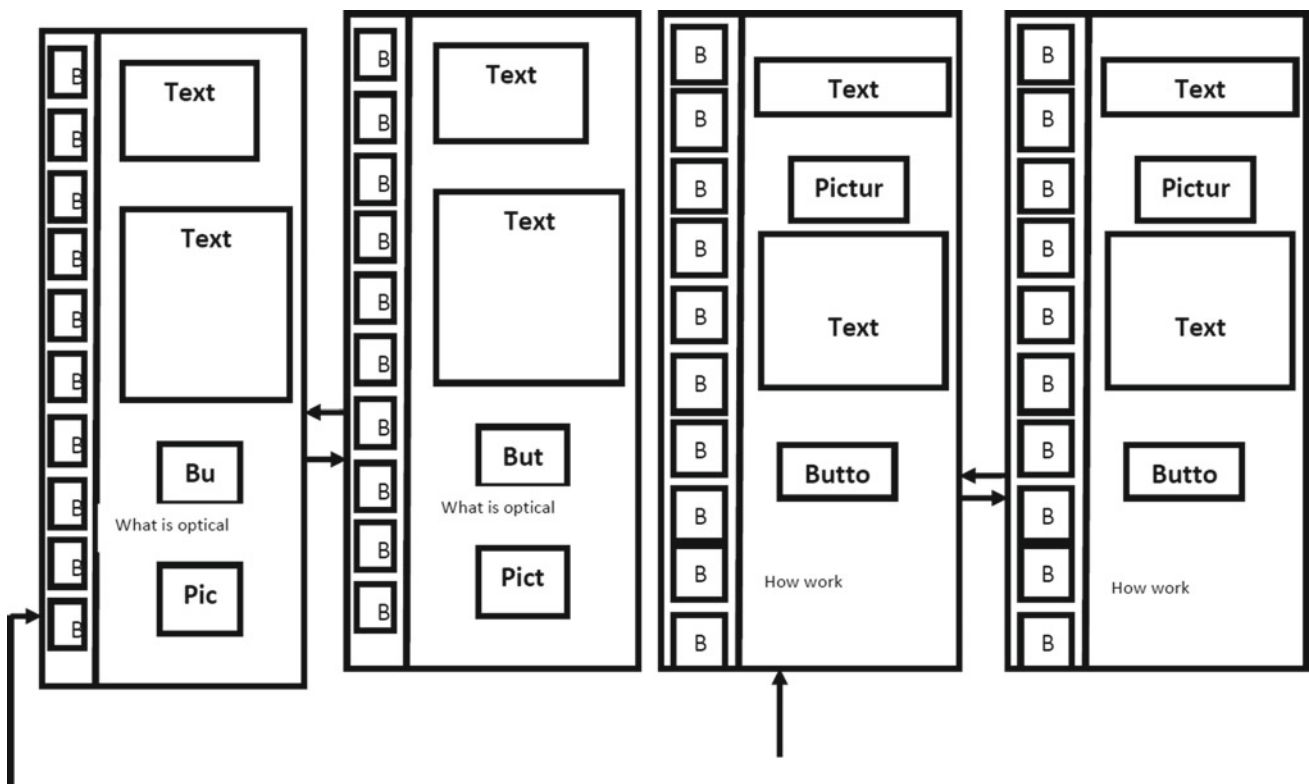


Fig. 5 Navigation map

- Non-Linear Structure: Web clients can explore unre-servedly through the substance of the web extend, unbound by foreordained courses.
- Composite Structure: Generally user can explore unre-servedly (as in the non-linear structure), however are sporadically compelled to a direct or progressive structure for a portion of the material.

3.3 Hierarchical Task

The hierarchical task analysis diagram is shown on Fig. 6. **Prototype.** Optical illusions design is characterized by simplicity design and clarity of the data, that easy design enables the user to access the information which they want. This design is characterized by “Special colors, photos,

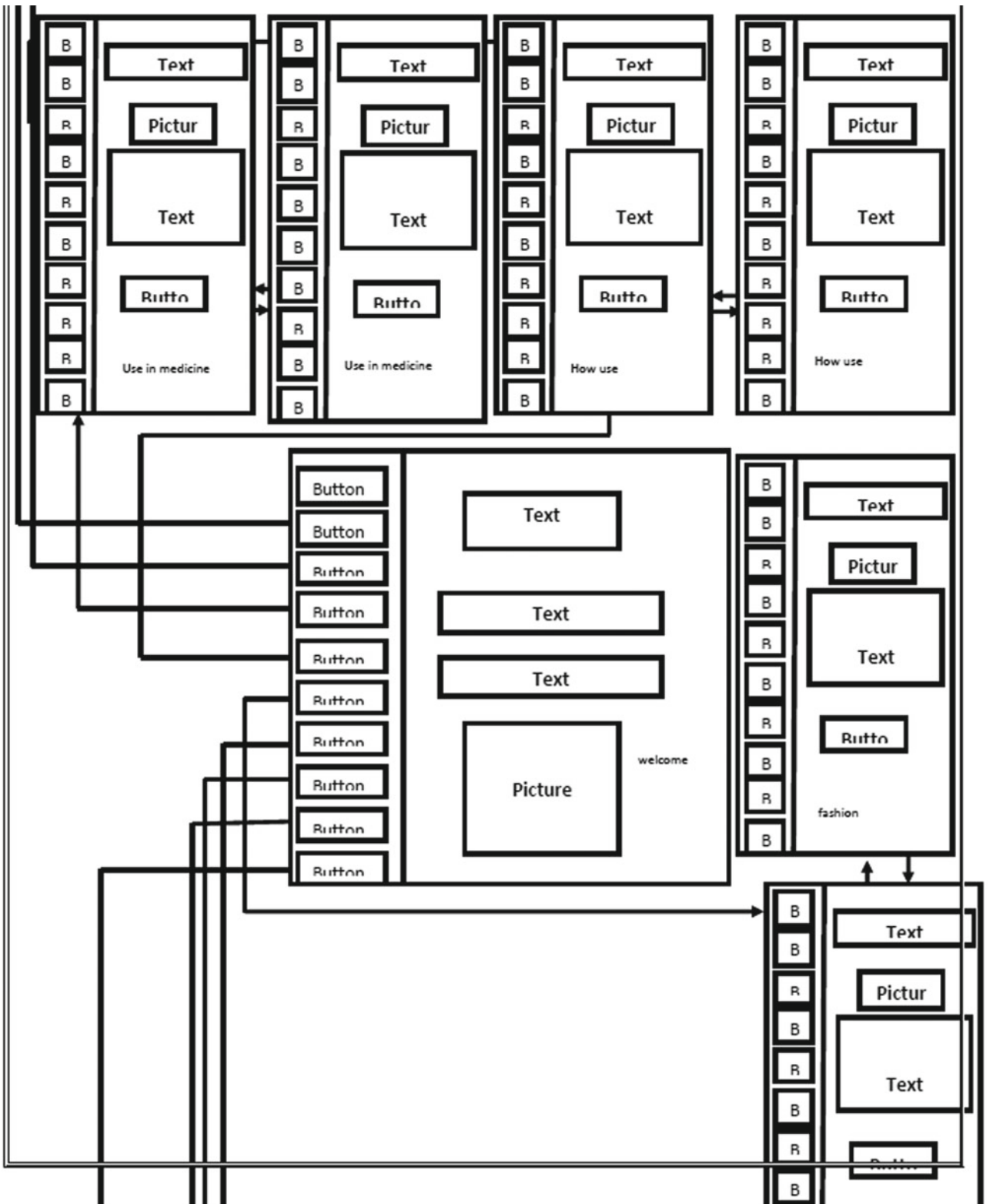


Fig. 5 (continued)

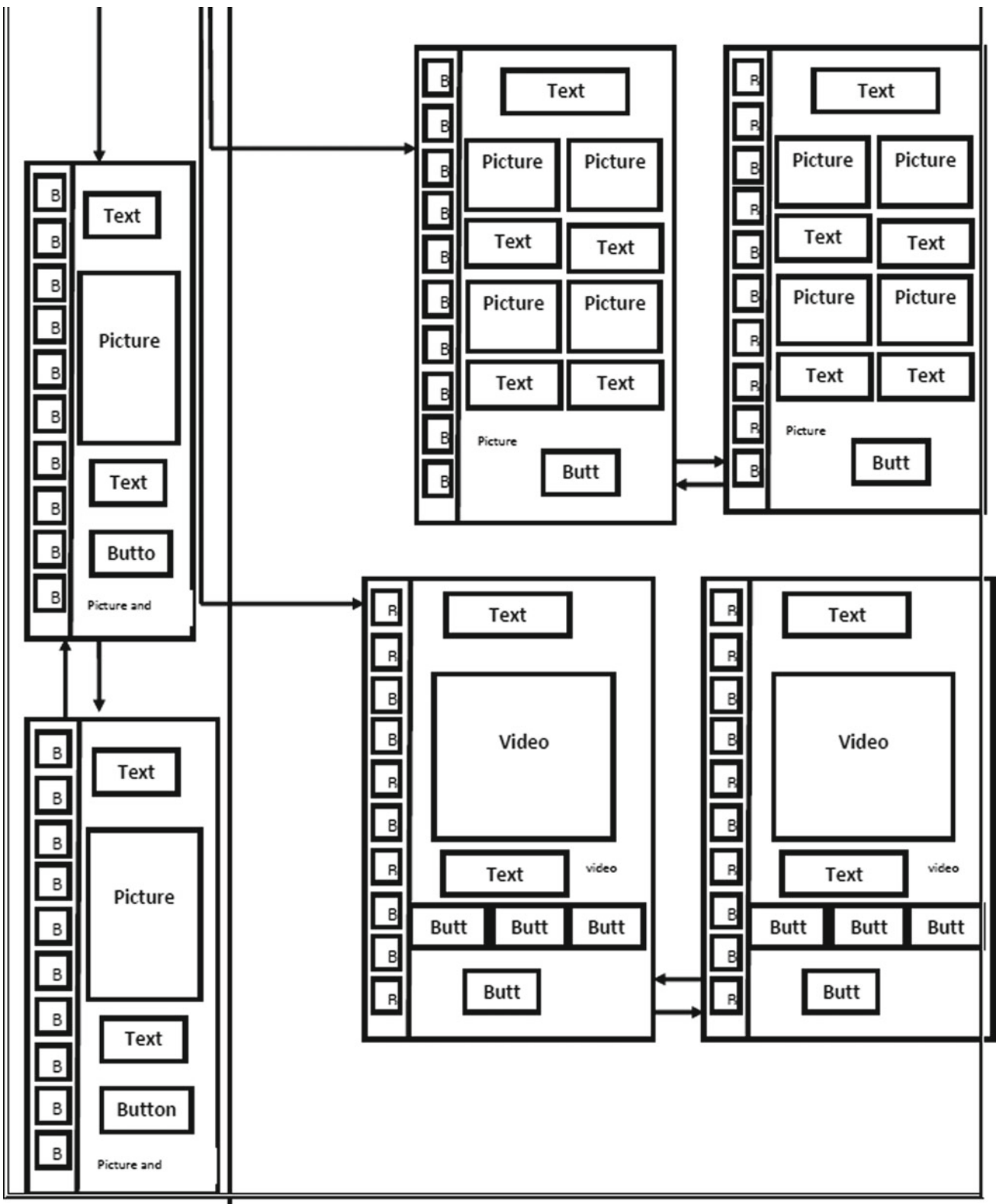


Fig. 5 (continued)

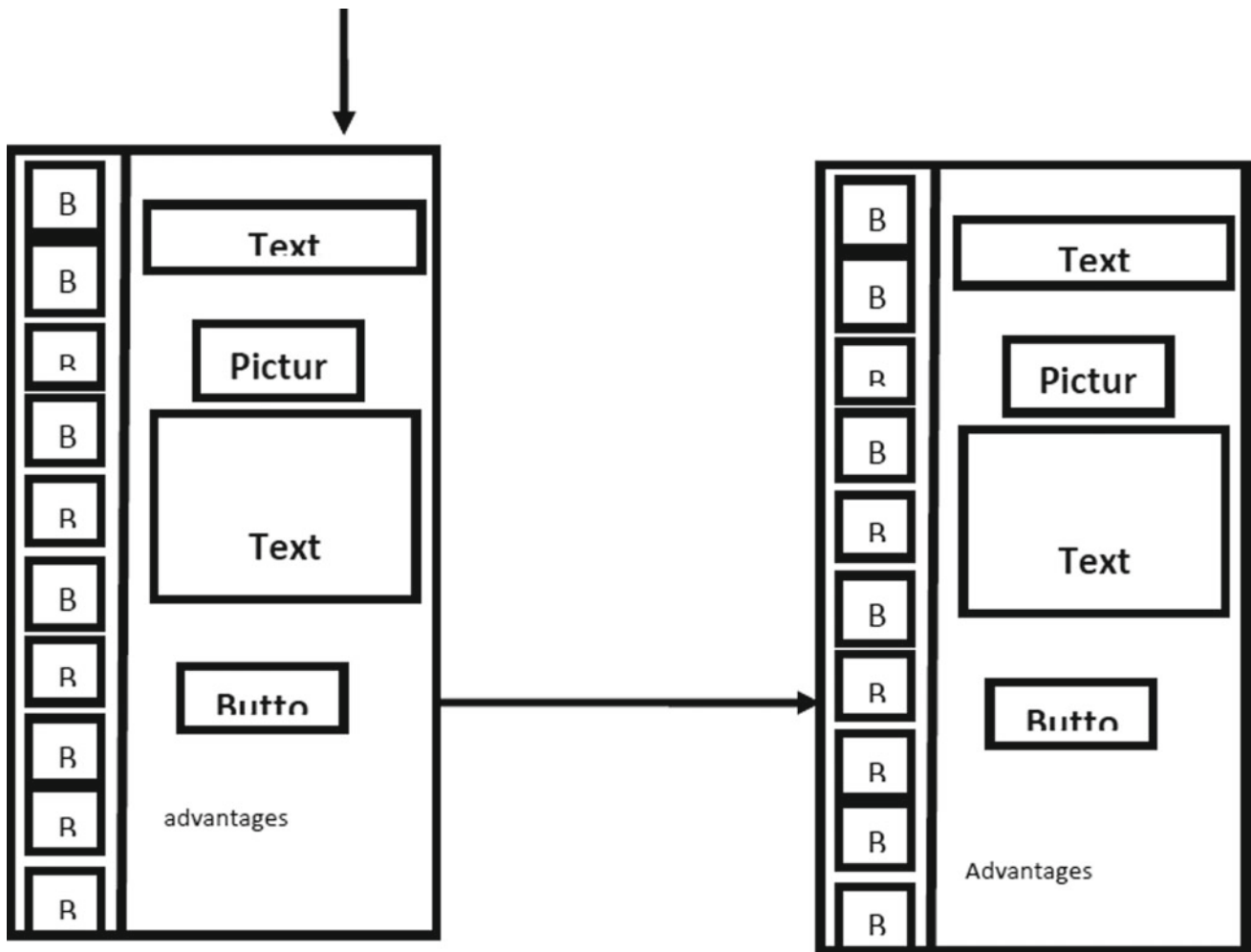


Fig. 5 (continued)

videos, txt and buttons”, that buttons contain the threads that have been developed to this page design. all that Buttons are easy to use by the user; by the way the user can press any button which he want. This design contains buttons which enable the user to go back to the main page it call “back” button. The main objective of this design is to attract the user to using this design. So we taking all the wishes of the user in terms of design, colors and information displayed.

There are a simple difference between prototype and storyboard. In storyboard we have add new buttons, photos and properties, which was not found in the prototype. The prototype contains plans and ideas that we will be Add to the design of the program but when we start planning there are few changes happened to the design format. One of the most positive aspects of the prototype is clarifying the ideas and

plans that the designer will be followed and adds to the design. Prototype making the designer focuses more on the design and arrangement of his thoughts, before starting work for easy access to the design that the user wishes, with high quality. In my opinion there is no negative point for prototype.

4 Usability Testing

The following questions were asked to fill the questionnaire to study the success and the quality of the program. The questions of questionnaire are:

1. do you like the subject of the program?
2. does the colors and background are good for that subject?

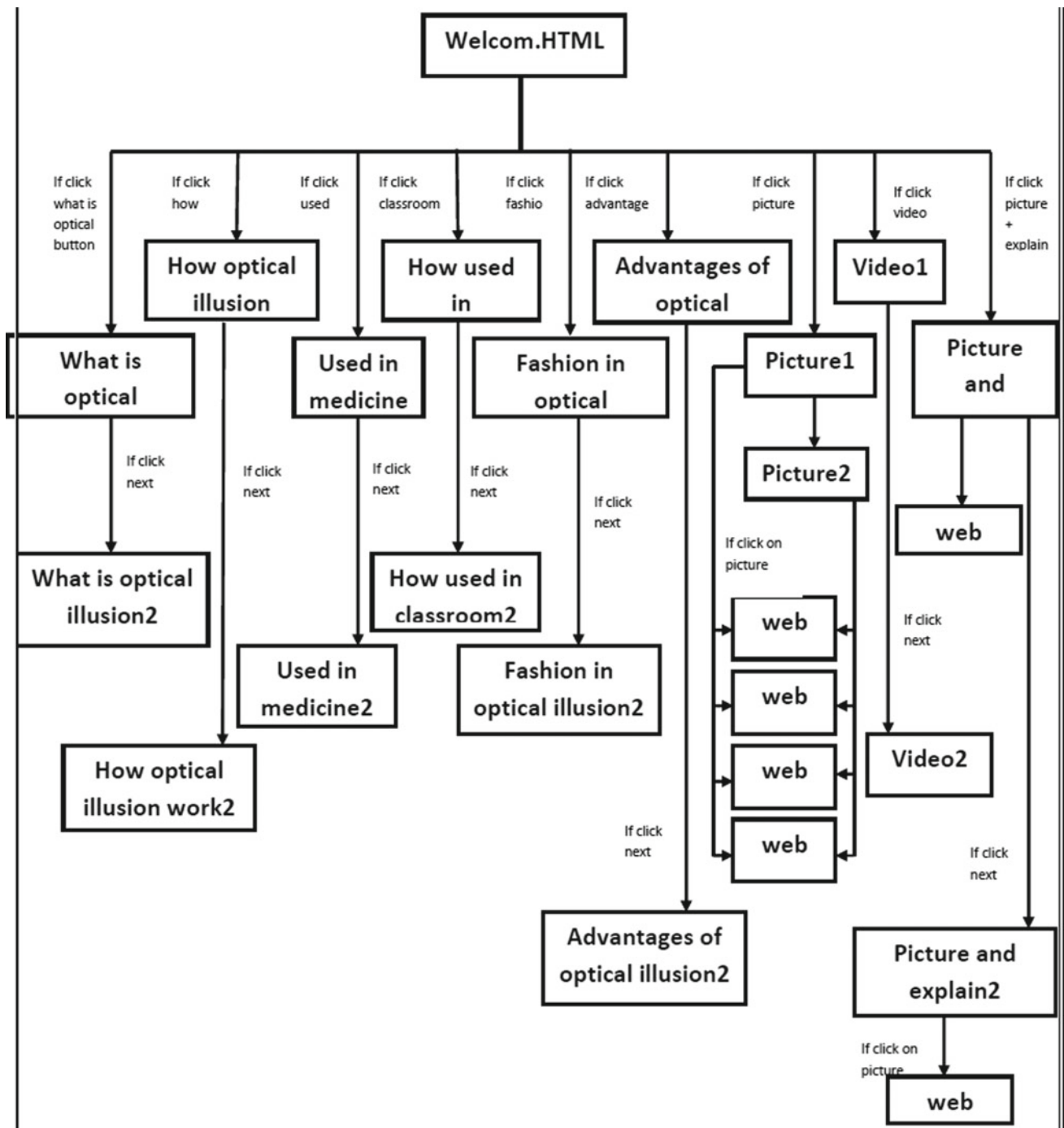


Fig. 6 Hierarchical task

3. Do you get enough information about Optical illusions from that program?
4. can you evaluate the subject and the design?
5. do you this subject can help all people categories?
6. is the video, images and information given enough and purposeful?

The results are shown below:

Questions/result	Yes	No
Questions (1)	14	1
Questions (2)	13	2
Questions (3)	15	0
Questions (4)	15	0
Questions (5)	14	1

The reaction of the users about my program design was excellent.

5 Conclusion and Future Expansion

A project Based Learning approach is presented to teach HCI in computer science education [3]. Knowledge is achieved in the area of HCI through all six levels of the revised blooms taxonomy. The project is prepared from scratch and student is doing each phase systematically as per the taxonomy. Through consistent learning methods such as tutorials, practical, class room discussions student is attaining the outcomes which are motivating the critical thinking of students. This course is highly appreciated by the students of every year due to the simplicity, chance of critical thinking, chance of innovation. In future the course can be

delivered online with more online video tutorials, virtual classes etc. to make a web based teaching of HCI.

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An Estimation for Bitcoin Price Volatility

Murat Akbalık, Melis Zeren, and Ömer Sarıgül

Abstract

According to public opinion cryptocurrencies, especially bitcoin, have been attention taking lately. This can be addressed to the innovative characteristics of blockchain (the basis of the entire digital currency system), namely, the decentralized structure, not using any intermediaries, being anonymous, fast and secure. Being a fluctuating investment tool, the cryptocurrency system exhibits unpredictable ups and downs that make it a speculative asset. This research tries to estimate the bitcoin price volatility using the GARCH model where four different over-the-counter-market data, such as the BITSTAMP, COINBASE, ITBIT, KRAKEN are employed. The results for these four over-the-counter- markets indicate high volatility. Professionals and individuals occupying with bitcoin should take this speculative structure into consideration.

Keywords

Bitcoin • GARCH • Cryptocurrency • Volatility

1 Introduction

According to the public opinion, cryptocurrencies, especially bitcoin, have been attention taking lately. This can be addressed to the innovative characteristics of blockchain (the basis of the entire digital currency system), namely, the decentralized structure, not using any intermediaries, being anonymous, fast and secure. Being a fluctuating investment tool, the cryptocurrency system exhibits unpredictable ups and downs which make it a speculative asset. The hypothesis of this research is to test the price volatility of the bitcoin market components—namely the BITSTAMP, COINBASE,

ITBIT and KRAKEN, which are dealt in bitcoin markets—with Garch model family and find the best fitting Garch model to explain the price volatility. This hypothesis is structured with TGARCH, EGARCH, ARCH models and BITSTAMP, COINBASE, ITBIT and KRAKEN markets are exploited with these models. As far as we are concerned, there are not many researches previously conducted on the four bitcoin markets and our study fills the literature gap related to bitcoin return and volatility estimations. Additionally, this study proposes a proper model for each market component. This is the first and only research reviewing the four markets all together. In the continuation of this research about Bitcoin price volatility, the literature will be evaluated and the methodology will be explained. Following these, the empirical findings will be interpreted. At the conclusion part general evaluations and propositions will be exhibited.

2 Literature Review

The Bitcoin is a network invented in 2009 by a developer nicknamed as Satoshi Nakamoto who now owns a noteworthy fraction of the total Bitcoin treasury. The bearing of certain weaknesses such as difficulties in transportation and maintenance in fiat currency, the distrust in current banking system with heavy fees and regulations necessitated the reinvention of a new monetary system. The Great Recession in 2008 enhanced this mistrust in current financial system further and led the inventors of cryptocurrency to count more on a mathematical process with commonly accepted proofs, transparency and easy portability. The Bitcoin system works on a software called ‘bitcoin protocol’ that processes through an algorithm in bitcoin-mining operation. Basically, bitcoins are continuums beginning with binaries and carrying tails out of blocks composed of numbers and characters. These blocks are coded through the SHA-256 algorithm which obstructs the decoding of the generated bitcoin blocks. Although it is not impossible, the decoding process of the blocked hash is extremely effort requiring since the string to

M. Akbalık (✉) · M. Zeren · Ö. Sarıgül
Marmara University, 34722 Istanbul, Turkey
e-mail: makbalik@marmara.edu.tr

be found to dissolve the hash is very difficult to guess. This is the main reason why bitcoins are quite well-protected against cyberattacks and malicious control gains [1]. The invented bitcoin system carried characteristics such as simplicity, reliability, portability, security and decentralization that made it a preferable system used worldwide.

The bitcoin-mining process requires a highly-qualified hardware system and the corresponding hardware market develops in a continuous manner making new entries to the bitcoin-mining environment incrementally difficult. The development process of the hardware began with Central Processing Unit (CPU), continued with Graphics Processing Unit (GPU) and Field Programmable Gate Arrays (FPGAs) and arrived to an application called Application-Specific Integrated Circuits (ASICs). Amateurs who want to get serious on bitcoin-mining should sacrifice a considerable amount of money to provide the necessary equipment that also implements an effective cooling process since the mining period consumes large amounts of energy. Studies on this area indicate that a 100–500 MW energy consumption is a minimum to discard. This requires a 35–250\$ of minimum spending [2].

When it comes to the price of the bitcoin, although fluctuations exist, there is a steady and rapid increase observable: Being 0.0001\$ in 2009, 0.07\$ in 2010 and 15\$ in 2011, the price of Bitcoin increased to 220\$ in 2015 (was 600\$ in 2014). In 2016 the price raised up to almost 800\$ and finally in 28 August 2017 it was 4343.8\$ [3]. The inevitable and shocking jump of the price in 2017 turned the eyes on the cryptocurrency system, mainly on the most famous component, the Bitcoin. There are also other components, such as the Kraken, Bitstamp, Coinbase and Itbit which have been dealt in markets lately. Governments started to give some thought on the issue and set taxations and regulations newly which are still inadequate. Recent studies show that China broke through last year and made 85% of all the mining operation in 2016, however FBI still retains the most bitcoin number with 144.000 bitcoins. Countries such as USA, Canada, Australia and some European countries accept bitcoin as legal and apply taxation.

The rising number of dealt components in the market as well as the increasing price culminated in an incrementing attention and researchers started to focus on this subject. Although there are some studies covering the bitcoin prices, volume and volatility as well as the necessary energy consumption and the real value of Bitcoin, there are not many studies focusing on Bitcoin. For example, Eng-Tuck Cheah and John Fry investigated bitcoin prices and found speculative bubbles. According to their calculations, the price of a bitcoin seems to be zero in fact [4]. However, there are arguments that

bitcoin gains value through the mining process that counts on a reliable mathematical computing continuum. Further arguments suggest that bitcoin is more like an asset than a currency since the transaction period starts from eight months on average indicating to a less liquidity. Dwyer suggests that bitcoin should contain specialties such as being a means of payment and store of value for being assumed as a currency and bitcoins have positive value due to the limited number and innovative characteristic [5]. Van Alstyne suggests that in order to be counted as a currency bitcoin must be subject to taxation and regulations [6]. Furthermore, [7] examines available GARCH methods to be used to compute volatility in bitcoin prices. He compares 6 different GARCH models and found that AR-CGARCH model is the most appropriate one to calculate and predict price volatility in bitcoin markets. In addition to these studies, [8] try to predict bitcoin returns and volatility by using a nonparametric causality method that works in quantile intervals. Consequently, they find that volume can predict returns if market system does not work in a bear and bull regime, but that volume does not predict volatility under any circumstances.

Table 1 is a summary of recent researches in a chronological order.

3 Data and Methodology

Our data is obtained from Bloomberg databank. To provide time range uniformity between different bitcoin markets obtained from Bloomberg data terminal, we took the time interval between 11.12.2013–23.08.2017 which corresponds to a total of 1376 observations. The returns are calculated by taking logarithm to the base ten. To sum the model: P_t corresponds the discrete bitcoin price process and y_t refers to the process of continuously compounded returns, defined as $y_t = 100 \log(P_t/P_{t-1})$.

The first-order GARCH modelv [7]:

$$R_t = c + \sum_{i=1}^s \phi R_{t-i} + u_t \quad (1)$$

$$u_t = h_t z_t, z_t \sim \text{i.i.d}(0, 1) \quad (2)$$

where R_t is the bitcoin price return on day t , u_t is the error term, z_t is the white noise process and h_t is the conditional standard deviation.

To check the stationarity, we applied the unit root tests and also ARCH test has been checked out. Consequently, unit root and ARCH tests revealed smooth results, so there was no necessity for a correction to run ARCH family models (Tables 2 and 3).

Table 1 Chronologically ordered Bitcoin research literature

Researcher	Date	Topic	Research theme
Bradbury [1]	November 2013	The problem with bitcoin	In his article Danny Bradbury talks about the brief history of cryptocurrency system, how bitcoin works, the danger of cyberattacks on bitcoin accounts, mitigating factors that impede these attacks, required hardware supports for coin-mining, double spending attempts that use one fixed bitcoin address without paying any penalty, dust transactions that manipulate the network to gain advantage and code-based attacks
Dwyer [5]	2014	The economics of bitcoin and similar private digital currencies	The paper argues that used technologies and quantity limitation of Bitcoin generates a positive value. Dwyer goes further with mentioning the innovative characteristic of bitcoin and the limitation put forward by cryptocurrency to government's revenue gained from inflation
Cheah and Fry [4]	2015	Speculative bubbles in Bitcoin markets? An empirical investigation into the fundamental value of Bitcoin	This paper investigates the working of bitcoin prices. According to the economic and econometric modelling the study undertakes, Bitcoin demonstrates speculative bubbles and the groundwork of Bitcoin is actually zero
Katsiampa [7]	2017	Volatility estimation for Bitcoin: a comparison of GARCH models	The research examines the six GARCH models (AR-GARCH, AR-EGARCH, AR-TGARCH, AR-APARCH, AR-CGARCH and AR-ACGARCH) and tries to find which one of them is appropriate to calculate the Bitcoin price. Results show that AR-CGARCH model fits best to predict the Bitcoin price
Balçilar et al. [8]	2017	Can volume predict Bitcoin returns and volatility? A quantiles-based approach	The study tries to estimate the relationship between volume and volatility in bitcoin bid-ask process employing a non-parametric causality test that works on quantiles. Results exhibit that prediction methods that use linear interrelation are not able to predict volume-return or volume-volatility relationship. And nonlinear models can only predict volume-return relationship in a certain quantile interval whereas cannot estimate volume-volatility interrelation even at a confidence level of 0.10
Vranken [2]	2017	Sustainability of bitcoin and blockchains	The study emphasizes the energy consumption during bitcoin-mining process and the improvements in bitcoin hardware. It also refers to the alternative less energy demanding procedures and different blockchain applications. Results show that bitcoin-mining hardware market is in a continuous development (CPU, GPU, FPGA, ASIC) and an average consumption of energy for the mining process is 100–500 MW

4 Empirical Results

To estimate bitcoin volatility, we employed the ARCH model with the smallest Akaike criterion (3.4896) among ARCH/GARCH model family (GARCH, TGARCH, EGARCH, ARCH) (Table 4). To provide estimation robustness three diagnostic tests have been put in use: As a result of the implemented autocorrelation test, ARCH model, with a probability bigger than 5%, did not reveal an autocorrelation problem (Table 5). The heteroscedasticity test

(ARCH LM test) applied to the residuals of the ARCH model showed a Chi-square probability value bigger than 5% and confirmed the assumption that there is no heteroscedasticity problem (Table 6). The Jarque-Bera diagnostic test with a probability smaller than 5% indicated that the data is not normally distributed. However, a distribution other than normality is not considered as a big problem by most of the scientists, so our model can be assumed as acceptable (Table 7).

ARCH model was again the best fitting model with the smallest Akaike criterion (3, 3.5299) among ARCH/GARCH

model family (GARCH, TGARCH, EGARCH, ARCH) for Coinbase (Table 4). The same results for all the 3 diagnostic tests have been found for Coinbase (Tables 6, 7 and 8).

For ITBIT, the best fitting model was the EGARCH model with the smallest Akaike criterion (3.4543) among all other ARCH/GARCH family members (Table 4). The same results for all the 3 diagnostic tests have been found for Itbit (Tables 6, 7 and 9).

For Kraken, the best fitted model have been found as the GARCH model with the smallest Akaike criterion value of 3.6620 (Table 4). As a result of the implemented autocorrelation test, GARCH model, with a probability bigger than 5%, did not reveal an autocorrelation problem (Table 10). The ARCH LM test applied to the residuals of the GARCH model showed a p -value smaller than 5%, but the difference was a small number as 0.0436, so the heteroscedasticity found in the residuals can be counted as ignorable (Table 6). The Jarque-Bera diagnostic test with a probability smaller than 5% indicated that the data is not normally distributed (Table 7).

Our results, proposing the appropriateness of the usage of ARCH/GARCH model family, match with the findings of [7] who suggests the application of the ARCH/GARCH model family to estimate bitcoin volatility.

5 Conclusion

Having registered a tremendous price jump between 2015 and 2017, the bitcoin market became the luminous investment tool most investors buy into. The price being 600\$ in 2016 increased unexpectedly to 4300\$ and gathered interest by both individual and professional investors. This increasing attention and curiosity about this continuum of bitcoin

prices necessitated scientific researches that explain the price path and volatility trends to enlighten investors decision process. The few number of the researches made until now unfortunately doesn't inform the investor sufficiently. Our research is aimed to fill the gap of available literature and to show a way for estimating the price volatility to ensure a healthier decision process. We considered four bitcoin markets, namely the Bitstamp, Coinbase, Itbit and Kraken. Conclusively, we showed that the best fitting model to estimate the price volatility of Bitstamp and Coinbase is ARCH model, for Itbit the EGARCH model and for Kraken the GARCH model. This research proposes the potential investor to be careful when investing in bitcoin because the bitcoin market is a highly speculative market and the ups and downs are mostly unpredictable.

We almost every day encounter news about bitcoin in the printed and visual press. These news are generally about bitcoin prices reaching historical record levels or news concerning governments such as China, firms such as JPMorgan Chase&Co forbidding bitcoin transactions. Interlacing positive and negative news cause a total chaos in the public opinion. In this research, confirming the previous studies, we find that the bitcoin price volatility is too high and that the bitcoin investors are under considerable risk. According to the Theory of Finance, a high risk can cause both an opportunity to high return and a possibility for a big loss. As a saying in Turkish explains well, things may not go as planned and can go farther and fare worse.

Appendix

See Tables 2, 3, 4, 5, 6, 7, 8, 9 and 10.

Table 2 Unit root test (Augmented Dickey-Fuller test) for Bitstamp, Coinbase, Itbit and Kraken

	Bitstamp		Coinbase		Itbit		Kraken	
	t-statistic	Prob.*	t-statistic	Prob.*	t-statistic	Prob.*	t-statistic	Prob.*
Augmented Dickey-Fuller test statistic	-38.33492	0.0000	-30.28516	0.0000	-37.63707	0.0000	-40.14521	0.0000
Test critical values: 5% level	-3.434896		-3.434900		-3.434896		-3.434896	
Test critical values: 1% level	-2.863435		-2.863437		-2.863435		-2.863435	
Test critical values: 10% level	-2.567828		-2.567829		-2.567828		-2.567828	

Table 3 Heteroscedasticity tests (ARCH-LM TEST) for Bitstamp, Coinbase, Itbit and Kraken (before ARCH model)

Bitstamp		Coinbase			Itbit			Kraken							
F-statistic	224.5828	Prob. F (1,1.373)	0.0000	F-statistic	171.3255	Prob. F (1,1.373)	0.0000	F-statistic	148.1816	Prob. F (1,1.373)	0.0000	F-statistic	146.9738	Prob. F (1,1.373)	0.0000
Obs*R-squared	193.2928	Prob. Chi-square(1)	0.0000	Obs*R-squared	152.5408	Prob. Chi-square(1)	0.0000	Obs*R-squared	133.9418	Prob. Chi-square(1)	0.0000	Obs*R-squared	132.9555	Prob. Chi-square(1)	0.0000

Table 4 ARCH family models for Bitstamp, Coinbase, Itbit and Kraken

ARCH model for Bitstamp				ARCH model for Coinbase				EGARCH model for Itbit				GARCH model for Kraken			
Variable	Coefficient	z-statistic	Prob.	Variable	Coefficient	z-statistic	Prob.	Variable	Coefficient	z-statistic	Prob.	Variable	Coefficient	z-statistic	Prob.
C	0.049220	1.603872	0.1087	C	0.045282	1.450246	0.1470	C	0.072402	0.028050	0.0098	C	0.055940	1.785688	0.0741
Variance equation				Variance equation				Variance equation				Variance equation			
C	0.017547	5.429093	0.0000	C	0.027401	6.099418	0.0000	C(2)	-0.208310	-19.42584	0.0000	C	0.031150	6.153480	0.0000
RESID(-1)^2	0.214404	8.784657	0.0000	RESID(-1)^2	0.312275	11.36306	0.0000	C(3)	0.334691	18.86034	0.0000	RESID(-1)^2	0.132286	14.13533	0.0000
GARCH(-1)	0.899314	138.4707	0.0000	GARCH(-1)	0.889532	102.3604	0.0000	C(4)	0.018406	1.845557	0.0650	GARCH(-1)	0.872255	129.5074	0.0000
Akaike info criterion	3.489571			Akaike info criterion	3.529965			C(5)	0.964266	228.8614	0.0000	Akaike info criterion	3.662037		
								Akaike info criterion	3.454384						

Table 5 Bitstamp's ARCH model (autocorrelation test-correlogram of standardized residuals squared) (diagnostic tests)

Autocorrelation	Partial correlation		AC	PAC	Q-Stat	Prob*
		1	0.015	0.015	0.3024	0.582
		2	-0.009	-0.009	0.4191	0.811
		3	-0.020	-0.019	0.9584	0.811
		4	-0.002	-0.001	0.9625	0.915
		5	0.010	0.010	1.0997	0.954
		6	0.017	0.016	1.5071	0.959
		7	0.004	0.004	1.5326	0.981
		8	-0.002	-0.002	1.5391	0.992
		9	0.014	0.015	1.8289	0.994
		10	-0.005	-0.005	1.8595	0.997
		11	0.011	0.011	2.0216	0.998
		12	-0.037	-0.037	3.8807	0.985
		13	-0.025	-0.024	4.7337	0.981
		14	0.044	0.044	7.4043	0.918
		15	0.049	0.046	10.738	0.771
		16	-0.018	-0.020	11.192	0.797
		17	-0.035	-0.032	12.896	0.743
		18	-0.011	-0.007	13.053	0.788
		19	0.005	0.005	13.092	0.834
		20	0.006	0.002	13.147	0.871
		21	-0.017	-0.019	13.563	0.888
		22	-0.062	-0.060	18.889	0.652
		23	-0.052	-0.050	22.631	0.482
		24	0.032	0.031	24.049	0.459
		25	0.001	-0.004	24.050	0.516
		26	-0.027	-0.027	25.070	0.515
		27	-0.021	-0.012	25.662	0.537
		28	-0.041	-0.038	27.998	0.465
		29	0.003	-0.003	28.007	0.518
		30	-0.020	-0.024	28.558	0.541
		31	0.029	0.034	29.730	0.531
		32	-0.035	-0.031	31.453	0.494
		33	-0.036	-0.037	33.273	0.454
		34	-0.022	-0.026	33.985	0.468
		35	0.052	0.047	37.790	0.343
		36	-0.015	-0.010	38.088	0.375

Sample: 1 1376

Included observations: 1376

*Probabilities may not be valid for this equation specification

Table 6 ARCH model (heteroscedasticity Test-ARCH-LM TEST) for Bitstamp, Coinbase, Itbit and Kraken (diagnostic tests)

	Bitstamp			Coinbase			Itbit			Kraken				
F-statistic	0.301219	Prob. F (1,1373)	0.5832	F-statistic	0.001424	Prob. F (1,1373)	0.9699	F-statistic	2.970920	Prob. F (1,1373)	0.0850	F-statistic	4.078664	Prob. F (1,1373)
Obs:*R-squared	0.301592	Prob. Chi-square(1)	0.5829	Obs:*R-squared	0.001426	Prob. Chi-square(1)	0.9699	Obs:*R-squared	2.968823	Prob. Chi-square(1)	0.0849	Obs:*R-squared	4.072507	Prob. Chi-square(1)

Table 7 Normality test (The Jarque-Bera) test for Bitstamp, Coinbase, Itbit and Kraken (diagnostic tests)

	Bitstamp	Coinbase	Itbit	Kraken
Sample	1376	1376	1376	1376
Observation	1376	1376	1376	1376
Mean	0.010101	0.012977	-0.007683	0.008054
Median	0.012145	0.021575	0.006420	0.012859
Maximum	5.420216	5.470050	5.957258	5.264484
Minimum	-6.362480	-5.383607	-5.44319	-5.442547
Std. Dev.	1,002718	1.000935	1.000704	1.002040
Skewness	-0.254473	-0.139188	-0.176210	-0.302074
Kurtosis	7.339379	6.978251	7.205250	7.053634
Jarque-Bera	1094.450	911.8279	1021.011	963.0246
Probability	0.000000	0.000000	0.000000	0.000000

Table 8 Coinbase's ARCH model (autocorrelation Test- correlogram of standardized residuals squared) (diagnostic tests)

Autocorrelation	Partial correlation		AC	PAC	Q-Stat	Prob*
		1	-0.001	-0.001	0.0014	0.970
		2	-0.019	-0.019	0.4933	0.781
		3	-0.010	-0.010	0.6262	0.890
		4	0.002	0.001	0.6294	0.960
		5	0.012	0.011	0.8226	0.976
		6	0.003	0.003	0.8388	0.991
		7	-0.001	-0.001	0.8415	0.997
		8	0.005	0.005	0.8762	0.999
		9	0.007	0.007	0.9461	1.000
		10	0.008	0.008	1.0428	1.000
		11	0.024	0.025	1.8677	0.999
		12	-0.030	-0.029	3.1099	0.995
		13	-0.025	-0.024	3.9485	0.992
		14	0.009	0.008	4.0543	0.995
		15	0.059	0.057	8.8583	0.885
		16	-0.024	-0.024	9.6486	0.884
		17	-0.030	-0.028	10.909	0.861
		18	0.018	0.019	11.353	0.879
		19	-0.005	-0.007	11.388	0.910
		20	0.002	0.000	11.392	0.935
		21	-0.020	-0.019	11.928	0.942
		22	-0.060	-0.060	17.037	0.761
		23	-0.041	-0.042	19.409	0.677
		24	-0.015	-0.018	19.731	0.712
		25	0.015	0.011	20.061	0.744
		26	-0.018	-0.022	20.531	0.766
		27	-0.035	-0.029	22.221	0.726
		28	-0.052	-0.050	26.028	0.572

(continued)

Table 8 (continued)

Autocorrelation	Partial correlation		AC	PAC	Q-Stat	Prob*
		29	0.008	0.002	26.113	0.619
		30	-0.010	-0.015	26.263	0.662
		31	-0.001	0.004	26.264	0.709
		32	-0.029	-0.024	27.420	0.698
		33	-0.027	-0.028	28.443	0.694
		34	-0.021	-0.024	29.074	0.708
		35	0.009	0.005	29.186	0.744
		36	0.013	0.012	29.434	0.772

Sample: 1 1376

Included observations: 1376

*Probabilities may not be valid for this equation specification

Table 9 Itbit's EGARCH model (autocorrelation test—correlogram of standardized residuals squared) (diagnostic tests)

Autocorrelation	Partial correlation		AC	PAC	Q-Stat	Prob*
		1	0.046	0.046	2.9771	0.084
		2	-0.008	-0.010	3.0709	0.215
		3	-0.028	-0.027	4.1206	0.249
		4	-0.026	-0.023	5.0376	0.283
		5	0.015	0.017	5.3535	0.374
		6	-0.014	-0.017	5.6231	0.467
		7	-0.012	-0.012	5.8391	0.559
		8	-0.015	-0.014	6.1430	0.631
		9	0.034	0.035	7.7281	0.562
		10	-0.004	-0.009	7.7525	0.653
		11	-0.003	-0.003	7.7658	0.734
		12	-0.040	-0.038	9.9545	0.620
		13	-0.032	-0.027	11.366	0.580
*	*	14	0.079	0.079	19.947	0.132
		15	0.072	0.063	27.082	0.028
		16	-0.015	-0.024	27.405	0.037
		17	-0.026	-0.020	28.371	0.041
		18	0.007	0.014	28.432	0.056
		19	-0.015	-0.018	28.756	0.070
		20	0.001	-0.001	28.758	0.093
		21	-0.008	-0.003	28.841	0.118
		22	-0.057	-0.052	33.374	0.057
		23	-0.041	-0.043	35.735	0.044
		24	0.003	0.001	35.745	0.058
		25	0.020	0.016	36.283	0.067
		26	-0.012	-0.013	36.498	0.083
		27	-0.037	-0.029	38.454	0.071
		28	-0.035	-0.034	40.134	0.064
		29	0.008	-0.005	40.227	0.080

(continued)

Table 9 (continued)

Autocorrelation	Partial correlation		AC	PAC	Q-Stat	Prob*
		30	-0.005	-0.012	40.267	0.100
		31	0.000	0.007	40.267	0.123
		32	-0.016	-0.015	40.610	0.141
		33	-0.022	-0.023	41.312	0.152
		34	-0.025	-0.030	42.213	0.157
		35	0.000	-0.004	42.214	0.187
		36	-0.002	0.003	42.220	0.220

Sample: 1 1376

Included observations: 1376

*Probabilities may not be valid for this equation specification

Table 10 Kraken's GARCH model (autocorrelation Test—correlogram of standardized residuals squared) (diagnostic tests)

Autocorrelation	Partial correlation		AC	PAC	Q-Stat	Prob*
		1	0.054	0.054	4.0840	0.043
		2	-0.011	-0.014	4.2572	0.119
		3	-0.029	-0.027	5.4003	0.145
		4	-0.033	-0.030	6.9063	0.141
		5	-0.010	-0.007	7.0312	0.218
		6	-0.008	-0.009	7.1296	0.309
		7	-0.024	-0.025	7.9148	0.340
		8	-0.002	-0.001	7.9193	0.441
		9	0.004	0.002	7.9375	0.540
		10	-0.028	-0.031	9.0347	0.529
		11	-0.009	-0.008	9.1564	0.607
		12	-0.010	-0.011	9.3056	0.677
		13	-0.008	-0.009	9.3937	0.743
		14	0.038	0.036	11.445	0.651
*	*	15	0.113	0.108	29.127	0.015
		16	-0.018	-0.031	29.588	0.020
		17	-0.014	-0.010	29.879	0.027
		18	-0.002	0.007	29.882	0.039
		19	-0.001	0.004	29.885	0.053
		20	0.006	0.005	29.940	0.071
		21	-0.018	-0.017	30.398	0.084
		22	-0.051	-0.045	34.011	0.049
		23	-0.020	-0.018	34.579	0.057
		24	0.020	0.021	35.144	0.066
		25	0.011	0.012	35.304	0.083
		26	-0.017	-0.021	35.689	0.098
		27	-0.014	-0.012	35.975	0.116
		28	-0.040	-0.040	38.240	0.094
		29	0.008	0.002	38.336	0.115
		30	0.018	0.005	38.780	0.131
		31	-0.023	-0.020	39.501	0.141

(continued)

Table 10 (continued)

Autocorrelation	Partial correlation		AC	PAC	Q-Stat	Prob*
		32	-0.010	-0.011	39.640	0.166
		33	-0.018	-0.021	40.074	0.185
		34	-0.018	-0.019	40.535	0.204
		35	0.003	0.001	40.551	0.239
		36	-0.010	-0.006	40.687	0.272

Sample: 1 1376

Included observations: 1376

*Probabilities may not be valid for this equation specification

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An Optimization Model for Solving Stochastic Cooperative Games

Assem Tharwat[✉], Marwa Sabry, and Ihab El-Khodary[✉]

Abstract

This paper introduces an optimization model for a new class of cooperative games arising from cooperative decision making problems in a stochastic environment. This class of games considers cooperative games in stochastic characteristic function form (stochastic pay-offs). In this type of games, the players only know probability distribution of the stochastic payoffs and the actions available for a coalition to choose from are explicitly modelled as opposed to the deterministic games. In this model, the core of the game is not empty, where the solution allocation vector of the corresponding payoff is preferable over any other allocation. The proposed model is applied to the Gaussian valued cooperative games.

Keywords

Cooperative games • Stochastic • Gaussian • Fuzzy • Coalition

1 Introduction

The world of game theory is often divided into two branches: cooperative game theory and non-cooperative game theory. This classification is based mainly on whether or not players can form binding agreements (coalitions) before the game. Consequently, the problem here is how to divide the

earnings (or cost savings) among the members of the formed coalition. There are many practical scenarios where a group or coalition of connected agents operates in an environment in which they seek to maximize their individual utilities as a rational microeconomic goal, and yet need to cooperate to share risks, costs, or revenues. Cooperative game theory finds many applications in supply chain cooperation [1, 2], facility location [3], and logistics [4, 5]. In the fields of economics and business, cooperative games have been used to set insurance premiums [6] and interchange fees for ATM bank networks [7].

In conventional cooperative game theory, the worth that can be attained by coalitions are known with certainty, and the solution concepts seek to determine allocations of this total worth to the players, even the payoffs that the players obtain from a solution are also free of uncertainty. However, in reality, agents may not have complete information about the expected worth of their coalitions where the payoff to each coalition is a random quantity represented only through probability distributions.

As such, imprecision of information in decision making problems of cooperative game theory has been addressed in the literature through a stochastic framework. In stochastic cooperative games, the payoff values are often estimations or approximations of reality. Under a stochastic environment, the value of the grand coalition, i.e., the total profit (or cost) is not given. Therefore, any distribution of some deterministic payoff among the players will not be efficient in general and the payoffs will not sum up to the actual coalitional worth. Ideally, we would like to have a payoff distribution scheme that is stable and fair given the uncertainty in the characteristic function. The game with stochastic payoffs is distinguished from a deterministic game by two major differences. The first one is that the payoffs can be random variables, which is not allowed in the deterministic case. The other, is that in a game with stochastic payoffs the actions that a coalition can choose from are explicitly modeled which is not the case in the deterministic game. As such, in real decision making situations, decisions are always done

A. Tharwat (✉)

College of Business Administration, American University in the Emirates, Dubai, UAE
e-mail: assem.tharwat@aeu.ae

M. Sabry · I. El-Khodary

Faculty of Computers and Information, Cairo University, Giza, Egypt
e-mail: m.sabry@fci-cu.edu.eg

I. El-Khodary

e-mail: e.elkhodary@fci-cu.edu.eg

on the basis of vague information or uncertain data. For such decision making problems, there exist two typical approaches involving uncertainty: probability-theoretic approach and fuzzy-theoretic one [8].

The aim of this paper, is proposing a stochastic multi-objective optimization model that is capable of solving stochastic cooperative games. It provides a solution allocation vector for the cooperating players of coalition S of the corresponding stochastic coalitional worth. This model is applied for Gaussian coalitional games and uses the chance constrained programming technique to convert the stochastic programming problem into a non-linear deterministic one, and then a fuzzy programming approach is applied to find the optimal compromise solution for the multi-objective model.

2 Literature Review

Many attempts in the literature have been done for dealing with the stochastic variations. The Shapley value [9] is a solution concept for cooperative TU games for which several equivalent formulations exist. The Shapley value is introduced in an axiomatic way, that is, the solution fulfills a set of defined axioms. The basic idea: consider all possible orders for the players to enter the game and compute each player's average marginal contribution over these orders. Therefore, the Shapley value can be seen as assuming particular way of cooperative dynamics: start from the empty coalition and add player after player until the grand coalition is reached.

Suijs in [10] considered cooperative games with stochastic payoffs, the model introduced by Suijs explicitly incorporates preferences on stochastic payoffs for each agent and allows each coalition to choose from several actions.

Suijs [11] continued on his first model. They extended the definitions of super-additivity and convexity for TU games to stochastic cooperative games.

Suijs [11] considered formulations of the Shapley value but was not able to extend it to his model of stochastic cooperative games because, among others, a marginal vector of a stochastic cooperative game need not be uniquely defined.

Timmer et al. [12], developed three solution concepts for cooperative games with random payoffs inspired by the equivalent formulations of the Shapley value for TU games which are, the marginal value, the dividend value and the selector value. They studied the properties of these solution concepts and gave two characterizations on subclasses of games. The first one is on the class of games where all players have identical preferences of a specific 'linear' type. On this class of games with random payoffs the three

solution concepts coincide. The second one is a characterization on the class of one-person and two-person games, where again the three solutions coincide.

Ma et al. [13], took the model introduced by Suijs et al. [10] as a basis, gave the definition of marginal vector to the stochastic cooperative games and defined the Shapley value for this kind of games.

Doan & Nguyen [8], redefined the concept of stability in a stochastic setting and introduced new concepts for robust payoff distribution among the players in such a way to ensure the stability of the game. They considered stochastic games where the uncertainty is captured and represented through the stochastic payoff functions. Their method, however, departs from other existing methods in the way they modeled the uncertainty and the corresponding definition of the stochastic games as well as the solution concepts. Specifically, they used robust optimization approaches and modeled the uncertainty of the characteristic function through an uncertainty set. This uncertainty set could be as simple as an interval for the payoff value of a coalition or as complicated as the set of probability distribution of some random factors. They introduced the concepts of robust imputation and robust core (and least core) and showed that the computation of a robust core (and least core) is equivalent to computing the core of a deterministic game.

However, their model was capable of computing robust payoff distribution in classes of stochastic games when the number of players was of a reasonable size.

3 The Model and Methodology

In this section, a general framework to model stochastic cooperative games is introduced. Our research work associated the uncertainties through stochastic payoff functions regarded as realization of some random variables $\tilde{v}(s)$ with known distribution functions [14]

$$F_{\tilde{v}(s)}(x) = P\{\tilde{v}(s) \leq x\},$$

and the stability criteria are maintained by preserving the imputation set of constraints.

The classical cooperative games need to be modified in such a way that a factor of randomness in values of characteristic function could be taken into account. Thus under stochastic cooperative game (SCG), the pair of sets $SCG = (I, \tilde{v})$ is used, where

- $I = \{1 \dots n\}$: is the set of players;
- $\tilde{v}(S)$: random variables with determined density functions $P_{\tilde{v}(s)}(x)$, which are interpreted as incomes (worth) of coalitions $S \subset I$.

3.1 Stochastic Representation of the Game

Now, possible approaches to determine allocations in stochastic cooperative games are explained in a more detailed way.

In a classical cooperative game (I, v) the allocation vector (payoff vector) $X \in R^n$, where $n = I$ and satisfies the following conditions, to be an imputation vector:

$$(i) \quad x_i \geq v(\{i\}) \quad \text{for } i = 1, 2, \dots, I \quad \textbf{Individual Rationality} \quad (1)$$

$$(ii) \quad \sum_{i=1}^I x_i = v(I) \quad \textbf{Group Rationality} \quad (2)$$

In case of stochastic cooperative games, to create an analogue for the conditions of group and individual rationality, this will be based on the requirement of satisfaction of these conditions for a certain level of probability α . Thus an allocation payoff vector in a stochastic cooperative games could be defined as a vector $X(\alpha) \in R^n$, satisfying the following conditions:

$$(i) \quad Pr\{x_i(\alpha) \geq \tilde{v}(i)\} \geq 1 - \alpha \quad \text{for } i = 1, 2, \dots, I \quad \textbf{Individual Rationality} \quad (3)$$

$$(ii) \quad Pr\left\{\sum_{i=1}^I x_i(\alpha) \leq \tilde{v}(I)\right\} \geq 1 - \alpha \quad \textbf{Group Rationality} \quad (4)$$

Here, condition (3) guarantees that the percentage, prescribed by the allocation $X(\alpha)$ to the i -th player has to exceed the value of a random variable of his individual payoff with a probability not less than $(1 - \alpha)$. Condition (4) can be interpreted in a way that the worth gained by grand coalition is enough to perform an allocation $X(\alpha)$.

We will consider some certain aspects of transition from classical cooperative games with transferable utility to their stochastic ones. In general, we should determine a technology of transition from deterministic worth $v(I)$ to stochastic worth $\tilde{v}(I)$. As such, a realistic situation in which $\tilde{v}(I)$ can be considered to be normally distributed random variables.

$$\tilde{v}(I) \sim N(v(I), \sigma_I^2)$$

Thus switching from deterministic to stochastic models is logical by adding variances σ_I^2 to the values of the characteristic function $v(I)$, which are represented by mean values. After this procedure the coalitional worth become stochastic.

Of course, for our general research, the hypothesis that values $\tilde{v}(I)$ are normally distributed is initially quite controversial because of a universal and typical nature of this continuous distribution.

3.2 Multi-Objective Stochastic Model

All players of coalition S cooperate together to maximize their profit, and since the problem contains random variable coefficients, definitions and solution methods for ordinary mathematical programming problems cannot be directly applied. Consequently, we handle the constraints as chance constrained conditions [15], which mean that the constraints need to be satisfied with a certain probability (satisfying level) and over. Thus, a multi-objective chance constrained programming model can be formulated for any coalition with stochastic worth as follows:

$$\text{Max} \quad x_1(\alpha), x_2(\alpha), \dots, x_i(\alpha) \quad (5)$$

Subject to

$$Pr\{x_i(\alpha) \geq \tilde{v}(i)\} \geq 1 - \alpha \quad i = 1, \dots, I \quad (6)$$

$$Pr\left\{\sum_{i=1}^I x_i(\alpha) \leq \tilde{v}(I)\right\} \geq 1 - \alpha \quad (7)$$

$$x_i \geq 0 \quad i = 1, \dots, I \quad (8)$$

Where, Pr indicates the probabilistically defined constraints, $X(\alpha)$ is the payoff (imputation) vector such that $x_i(\alpha)$ is the expected payoff of player i , and $\tilde{v}(I)$ are independent normally distributed random variables with known means and variances. α is the satisfying probability level $0 \leq \alpha \leq 1$.

Converting the probabilistic defined constraints of (6–7) into their equivalent deterministic ones [16], could be written as follows:

$$x_i(\alpha) - B_i \sigma[\tilde{v}(i)] \geq E[\tilde{v}(i)], \quad i = 1, \dots, I \quad (9)$$

Where, $E[\tilde{v}(i)]$ and $\sigma[\tilde{v}(i)]$ is the mean and standard deviation of the normal random variable $\tilde{v}(i)$, and B_i is the inverse cumulative distribution function of the standard normal random variable $\tilde{v}(i)$.

$$\sum_{i=1}^I x_i(\alpha) - \delta \sigma[\tilde{v}(I)] \leq E[\tilde{v}(I)] \quad (10)$$

Where, $E[\tilde{v}(I)]$ and $\sigma[\tilde{v}(I)]$ is the mean and standard deviation of the normal random variable $\tilde{v}(I)$, and δ is the inverse cumulative distribution function of the standard normal random variable $\tilde{v}(I)$.

To ensure the convergence of the transformed equivalent deterministic model, the following convergence constraints are concluded from the fact that,

$$\varphi(B_i) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{B_i} \exp\left(-\frac{z^2}{2}\right) dz \quad (11)$$

And let

$$\varphi(B_i) = y_i \quad (12)$$

Expanding the above integral of (11) and simplifying it will results in an incomplete gamma function and Eq. (12) could be rewritten as:

$$\sum_{r=0}^{\infty} \frac{B_i^{(2r+1)}}{\prod_{n=0}^r (2n+1)} = \sqrt{\frac{\pi}{2}} (2y_i + 1) \exp\left(\frac{B_i^2}{2}\right) \quad (13)$$

It is well know that the left hand side of (13) is convergent for any value of B_i . The series could be expanded as:

$$\begin{aligned} & \sum_{r=0}^{\infty} \frac{B_i^{(2r+1)}}{\prod_{n=0}^r (2n+1)} \\ &= B_i \left[1 + \frac{1}{3}B_i^2 + \frac{1}{15}B_i^4 + \frac{1}{105}B_i^6 + \frac{1}{945}B_i^8 + \dots \infty \right] \\ &\leq B_i \left[1 + \frac{1}{3}B_i^2 + \frac{1}{3^2}B_i^4 + \frac{1}{3^3}B_i^6 + \frac{1}{3^4}B_i^8 + \dots \infty \right] \\ &= B_i \left[\frac{3}{3 - B_i^2} \right] \end{aligned} \quad (14)$$

Using the above series, it could be simplified as:

$$\frac{3B_i}{3 - B_i^2} e^{-B_i^2/2} \geq \sqrt{\frac{\pi}{2}} (2y_i + 1) \quad (15)$$

Similarly, for $\varphi(\delta)$ and letting $\varphi(\delta) = z$:

$$\frac{3\delta}{3 - \delta^2} e^{-\delta^2/2} \geq \sqrt{\frac{\pi}{2}} (2z + 1) \quad (16)$$

Hence the equivalent deterministic model of the multi-objective chance constrained programming model (5–8) could be presented as:

$$\text{Max } x_1(\alpha), x_2(\alpha), \dots, x_n(\alpha) \quad (17)$$

Subject to

$$\frac{3B_i}{3 - B_i^2} e^{-B_i^2/2} \geq \sqrt{\frac{\pi}{2}} (2y_i + 1), \quad i = 1, \dots, I \quad (18)$$

$$\frac{3\delta}{3 - \delta^2} e^{-\delta^2/2} \geq \sqrt{\frac{\pi}{2}} (2z + 1) \quad (19)$$

$$x_i(\alpha) - B_i \sigma[\tilde{v}(i)] \geq E[\tilde{v}(i)], \quad i = 1, \dots, I \quad (20)$$

$$\sum_{i=1}^I x_i(\alpha) - \delta \sigma[\tilde{v}(N)] \leq E[\tilde{v}(N)] \quad (21)$$

$$y_i \geq 1 - \alpha, \quad i = 1, \dots, I \quad (22)$$

$$z \leq \alpha \quad (23)$$

$$x_i(\alpha) \geq 0, \quad i = 1, \dots, I \quad (24)$$

$$B_i, \delta \text{ are unrestricted in sign} \quad (25)$$

$$0 \leq y_i, \quad z \leq 1$$

$$0 \leq y_i, z \leq 1 \quad (26)$$

3.3 Solution Procedure

Now, we adopted an interactive fuzzy programming approach to solve the proposed multi-objective stochastic programming model (5–8) as follows:

Step 1: Ask the cooperating players to specify the satisfying level, α for the constraints (6–7).

Step 2: Convert the formulated multi-objective stochastic programming problem into its equivalent deterministic problem using the chance constrained programming technique as mentioned above.

Step 3: Solve the multi-objective deterministic problem obtained in step 2, using only one objective at a time and ignoring the other objectives. Repeat this n time for the n different objective functions.

Step 4: Using the solutions obtained in step 3, find the corresponding value of all the objective functions at each of the solutions.

Step 5: From Step 4, obtain the upper and lower bounds (U_i and L_i , $i = 1, \dots, I$) for each of the objective functions.

Step 6: Using a linear membership function, formulate the single objective non-linear deterministic model by introducing the augmented variable λ .

Thus, the model (17–26) could be formulated as follows:

$$\text{max } \lambda \quad (27)$$

Subject to

$$x_i - (U_i - L_i)\lambda \geq L_i, \quad i = 1, \dots, I \quad (28)$$

$$\frac{3B_i}{3 - B_i^2} e^{-B_i^2/2} \geq \sqrt{\frac{\pi}{2}} (2y_i + 1), \quad i = 1, \dots, I \quad (29)$$

$$\frac{3\delta}{3 - \delta^2} e^{-\delta^2/2} \geq \sqrt{\frac{\pi}{2}} (2z + 1) \quad (30)$$

$$x_i(\alpha) - B_i \sigma[\tilde{v}(i)] \geq E[\tilde{v}(i)], \quad i = 1, \dots, I \quad (31)$$

$$\sum_{i=1}^I x_i(\alpha) - \delta \sigma[\tilde{v}(N)] \leq E[\tilde{v}(N)] \quad (32)$$

$$y_i \geq 1 - \alpha, \quad i = 1, \dots, I \quad (33)$$

$$z \leq \alpha \quad (34)$$

$$x_i, \lambda \geq 0, \quad i = 1, \dots, I \quad (35)$$

$$B_i, \delta \text{ are unrestricted in sign} \quad (36)$$

$$0 \leq y_i, \quad z \leq 1 \quad (37)$$

Hence, the model (27–37) could be solved using any optimization software, where the solution is always an imputation of the game that maximizes the payoff for each of the cooperating player.

4 Illustrative Example

Consider a joint production model in which three decision makers pool three resources to make a finished product. The three decision makers (referred to as DM1, DM2 and DM3) possess three different initial resources. Let us consider that the decision makers decide to undertake a joint product. It is natural for the three decision makers to try to evaluate the revenue of the joint product in order to decide whether the project can be realized or not. However, the average profit per ton of the product is dependent on a number of factors such as product market price, product cost, consumer demand, the relation of commodity supply and demand, etc. Hence, the average profit is not deterministic, however, it is an approximate evaluation which is normally distributed. This situation can be modeled as a 3-players stochastic Gaussian cooperative game with the following characteristic function:

$$S \quad \{DM1\} \quad \{DM2\} \quad \{DM3\} \quad \{DM1, DM2, DM3\}$$

$$\bar{v}(S) \quad N(20, 1.6) \quad N(27, 0.9) \quad N(10.3, 1.5) \quad N(40, 4.3)$$

Decision maker 1 would cooperate with decision maker 2 and 3 to form the grand coalition, where the probability of satisfying the individual and group rationality constraints is 95% so it is required to find an allocation of the decision makers' profit share in the stochastic grand coalition.

Following the proposed model, the obtained deterministic programming problem for the multi-objective stochastic problem will be:

$$\text{Max } x_1(\alpha), x_2(\alpha), \dots, x_n(\alpha)$$

Subject to

$$\frac{3B_i}{3 - B_i^2} e^{-B_i^2} \geq \sqrt{\frac{\pi}{2}}(2y_i + 1), \quad i = 1, 2, 3$$

$$\frac{3\delta}{3 - \delta^2} e^{-\frac{\delta^2}{2}} \geq \sqrt{\frac{\pi}{2}}(2z + 1)$$

$$x_1 - 1.6B_1 \geq 20$$

$$x_2 - 0.9B_2 \geq 27$$

$$x_3 - 1.5B_3 \geq 10.3$$

$$\sum_{i=1}^3 x_i - 4.3 \delta \leq 40$$

$$y_i \geq 0.95, \quad i = 1, 2, 3$$

$$z \leq 0.05$$

$$x_i \geq 0, \quad i = 1, 2, 3$$

$$B_i, \delta \text{ are unrestricted in sign}$$

$$0 \leq y_i, \quad z \leq 1$$

Solving the problem for the three objectives of of^1 , of^2 , and of^3 , the optimal solutions are obtained as X^1 , X^2 and X^3 , respectively as follows:

$of^1 = 48.620264$	$of^2 = 55.451079$	$of^3 = 38.575078$
$X^1 = \begin{pmatrix} 48.620264 \\ 28.010307 \\ 11.983845 \end{pmatrix}$	$X^2 = \begin{pmatrix} 21.796102 \\ 55.451079 \\ 11.983845 \end{pmatrix}$	$X^3 = \begin{pmatrix} 21.796101 \\ 28.010307 \\ 38.575078 \end{pmatrix}$
$B^1 = \begin{pmatrix} 1.132776 \\ 1.122563 \\ 1.122563 \end{pmatrix}$	$X^2 = \begin{pmatrix} 21.796102 \\ 55.451079 \\ 11.983845 \end{pmatrix}$	$X^3 = \begin{pmatrix} 21.796101 \\ 28.010307 \\ 38.575078 \end{pmatrix}$
$B^1 = \begin{pmatrix} 1.132776 \\ 1.122563 \\ 1.122563 \end{pmatrix}$	$B^2 = \begin{pmatrix} 1.122563 \\ 1.132776 \\ 1.122563 \end{pmatrix}$	$B^3 = \begin{pmatrix} 1.122563 \\ 1.122563 \\ 1.132776 \end{pmatrix}$

$$\delta = -1.122563$$

$$y^1 = \begin{pmatrix} 0.95 \\ 0.95 \\ 0.95 \end{pmatrix} \quad z = 0.05$$

Using the linear membership function, we formulate the following programming problem:

$$\text{max } \lambda$$

Subject to

$$x_1 - 26.824162 \lambda \geq 21.796101$$

$$x_2 - 27.440772 \lambda \geq 28.010307$$

$$x_3 - 26.591232 \lambda \geq 11.983845$$

$$\frac{3B_i}{3 - B_i^2} e^{-B_i^2/2} \geq \sqrt{\frac{\pi}{2}}(2y_i + 1), \quad i = 1, 2, 3$$

$$\frac{3\delta}{3 - \delta^2} e^{-\delta^2/2} \geq \sqrt{\frac{\pi}{2}}(2z + 1)$$

$$x_1 - 1.6B_1 \geq 20$$

$$x_2 - 0.9B_2 \geq 27$$

$$x_3 - 1.5B_3 \geq 10.3$$

$$\sum_{i=1}^3 x_i - 4.3 \delta \leq 40$$

$$y_i \geq 0.95, \quad i = 1, 2, 3$$

$$z \leq 0.05$$

$$x_i, \lambda \geq 0, \quad i = 1, 2, 3$$

B_i, δ are unrestricted in sign

$$0 \leq y_i, \quad z \leq 1$$

Solving the above programming problem, we get the compromise solution as:

$$\begin{aligned} x_1 &= 21.796396 & x_2 &= 28.010608 & x_3 &= 11.984137 \\ B_1 &= 1.1226 & B_2 &= 1.1226 & B_3 &= 1.1226 & \delta &= -1.1226 \\ y_i &= 0.95, & i &= 1, 2, 3 \\ z &= 0.05 \end{aligned}$$

5 Conclusions

In this paper, we proposed a multi-objective stochastic optimization model for cooperative games in which the values of characteristic function are random variables (stochastic) and the players only know their probability distribution. The developed model always converges to the optimal solution maintaining the imputation of the game. Two major advantages of our developed model to other researches are that; it does not depend on the risk behaviour of the cooperating players, and each coalition has several actions to choose from. Moreover, the proposed model could

also be applied on Poisson valued games not only Gaussian valued ones. Finally, we used the chance constrained technique to convert our proposed stochastic model to its deterministic one and the resulted model is then solved by the interactive fuzzy programming technique to obtain the compromise solution.

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Banking Sector Performance and Economic Growth: An Empirical Evidence of UAE Islamic Banks

Mosab I. Tabash

Abstract

This study investigates the relationship between the performance of Islamic banks and economic growth in the United Arab Emirates. Return on Assets (ROA), Return on Equity (ROE) and Net Revenue Margin (NRM) are used as proxies for the performance of Islamic banks while Growth Domestic Product (GDP) is used as a proxy of economic growth. The sample consists of all full-fledged Islamic banks working in the UAE. The study period ranges from 2000 to 2014. Pooled Ordinary Least Square (POLS) combined with multicollinearity test are done to test the hypotheses. The results show that there is a positive relationship between the performance of Islamic banks and economic growth in the UAE. The empirical results of the study suggest that the policy makers of UAE should support the Islamic banking sector by setting new measures for its growth and progress.

Keywords

Islamic banking • Banking performance • Economic growth • ROA • ROE

1 Introduction

Islamic banking is one of the fastest growing sectors in the last decade. It is considered as an effective mechanism for funding sound projects worldwide. The positive high growth rate of Islamic finance assets year after year pushes all policy makers, bankers and financial scholars to look into Islamic finance industry. Currently, Islamic financial assets are approaching U.S. \$2 trillion, for all financial and non-financial institutions [1]. Organisations like “Ernst & Young”, and the Malaysia Islamic financial centre have

predicted that the size of the market will reach U.S \$3.4 trillion by end of 2018, whilst PricewaterhouseCoopers (PwC) predicts a U.S \$2.7 trillion market by 2017 [2]. In most of Middle East region, the assets of Islamic banking assets are growing faster than conventional banking assets. There are also a huge demand for Islamic banks products from non-Muslim countries like Malaysia, U.K., Germany and Hong Kong. Islamic finance is based on divine principles like prohibition of interest, an equity-based, asset-backed, ethical, sustainable, environmentally and socially-responsible finance. Banking sector is accounting for almost 80% of the total Islamic finance assets [1]. Therefore, the profitability of Islamic banks is very important for the welfare and economic growth for any country.

The banking sector performance and profitability contribute to the growth of economies and help them to absorb the negative and external financial shocks [3, 4]. Furthermore, Islamic banks (IBs) have played a significant role in the growth of Gross Domestic Product (GDP) and investments of the Middle East countries [5]. There are not many studies that have been conducted to determine the factors that affect the profitability of Islamic banks. Therefore, understanding of profitability determinants of Islamic banks is very vital. So, the objective of this study is to determine the factors that are affecting Islamic banks profitability of UAE.

The Islamic banking industry is not new financial system or concept but its importance come to surface in and after global financial crisis 2008. It proves its stability under various crisis and financial shocks particularly during the last financial crisis. The United Arab Emirates (UAE) gives more interest and support for Islamic banking industry. For Example, Dubai is working on to become a hub for Islamic finance industry in the world. The UAE government supports the Islamic banking industry growth through its strategic plan 2021 [6]. Islamic banks assets of the UAE have grown from U.S. \$1 million in 1990 to more than U.S. \$71,000 million in 2014 with a total increment up to 98.59% as appeared in Fig. 1.

M. I. Tabash (✉)
College of Business, Al Ain University of Science and Technology, Al Ain, United Arab Emirates
e-mail: Mosab.tabash@au.ac.ae

Fig. 1 Islamic financial investments in UAE (1990–2014)



Currently, there are twenty three local banks and twenty two international banks working in the UAE. Out of the twenty three local banks, seven are full-fledged Islamic banks working under Islamic standards as appeared in Table 1 and the rest banks have both systems, Islamic and traditional operations [6].

With the UAE government vision to enhance Islamic finance growth, Dubai in its vision 2021 is to be a key city in the world economy, and its aim is to enhance its image by improving its power as a financial leader in the region. Dubai's declaration as a capital of Islamic economy is the first step to considering Dubai as a major trading center. This can be achieved through transferring Dubai to a sound economic model shaped by innovation, highly capital and labour, and surrounded by encouraging environment [7]. Therefore, the efficiency of every sector contributes towards achieving the Dubai vision. So, in this study, we test the link between the performance of Islamic banks and economic growth in the UAE which in turn will help in achieving the vision of UAE. The study gives an answer to this research question.

What is the relationship between the performance of full-fledged Islamic banks and economic growth of UAE?

2 Literature Review

Most studies have agreed on that there is a link between the performance of banking sector and economic growth of any country. Most businesses depend on the availability of funds

provided within the economy by financial institutions and banks to facilitate transactions. Therefore, this research is done to assess and determine how performance and profitability in the banking industry, particularly Islamic banking, contribute to economic growth in UAE. There are many studies that discussed the relationship between banking sector performance and economic growth. Most of these studies are done in testing the relationship between the performance and profitability of commercial banks but there are limited studies that test the same relationship in the context of Islamic banks. Therefore, the current study examines the relationship between the profitability and performance of Islamic banks and economic growth of UAE. Firstly, we showed commercial banks and economic growth studies. Secondly, studies that addressed the relationship Islamic banks and economic growth will be addressed.

In a study, [8] showed in his study the relationship between the performance of commercial banks in Jordan and economic growth. He used ROA, deposits and credit facilities as independent variables and GDP as dependent variables. He used pooled regression analysis to test the relationships between variables. He concluded that the performance of commercial banks on Jordan contribute to growth of the economy.

In the previous year, [9] in his study of the effects of banks profitability on economic growth of Nigeria showed that there is a direct relationship between banks profitability and economic growth in the context of Nigeria. He used a pooled regression method for all banks working in Nigeria

Table 1 Islamic banks in UAE

No	Bank name	Establishment date
1	Dubai Islamic bank (DIB)	1975
2	Abu Dhabi Islamic bank (ADIB)	1997
3	Sharjah Emirates bank	2002
4	Emirates Islamic bank	2004
5	Hilal bank	2008
6	Ajman bank	2009
7	Noor bank	2008

under the period 2005–2014 for the variables Gross Domestic Product (GDP), Return on Equity (RoE), and Return on Capital Employed (RoCE). He recommended that the central Bank on Nigeria (CBN) and the government should work to develop more wise measures for banks regulations and transparency.

In another study, [10] have studied the impact of performance of banking sector and economic growth of Pakistan. They used a sample of 10 commercial banks for a period ranging from 2008–2012. They utilized ROA, deposits, and interested earnings as independent variables and GDP as dependent variable. They concluded that there is a positive relationship between RoA, deposits, interest earnings and GDP in Pakistan. Further, [11] tested the link between internal and external factors over bank profitability by using data of 15 commercial banks of Pakistan under the period 2005–2009. Their study utilized the pooled ordinary least square (POLs) to examine the impact of the independent variables such as assets, loans, equity, deposits, inflation and market capitalization on major profitability indicators such as Return on Asset (ROA), Return on Equity (ROE), Return on Capital Employed (ROCE) and Net Interest Margin (NIM). They concluded that there is a strong relationship between the internal and external factors in the profitability of Pakistan commercial banks which in turns leads to progress in Pakistan GDP.

Another study of Qatar, [12] has examined the relationship between the performance of commercial banks in Qatar and economic growth. They used RoA, GDP, foreign interest rate, governmental revenues, and government expenditures as variables. They used pooling regression method for the data analysis for the period ranging from 2006 to 2007. They concluded that the performance of commercial banks is very important to Qatar economic growth.

In 2011, [13] studied the impact of the performance of private banks on the growth of the economy in case of Iran. They adapted GDP, RoA, cash, and investments as study variables. They used secondary data for the analyses. SPSS software is used for hypothesis testing. Their results concluded that RoA, cash, and investments have a greater impact on the economic growth of Iran. In a study of the Tunisian banking industry, [14] showed that the profitability and performance of the banking sector contribute to the economic growth of Tunisia. He tested the profitability for 10 conventional banks in Tunisia for the period 1980–2000. His results concluded that high net interest margin and profitability are likely to be linked with banks with high amount of capital and large overheads.

Further, [15] in their study examined the micro and macro determinants of commercial banks' profitability in UAE from the period 2009–2013. They stated a significant positive connection between capital adequacy, asset quality and operational efficiency on profitability of commercial banking

sector. Their results didn't support the existence of any relationship between liquidity management and profitability of commercial banks. Also, they found that there is a negative relationship on both return of assets and return of equity of commercial banks of UAE.

Moreover, [16] studied the impact of the development of financial sector on economic growth for Middle East and North Africa (MENA) countries. They used a private credit to GDP, M2/GDP, the ratio of commercial bank assets to the total of commercial bank assets and central bank assets as study independent variables. Real GDP is used as dependent variable. They used a sample of 11 countries for the period ranging from 1980 to 2012. Panel autoregressive distributed lag (ARDL) framework is used for the analysis. Their results concluded by giving directions to enhance financial development in the MENA region by applying more financial reforms to create a competitive environment in the financial sector.

The studies that addressed the relationship between performance of Islamic banks and economic growth are limited. Most of the studies are discussing the role of Islamic banking in economic growth [5, 17, 18]. Also, some studies concentrated on stability of Islamic banking during global financial crisis 2008 like [4, 19]. With respect to Islamic banking performance and its relation with the growth of the economy in some countries, we provide studies that relevant to the objective of the study. A study of [20] discussed the profitability of Islamic and commercial banks in Gulf Cooperation Council (GCC) for 1997–2004 periods. He took into account both internal factors (asset quality, capitalization, work efficiency, total expenses) and external factors (interest, industry structure, and regulations) factors as determinants of profitability (ROA, ROE). He concluded that conventional banks have better asset quality as compared to Islamic banks. However, Islamic banks are more capitalized. Moreover, the results also suggested that interest-free lending in Islamic banking does increase profitability in GCC banks.

In another study, [21] tested the internal determinants, where the assets of banks, capital adequacy, liquidity, credit risk and liquidity ratios were used to assess the profitability of Islamic banks of Malaysia. The results of her study showed that only the size of banks significantly affected the profitability of Islamic banks in the Malaysia.

Another study of Indonesia, [22] investigated Islamic banks' profitability determinants in Indonesian banking sector. The results of the study found that internal factors have no influence on profitability of Indonesia Islamic banks, and were statistically insignificant. The results have supported the positive relationship and statistically significant between inflation and Islamic banking sector profitability. Further, [23] showed in his study that assets size, risk level and management efficiency are the major determinants of Malaysian Islamic banking sector. While in the Middle East, [24] examined the internal variables and

external factors impact on the profitability of Islamic banks. The positive and significant relationship is found between capital adequacy and profitability of Islamic banks. He also found the significant and positive relationship between inflation and the profitability of Middle East Islamic banks. Followed by another a work done by [25] on the other Islamic banks of the Middle East. They found that Islamic banks funds cost are less than other financial institutions in the Middle East.

Also, [10] studied the determinants of profitability of Islamic banking sector in Pakistan. Their study showed the factors that affected the profitability of Islamic banking industry during the period of 2007–2014. They used bank specific factors and external factor as independent factors. In their study, Return on Assets (ROA), Return on Equity (ROE), and Earnings Per Share (EPS) are used as dependent variables. Findings of their study indicated that profitability is significantly affected by bank-specific factors and also by external factors.

In another study, [26] have examined whether bank-specific and macro-economic factors influence the Islamic banks' profitability in some selected countries of the world. They used the balanced data regression model to test the relationship between the variables for the period 2005–2010. The results of their study showed that banks with larger assets size and with efficient management lead to greater return on assets and equity. Ijaz et al. [27] examined the relationship between the banks internal factors on the performance of Islamic banks in Pakistan during the period 2006–2013. In their study, bank size, gearing ratio, operational efficiency, asset management, and capital adequacy ratios were used as independent variables and ROA and ROE were used as dependent variables of profitability. They concluded that there is a significant relationship between bank size and ROA of banks of Pakistan.

In our study, we use very popular variables as proxies for determinants of Islamic banks profitability in UAE. This study is the first study of its kind which is being done in a country where Islamic banking has footprints. Furthermore, all full-fledged Islamic banks are included in the study. A longer period for analysis, i.e., 1990–2014 is used. So, the results of this study will be more inclusive and accurate than that of other studies.

3 Research Methodology

3.1 Sample and Data Collection

The sample of this study is all full-fledged Islamic banks working in United Arab Emirates (UAE) as shown in Table 2. A panel time series data covering from 2000 to

2014 is used. The data set is extracted from Islamic Banks and Financial Institutions Information (IBIS) database [28]. Microsoft Excel and Eviews 7 are used to do all the tests and statistical analysis. Natural Algorithms are taken for all variables before regression analysis. For the analysis, firstly, Microsoft Excel was used to calculate financial ratios. Secondly, Eviews software was used for hypothesis testing and to determine the factors that affect economic growth of UAE.

3.2 Variables

There are four variables used in the study. Three variables are used as independent variables and one variable used as independent variable.

Dependent variables. With the connection with the literature review, we select Return on Assets (ROA) and Return on Equity (ROE), and Net Revenue Margin (NRM) as a measure of performance and profitability of Islamic banks. Return on assets (ROA) is a popular—measure for banks profitability to assess and evaluate the ability of the banks to generate return from its assets to maintain profit while (ROE) is a second common measure that accounts for the return generated from the shareholders' equity. Net Revenue Margin (NRM) is a good measure to show the net revenue remained after deductions of all expenses. A higher net profit margin means a higher profitability of the bank.

Independent variables. We use a common and popular measure to test the output of the economic growth of any country over a certain period of time. GDP is the most imperative economic indicator that reflects overall health of the economy.

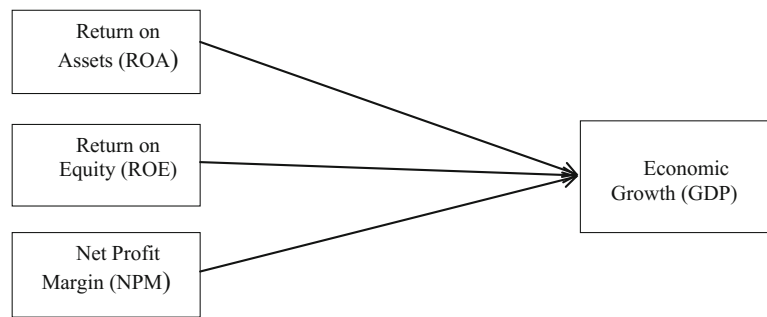
3.3 Study Framework

The study framework that connects the relationship between dependent variables and independent variables is shown in Fig. 2.

Table 2 Descriptive summary of the study variables

	GDP (\$ million)	ROA (%)	ROE (%)	NRM (%)
Mean	270,728.50	2.67	9.84	8.58
Median	289,880.40	1.37	9.53	5.24
Maximum	403,197.70	17.16	29.23	14.30
Minimum	103,311.60	−3.06	−18.41	0.31
Skewness	−0.26	1.88	−0.13	7.85
Kurtosis	1.59	6.50	5.35	62.71
Observations	65	65	65	65

Fig. 2 Study framework for all variables



3.4 Study Model

In this study, the relationship between the performance of Islamic banks and economic growth of the UAE is examined using pooled regression method.

$$Y(\text{GDP}) = \alpha + \beta_1(\text{ROA}) + \beta_2(\text{ROE}) + \beta_3(\text{NRM}) + \varepsilon \quad (1)$$

where,

GDP: Dependent variable to measure economic growth

α : Constant

β_1 – β_3 : Coefficients of independent variables

ε : Error term

ROA, ROE, NRM: Independent variables to measure the performance of Islamic banking sector.

Based on the results of this model, the author can give a decision to accept or reject the following research hypotheses. The following hypotheses are developed like below.

H1: Return on Assets (RoA) of Islamic banks has a significant impact on Economic Growth of UAE.

H2: Return on Equity (RoE) of Islamic banks has a significant impact on Economic Growth of UAE.

H3: Net Profit Margin (NPM) of Islamic banks has a significant impact on Economic Growth of UAE.

4 Analysis, Results and Discussion

4.1 Descriptive Statistics

Table 2 presents the descriptive results for all variables of the study. For the profitability variables, the mean of ROA is 2.67% while for ROE is 9.84%. The same picture is drawn for NRM with mean equals to 8.58 and median equals to 5.24. For dependent variable, the median is more than the mean which means the results are negatively skewed. The mean for GDP is 270,728.5, respectively.

4.2 Correlation Matrix

Table 3 shows the correlation coefficients between explanatory variables. Gujarati [29] stated that correlation more than 0.75 between explanatory variables means that there is multicollinearity between variables. It is clear from the Table 5 that the correlation coefficients between variables were less than 0.75. This indicates that there is no multicollinearity between variables.

4.3 Regression Analysis Results

For the regression analysis and hypothesis testing, we used pooled ordinary least square (OLS) to test the relationship between variables. It is clear from the results shown in Table 4 that the model is good since R square is 81% more than 70% which indicates that 81% variations in GDP is explained by the independent variables (ROA, ROE, and NRM). The F statistic and p value are 10.10 and 0 respectively which means the whole model is significant and there are relationships between the variables. It is also indicated that the overall model is a good fit and the independent variables are jointly affecting the economic growth of UAE. For ROA, It is obvious from the Table 4 that the p value is 0.00 less than (0.05) level of significance. It means that the null hypothesis is rejected and the alternative hypothesis is accepted. This leads us to say there is a positive and significant relationship between ROA and GDP. This result is confirmed by [8] who found that the ROA has a positive impact on economic growth of Jordanian banking sector. Also, [4] in their study showed that ROA of Islamic banks didn't affected by global financial crisis and contributed to the developed of the Middle East economies.

With respect to (ROE), the results indicate that the p value is 0.00 less than (0.05) level of significance. Therefore, we reject the null hypothesis and accept the alternative hypothesis. So, there is a positive and significant relationship between ROE of Islamic banks and GDP in UAE. These results are similar to Gull et al. [11] who found a positive significant relationship between ROE of banks and

Table 3 Correlation matrix

	GDP	ROA	ROE	NRM
GDP	1.00			
ROA	-0.30	1.00		
ROE	-0.22	0.12	1.00	
NRM	0.15	0.11	-0.05	1.00

Table 4 Pooled OLS analysis output

Variables	Coefficients	Std. error	t-statistic	Prob.
Constant	12.43	0.06	211.58	0.00
ROA	0.26	0.03	7.65	0.00*
ROE	0.31	0.05	6.79	0.00*
NPM	0.01	0.03	0.26	0.79
R squared	0.81			
Adjusted R squared	0.73			
F-statistic	10.10			
Prob.	0.0			

*Significance at 5%

Table 5 Diagnostics tests results

No.	Test name	Model values
1	(Jarque–Bera test), normal	0.980922
2	Mean variance inflation factor (VIF)	3.354

Economic progress in Pakistan. Also, [9] found the same relationship for performance of banking sector of Nigeria.

Regarding the relationship between Net Revenue Margin (NRM) of Islamic banks and GDP in UAE, the results show that p value is 0.79 more than (0.05) level of significance. This means we accept the null hypothesis and reject the alternative hypothesis. Therefore, we can say there is no significant relationship between NRM of Islamic banks and GDP in UAE but the relationship is still positive. The Pooled Ordinary least Square model (OLs) passed all the diagnostic tests against multicollinearity ($VIF < 10$) and normality (Jarque–Bera test, p value > 0.05). All results are shown in Table 5.

5 Conclusion

The study tested the relationship between the performance of full-fledged Islamic banks and Economic growth of UAE. We used Return on Assets (ROA), Return on Equity (ROE) and Net Revenue Margin as proxies for Islamic banks performance and GDP as a proxy for Economic growth. After regression analysis, we conclude that there is a significant and positive relationship between the performance of Islamic banks (ROA, ROE) and economic growth (GDP) in case of UAE. For Net Revenue Margin (NRM), the

results conclude that there is insignificant relationship with GDP of UAE. It is clear from the study that the Islamic banking sector is playing major role in economic growth. Therefore, Government policies should follow efficient policies that enhance the profitability and performance of Islamic banks in the country. Central bank of the UAE (CBU) may develop a corrective measure to tighten the risk management framework to enhance the profitability of Islamic banks in the country.

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Challenges of Business Schools to Implement Accreditation Standards: Case Study

Doaa Wafik and Assem Tharwat^{ID}

Abstract

There are challenges and obstacles to higher education institutions in implementing the accreditation standards for the national and international accreditation bodies. However, it has difference importance levels. Studies have shown that, the weakness of understanding the accreditation concept and the lifelong learning concepts which represent part of the institutional culture comes as the first challenge of these obstacles and it is classified under the type of educational and cognitive obstacles. Many other challenges will be discussed in this article under different titles like the organizational issues, financial issues, Library issues, Policies of Admission, Human resources, Faculty members' qualifications and the scientific research. In recent studies, it is observed that higher education Business Schools in the Arab region are in dire need of reviewing their systems and building an administrative system based on the application of TQM concepts in all its aspects to improve performance and develop its university outputs for the sack of meeting the accreditation standards for both the national and international levels. This article will be followed by a comparative study among eight different Business schools in the United Arab Emirates and Egypt to conclude with many recommendations and suggestions for officials of higher education institutions that may help them remove obstacles that impede the implementation of the imposed accreditation standards nationally by CAA in UAE and NAQAAE in Egypt and internationally by AACSB.

Keywords

Accreditation standards • Education quality challenges • Higher education institutions • AACSB • CAA • NAQAAE

1 Introduction

Contemporary global social communication combines that university education will be a competitive arena among world powers, especially in an increasingly interdependent and interdependent world. Yet educational systems are constantly criticized. This monetary process seems to be a phenomenon shared by experts of different perspectives. Some believe that the developing community should adopt a reform project, which aims to take the hand of higher education in developing countries so that its deviations can be adjusted and made parallel to the scientific progress of the world's top-ranking countries.

Management education field is undergoing new changes because of globalization, technology revolution, innovative styles of competition, and exaggerated stress on social control ability [1]. All those powers placed stress on graduate business schools' top managers to revisit and brainstorm their institution mission and revise their offered programs to improve its quality to meet the field requirements. During the next two decays if Business Schools don't modify or even change their strategic directions to adapt the desires world market dynamicity they'll not be able to continue and they'll quit the education industry [2].

In the beginning of the third Millennium, all the US's Business Schools faced a huge challenges from their main challengers from the other countries specially the European good schools in different parts of the world [3], and the top ranking schools can't rely on these ranks since putting the accreditation concepts in front of them, the European Business schools are changing very rapidly, totally and quickly and there is no doubt about the negative impact on the

D. Wafik (✉)
Bader University, Cairo, Egypt
e-mail: doawafik@gmail.com

A. Tharwat
College of Business Administration, American University
in the Emirates, Dubai, UAE
e-mail: assem.tharwat@aeu.ae

student enrollments in U.S. [4–6]. The creation of the European Union played an important role in this type of competition, since it allows the European countries to align their higher education systems to facilitate the students exchange, increase the quality, standardize the credit measures, and rationalize the awarded degrees through Europe [6].

Higher Education Institutes in both the United Arab Emirates and Egypt continues to evolve in terms of its diversity, the numbers of institutions and programs, and the quality of education available to students. The Commission for Academic Accreditation (CAA) in the United Arab Emirates is committed to maintaining the rigor of its Standards for Licensure and Accreditation (the Standards) while respecting the diversity of educational provision and encouraging innovation and creativity in educational strategies. In the other hand The National Authority for the Quality Assurance of Education and Accreditation (NAQAAE) in Egypt stipulates that this body is independent and has the general legal personality, it follows the Prime Minister and its headquarters is in Cairo. In addition, the Association to Advanced Collegiate Schools of Business (AACSB) is the international accreditation body for business school that located in United States. In 2013 the AACSB Accreditation Standards were revised, as well as the surrounding processes and documentation requirements [7–9].

The establishment of a comprehensive quality unit in the business schools in the universities considering international standards will contribute to the development of universities in the Arab countries, and thus the development of colleges and raise their level and show their position in international forums. Vision for the concept of quality The traditional concept of the quality of education was linked to the processes of examination and analysis and focus only on the final tests without reviewing the abilities and skills cognitive, motor, logical and behavioral, This traditional concept of quality in education has turned into the modern concept of quality assurance, which is based primarily on the need to select typical performance rates and build quality education management systems, and with the difficulties of implementation, the importance of quality management in education, which requires the participation of all to ensure the survival and continuity of educational institutions It is a way to improve performance more efficiently.

Thus, the main aim of this article is to clarify the challenges that might be face the implementation process for the accreditation in both national and international levels. The following section start by introducing the educational accreditation, followed by reviewing the national (CAA & NAQAAE) accreditations standards and the international standards for the business schools' accreditation AACSB. Next, some common challenges that business colleges

confront yet implementing the accreditation process. A comparative study is conducting to show how these challenges can affect the accreditation process and delay the not only the international accreditation but also the national one, followed by some recommendations that provided to address and to tackle these challenges [10].

2 Accreditation for the High Educational Institution

In 2004, UNESCO organized the Arab Regional Conference on Higher Education, which emphasized the importance of quality in higher education. The conference urged Arab countries to establish a mechanism to assess the quality of higher education at all levels: organizational, institutional, programs [10]. UNESCO organized a conference in Damascus in cooperation with the Union of Arab Universities, in the recommendations, they stressed the need to establish quality assurance mechanisms and to promote the culture of assessment and accreditation in Arab universities (Quality Assurance and Accreditation 2004).

Quality assurance has become a common concern in the Arab region, this is due to several factors that includes: The expansion of globalization, the increasing number of students enrolled in higher education, limited funding, the proliferation of private higher education institutions, e-learning, literary and professional commitment, and the concerns associated with the quality of education. However, quality assurance is different from that of developed countries. Factors that make it unique in this part of the world. Among these factors are the limited competition to attract students and the scarcity of universities to the detriment of competition and the fact that some programs are offered only in one institution and the high cost of foreigner experts.

Quality Assurance purpose from the perspective of Arab universities, can be defined as follows [11, 12]:

- Ensuring clarity and transparency of academic programs.
- Provide clear and accurate information to students, and set clear and accurate objectives for the programs offered by the university, and to verify that the conditions necessary to achieve these objectives are effective and that they will continue to maintain this level.
- Ensure that the educational activities of accredited programs meet the requirements of academic accreditation and comply with international standards in higher education and the requirements of professions as well as the needs of the university, students, state and society.
- Enhancing the reputation of programs that are evaluated and approved by a community that believes in external evaluation and academic accreditation processes.

- Provide a mechanism for accountability of all those involved in the preparation, implementation and supervision of academic programs.
- Strengthen and support the confidence of the state and society in the programs offered by the university.
- Upgrading the quality of professional services provided by the university to the community.

Not only Arab countries are keen on their cultural identity and consider their cultural specificities, but also, they will not leave the good opportunity to benefit from the experiences of others, especially those that have proven success and leadership take from them consistent with their values and constants. The quality assurance movement is emerged as a positive reaction to what the academics Officials and society are concerned about the quality of higher education, which resulted from many factors including international competition, changing market needs and financing. Societies and governments are also concerned about the quality of higher education and seek to establish systems that clearly define responsibilities. Hence, it can be said that quality assurance is necessary to meet the quality and responsibility requirements of higher education [12–14].

3 Accreditation Standards

The AACSB Accreditation Standards were first adopted in 1919. Throughout the years, the standards have continued to be revised to ensure quality and continuous improvement in collegiate business education. In 2010, the AACSB Accreditation Standards were revised, as well as the surrounding processes and documentation requirements. The latest revision occurred in 2013 after more than two years of study and collaboration with the global management education community and employer organizations [15]. There are two main accreditation standards. The internal/local one and this set of standards depends on the national's strategy and orientation. The local accreditation bodies for Higher education schools are: CAA in UAE and NAQAAE in Egypt.

CAA Higher education in the United Arab Emirates continues to evolve in terms of its diversity, the numbers of institutions and programs, and the quality of education available to students. The Commission for Academic Accreditation (the Commission or CAA) is committed to maintaining the rigor of its Standards for Licensure and Accreditation (the Standards) while respecting the diversity of educational provision and encouraging innovation and creativity in educational strategies [16].

The National Authority for the Quality Assurance of Education and Accreditation NAQAAE was established by Law No. (82) for the year 2006 under the presidency of the

Republic. It stipulates that this body is independent and has the general legal personality. It follows the Prime Minister and its headquarters is in Cairo and the Authority may establish branches in the governorates [17].

Quality assurance is the process of verifying that the standards Academic and institutional that are compatible with the institution's mission have been identified and defined and achieve them in line with the corresponding standards both at the level National or global level, and that the quality of learning opportunities, scientific research and participation and environment development are more appropriate or superior to the expectations of all types of end stakeholders.

4 Education Internationalization and Accreditation

An ongoing UNESCO report featured the connection between interest in postgraduate training for national monetary advancement, and how this has impacted instruction approach in South-East Asia.

In Malaysia, for instance, the National Higher Education Strategic Plan, Vision 2020, has been intended to create Malaysian research ability to both decrease the national dependence on remote mechanical research and to pull in universal venture.

In the two nations, global acknowledgment of the nature of their training accordingly turned into an urgent piece of their arrangement to attract worldwide venture, thus raising the quantities of postgraduate understudies and pushing colleges up the universal college rankings turned out to be a piece of the more extensive national financial improvement methodology.

Japan's drive to internationalized training has an alternate arrangement of objectives to those for Malaysia and Thailand, with Japanese changes planning to get ready Japanese graduates to better contend in a globalized work environment.

Changes right now under thought incorporate acquainting English-dialect educating with understudies from age 8, instead of 10–11 as at display, extending arrangement of the International Baccalaureate, and urging Japanese college understudies to think about abroad. Sponsorships of in the vicinity of 120 and 260 million yen have been offered to colleges to expand the quantity of their understudies contemplating abroad for part of their degree, since "colleges need to make [students] more open to the worldwide condition".

Enhancing the nature of advanced education Regional ways to deal with the connection between the nature of advanced education and advancement are changing, with another emphasis on look into quality getting institutional

quality confirmation a few districts, while others are additionally expanding the quantity of postgraduate understudies as an approach to enhance the nature of national innovative work.

Throughout the most recent three years, subsidizing for Mexico's National Council for Science and Technology for instance, has expanded by 32%, on the back of the new president's guarantee to raise spending on R&D to one percent of GDP by 2018, twofold the present measure of 0.48%. Some portion of this financing is for government look into stipends, part is coordinated towards enhancing graduate projects and understudy trade, and part to expanding the quantity of postgraduate understudies. Additionally, building up the nature of its advanced education and research is a need for the Brazilian government, which is right now attempting to change Brazil into a global information economy [18].

5 International Education in United Arab Emirates and Egypt

The United Arab Emirates (UAE) offers a totally extraordinary arrangement of conditions as far as financing, speculations, and income age. Every emirate has built up its own particular way to deal with making UAE an instruction center point. Abu Dhabi has welcomed widely acclaimed organizations, for example, New York University and the Sorbonne, to set up branch grounds in tweaked offices gave by Abu Dhabi Government. Likewise, the Massachusetts Institute of Technology was welcome to help create and instruct on the advancement with respect to Masdar Institute of Technology and Masdar City, the primary carbon free zone on the planet. Masdar City has world-class inquire about offices, researchers, and graduate projects—which are all upheld by the Abu Dhabi government. This speaks to a colossal local open venture. Dubai is an alternate story. Dubai's Strategic Plan required the foundation of a few subject based monetary free zones. Two of these are training centered—Knowledge International instruction centers are the most recent improvement in the global advanced education scene. Universal Higher Education Village and Dubai International Academic City. The venture arm of the Dubai government (TECOM) is ordered to fabricate the physical framework and offices for these zones and select respectable remote foundations and preparing organizations [19].

6 Accreditation Challenges

To implement quality standards, there are many challenges and obstacles faced by the administrations of the faculties of commerce. These challenges stem from some of the internal

factors in the institution which are related to faculty members, employees and even students. There is also an influence on the external factors which are related to the general policies of the country and the bodies that are accredited.

Quality and Continuous improvement processes are the crucial keys for improving the offered academic programs in any institution. The accreditation teams in the organization are responsible to monitor, enhance, evaluate, and control the two factors and they should be supported to analyze the two factors qualitatively and quantitatively, to do this, many challenge and/or obstacles will be faced. Obstacles could be classified into obstacles towards the educational & cognitive or towards the scientific research [20].

The weakness of understanding the concept of lifelong learning (continuing education) follows the set of educational and cognitive obstacles, while the weak financial support provided for scientific research belongs to the group of obstacles to scientific research.

Moreover, the Challenges could be classified into three main classes: Program Challenges, Organizational Challenges, and External challenges.

6.1 Program Challenges

Program challenges that covers the following types:

- Maintaining Program Quality
- Faculty Members Qualifications and Sufficiency
- Students' Admission and Retention
- Assurance of Learning (AOL).

Selection of high qualified Faculty members affect the program quality and graduating professionals depends on the recruited students for the program. Producing competent graduates also depends on recruiting the best. Some Business Schools in UAE (7 Schools) and in Egypt (3 Schools) have recognized this fact and considered it during the preparing to the accreditation process. The top universities in UAE and Egypt having high requirements for entry like the GMAT and TOEFL/ILELTS. Moreover, the number of admitted student in some MBA programs in certain business school(as an example the American University in the Emirates) in both UAE and Egypt have been decreased by raising the bar of the admission to those programs through increasing the entry requirements. For preparing to the national/International accreditation (e.g. CAA-NAQAEE/AACSB), the admission criteria should be considered. Lessons and success stories could be found in some national Universities like the American University in Sharjah, The American University in Cairo, and the American University in Beirut. Moreover many European and American Universities having well established quality control systems

and assurance of learning exist. In addition the AACSB exchange is considered one of the most powerful online forum to support any queries related to the accreditation process.

6.2 Management and Organization

Management and Organization that covers the following types:

- Institutional Culture
- Adequacy Human Resources
- Financial and facilities Resources
- Faculty member creativity and associated administrative load.

The backbone of any accreditation process is the institution mission, and the institution's culture reflects its mission. The culture usually defines the faculty responsibilities and expectations, it also indicates the collegiality level in the institution. Accreditation national and international standards are mission-based components.

Numerous business colleges are confronting impressive difficulties as far as selecting and keeping up qualified Faculty Members. Business college dignitaries need to deal with the various requests being made on personnel. Various systems are being executed by utilizing ordinary turnover or early retirement intends to enlist more youthful doctoral Faculty Members; putting resources into redesigning the capabilities of existing personnel; selecting staff from abroad on impermanent or long haul contracts. The general point is to build the proportion of doctoral workforce. The Faculty Members themselves are frequently in an incomprehensible position.

Each business school has its own definitions for faculty qualifications and engagement in order to meet AACSB Standard 15 requirements. Faculty qualifications criteria should include the faculty member's a) initial academic preparation or professional experience and b) continued engagement. Example for the definitions for the four categories as below:

Scholarly Academics (SA). Faculty Members who have a research doctorate degree (Ph.D. or DBA) from a recognized university that is more than 5 years old and have published a minimum of three (3) peer-reviewed research articles in recognized academic, pedagogical, or practitioner journals relevant to the COBA mission, or two peer-reviewed research articles and two (2) additional intellectual contributions from the list below within the past five years will be SA. Acceptable academic journals include those indexed by leading bibliographic sources or those readily available to

readers through research libraries and/or the internet. Or Faculty Members who have earned a research doctorate degree within the last five years will be SA. Or Faculty Members who hold ABD status are SA for no more than 3 years total with this status.

Practice Academics (PA). Faculty Members who have earned a research or non-research (less foundational disciplined-based or research-oriented) doctorate degree and have five years of professional experience that is relevant, current, and significant in duration and level of responsibility at the time of hiring will be PA. Or Faculty Members who have earned a non-research doctorate degree within the last five years will be PA.

Scholarly Practitioner (SP). Faculty Members who hold a master's degree relevant to the area of teaching from a recognized university, and have at least two years of professional work experience of significance and duration appropriate to the teaching area, and have at least three (3) intellectual contributions from the list below of which one (1) is peer reviewed within five years from point of hire will be SP.

Instructional Practitioner (IP). Faculty Members who holds a master's degree relevant to the area of teaching from a recognized university, and have at least two (2) years of professional work experience of significance and duration appropriate to the teaching area will be IP.

Graduate Faculty Members (GF). Must be SA or PA with doctoral degree and with at least two (2) peer-reviewed journal articles in Scopus/ABDC/Thomson Reuters (ISI) indexed journal in the last five (5) years.

6.3 External Challenges

External challenges that covers the following types:

- Reading Culture and Books Prices in Arab Countries
- Number of students in Public Universities.

Ongoing investigations have indicated fundamentally low perusing levels in the Arab world. The normal perusing time for an Arab youngster is six minutes multiyear contrasted and 12,000 min in the West, as per the Arab Thought Foundation's Arab Report for Cultural Development. The perusing rate of an Arab individual is a fourth of a page multiyear contrasted and 11 books in the US and seven books in the UK, as indicated by an examination led by the Supreme Council of Culture in Egypt.

VP and Prime Minister of the UAE and Ruler of Dubai, His Highness Sheik Mohammed bin Rashid Al Maktoum, on September 2015, propelled the "Middle Easterner Reading Challenge", the biggest Arab undertaking to

support understudies in the Arab world to peruse, with in excess of a million understudies resolving to peruse 50 million extracurricular books amid each scholastic year. In the other hand It realized that the Arab Countries yet thought about a piece of the third Humanity however the per capita monetary profit.

Most Arab nations did not in truth have close all inclusive proficiency in the 1960s, and a significant number of regardless them have high rates of lack of education today. (In Egypt a fourth of the populace was uneducated in 2013; in Morocco absence of education remained at 32% in 2014; the ascent to almost 90% proficiency rates in the nations of Persian Gulf is an ongoing wonder.) Obviously, this circumstance add to the obstructions that block the occasion of the book inside the Arab world and especially in Egypt.

Until the center of the twentieth century, ten colleges existed in the district, including the American University of Beirut (at that point called Syrian Protestant College), University Saint Joseph in Beirut, Cairo University (at that point called the Egyptian University), University of Algeria, and University of Damascus (at that point called Syrian University). With the decrease of authority European expansionism and the freedom of Arab nations after WWII, advanced education foundations and understudy enlistment immediately increased. While pre-freedom foundations were principally private and outside worked, post-autonomy colleges were to a great extent open, state-run establishments. Amid this period an unmistakable pecking order among scholastic orders was produced; understudies with higher evaluations in optional school were conceded into the science resources, while “weaker” understudies were put into sociologies, humanities, and Islamic examinations [21].

Insecurity, globalization, and a general monetary downturn in numerous Arab nations prompted new reformist patterns in advanced education starting in the 1980s and proceeding with today. The different change developments are bantered among the different partners (governments, neighborhood and outside organizations, understudies, natives), and go up against various qualities in every Arab nation. These (not generally effective) changes and patterns incorporate expanding privatization, calls for more prominent access, enhancing the capacity of colleges to meet the requests of society, coordinating instructive “yields” with work advertise needs, and arranging a focused worldwide training market [22].

There has been huge development in advanced education in the Arab world since the most recent long periods of the twentieth century.

Understudy enlistment has hopped from approximately 3 million understudies in 1998/99 to around 7.5 million understudies in 2007/08, while the quantity of colleges has developed just about three-overlay in a similar day and age.

Advanced education in the area has additionally drifted toward expanded privatization, however extensive contrasts happen between nations; Bahrain, Lebanon, Oman, Palestine, and the UAE have the most noteworthy level of understudies selected in private colleges (over 50%), while Iraq, Libya, Morocco, and Sudan have the least level of enlistment in private colleges (20% or less) [23].

Assurance of learning (AOL) is a pure AACSB expression and creation, it represents one of the AACSB standards and if the school wants to meet such standard, the first step is to be sure that the members of the accreditation committee and the faculty members as well are fully aware by the concept and the objective of the AOL. The same standard is included in the CAA-UAE accreditation standard, but it is not included in NAQAAE-Egypt, instead it has the Internal Quality System standard which represents one of the governor’s standards for the accreditation process.

The main goal for the AOL process is to demonstrate that students are achieving the program learning goals and to promote the continuous improvement of the programs. AOL not only provides the assessment data that allows us to demonstrate for the stakeholders that our students are learning what we intend for them to learn, but it also helps to ensure our stakeholders that we are working to improve student learning by using assessment data to identify areas in need of improvement and then taking actions to make those improvements.

The AOL process is overseen by the AOL subcommittee (usually serves under the Curricula improvement and accreditation committee), a committee that includes at least one faculty member from each department, the Associate Dean, and the Director of AOL. This body is the focal point of the AOL process and is tasked with review of assessment results, closing the loop analysis, and improvement action recommendations. In addition, faculty improvement teams may be formed to review assessments, propose program improvements, or conduct other AOL work as needed for the AOL Subcommittee.

The main AOL process can be summarized as follows; seen to have five stages:

- Establishing Course Learning Outcomes—that reflect national, expert and individual foundation necessities
- Curriculum Mapping—to distinguish chances to build up understudies’ capabilities as they advance through their course
- Collecting Evidence—with a specific end goal to show consistence to both interior and outer bodies including understudy overviews, cases of understudies’ work, and additionally execution information
- Closing the Loop—to empower nonstop through basic and intelligent discourse

- External Benchmarking—to benchmark against other instructive foundations contributions comparative degrees.

7 Comparatives Study

The main target of this section to clarify how the discussed challenges in the previous section can affect the organization’s achievements in the accreditation filed for both the national accreditation and the international accreditation as well. In the below case, the considered national accreditation bodies are CAA in United Arab Emirates and NAQAAE in Egypt. The international body represented by AACSB. The authors selected four different universities in each country. In United Arab Emirates three different Business Schools in have been chosen in addition to the business school in the American University in Sharjah, while in Egypt three different Business Schools have been chosen in addition to the business school in the American University in Cairo.

Seven different challenges have been selected to compare among the eight universities; Institutional Culture, Financial Issues, Enhancing the Program Quality, Suitability of Human Resources, Institutional Culture, Financial issues, Maintaining program quality, Suitability of human resources, Student’s Admission and Retention, Faculty Members Qualifications & Sufficiency and The Assurance of Learning Process.

By analyzing the below table, it is observed that, the key factors for the International accreditation are Faculty Members Qualifications and Sufficiency and Assurance of learning, out of eight business schools only three accredit on the international level. In other words, three schools out of eight maintain and strategically deploy participating and supporting Faculty Members who collectively and individually demonstrate significant academic and professional engagement that sustains the intellectual capital necessary to support high-quality outcomes consistent with the school’s mission and strategies. In addition, the three schools clearly define the categories of their faculty members’ qualifications and engagement; Scholarly Academics (SA), Practice Academics (PA), Scholarly Practitioner (SP), and Instructional Practitioner (IP) with the associated accepted percentages. Another critical factor is the assurance of learning which demonstrates the students achieving the intended learning outcomes for the offered academic programs. AOL in the three said colleges convince the national and the International accreditation bodies and the stakeholders as well that they deliver to their programs effectively to reach the proposed learning outcomes (see Table 1).

Table 1 Seven challenges were chosen to compare among the eight university, the status indicate the effect

	U1-UAE	U2-UAE	U3-UAE	U4-UAE	U1-EGY	U2-EGY	U3-EGY	U4-EGY
Institutional culture	YES	YES	YES	YES	YES	YES	YES	YES
Financial issues	Excellent	Excellent	Good	Excellent	Excellent	Good	Good	Poor
Maintaining program quality	Excellent	Excellent	Medium	Medium	Excellent	Excellent	Medium	NO
Adequacy of human resources	YES	YES	YES	YES	YES	YES	YES	NO
Admission and retention	High/High	High/High	Normal/High	Normal/High	High/High	Normal/High	Normal/High	Low/High
Assurance of learning	Exists/Effective	Exists/Effective	Exists/In-effective	Exists/In-effective	Exists/Effective	Exists/In-effective	Exists/In-effective	Not Exists/In-effective
Faculty Members Qualifications and Sufficiency	YES	YES	NO	NO	YES	NO	NO	NO
Local accreditation	YES	YES	YES	YES	YES	NO	NO	NO
International accreditation	YES	YES	NO	NO	YES	NO	NO	NO

8 Conclusion

The main aim of this article is to give a review of the issues identified with national and International accreditation norms inside the setting of the advanced education business colleges in the Arab Nations in large with more concentration on United Arab Emirates and Egypt. The mission and the key bearing of the business college and the fit with nay accreditation body will in extensive part decide whether to go ahead with the choice to look for accreditation the setting of the business college and its relationship to its partners gives a wonderful beginning stage to settling on the choice to look for accreditation or not. Distinguish the human, financial, and institution assets important to effectively meet the accreditation norms.

If the school decided to start the accreditation process to compete with the equivalent institutes, then all the components that required to be accredit should compared with respect to: (1) the institute mission and future strategic plans, (2) equivalent competitors. Hence the school should choose it peers who have the same programs, faculty, resources, and the same source of students to grantee the validity of the comparisons. The following step for the gap analysis is sharing the information and the alternative with the stakeholders to make the suitable decision and finally the board of trustees should take the decision for the sake of the school.

With the competitors, if the On the off chance that the establishment discovers that the essential explanation behind accreditation is to be on a “level playing field” with contenders, at that point the assets and exertion required to wind up licensed could in all probability be utilized for different purposes Peer organization examinations require not be constrained to a similar nation or landmass.

Recognize peer foundations that have comparative understudies, staff, and assets keeping in mind the end goal to make substantial examinations. Once the hole examination has been performed and benchmarks against peers has been made, the data can be utilized to illuminate chairmen, staff, and outer partners so all the key players can be engaged with the choice to look for the accreditation body.

The essential motivation to start the accreditation process is to review, maintain, and enhance the quality of the offered academic program from the institution. Extra advantages are gained in light of accreditation if the national or International body that recognizes the school by meeting the standards. The key factors for the International accreditation are Faculty Members Qualifications and Sufficiency and Assurance of learning, out of eight business schools only three accredit on the international level.

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Control Environment, Risk Assessment and Monitoring in United Arab Emirates Businesses

Hikmat AlRawi, Narcisa Roxana Mosteanu, and Ibaa H. Alrawi

Abstract

The objective of this study reflects an atmosphere conducive to the effective operation of the accounting information system and control activities in UAE business. An empirical survey using a questionnaire was carried out to achieve this objective. The case study taken into analyses is based on one hundred valid questionnaires were randomly distributed to different types of UAE businesses and subsequently collected. The collected data were analyzed using the statistical package for social sciences (SPSS) version 12 the survey results revealed a significant positive relationship within the variables: 1. Management Philosophy and Operating Style, 2. Organization Structure, 3. Methods of assigning authority and responsibility, 4. Board of Directors integrity and Ethical Values, Commitment to Competence, 5. Human Resource Policies and procedures, 6. Risk Assessment, and 7. Monitoring. The results also revealed that the applicable Control Environment, Risk Assessment and Monitoring Auditing of this paper. The results of the study will enable accountants and others in the profession to foresee risk assessments and monitoring internal audit for the success of businesses.

Keywords

Control environment • Risk assessment • Monitoring

H. AlRawi (✉) · N. R. Mosteanu
College of Business Administration, American University in the Emirates, Dubai, UAE
e-mail: hikmatalrawi12@yahoo.com

N. R. Mosteanu
e-mail: narcisa.mosteanu@aue.ae

I. H. Alrawi
Morocco University, Rabat, Morocco
e-mail: ibaa_alrawi@hotmail.com

1 Literature Review

A number of papers on Control Environment, Risk Assessment and Monitoring have been published. Differences of opinion have long existed about the meaning and objectives of ‘internal control’. Many people interpreted the term ‘internal control’ as the steps taken by a business to prevent fraud, both misappropriation of assets and fraudulent financial reporting. Others, while acknowledging the importance of internal control for fraud prevention, believed that internal control has an equal role in assuring control over manufacturing and other process [1]. Avens [2] discussed in detail the framework for establishing internal control, such as internal control—integrated framework issued by the committee of sponsoring organizations of the Treadway committee (widely known as COSO—Committee of Sponsoring Organizations). COSO developed in 1992. A component of internal Control become widely accepted framework in the United State and the word. These five components are: Control Environment, Risk Assessment, Control Activities, Information and Communication and Mentoring.

The economist Marshall describes how internal control should be thought of as a process by which a company’s management and employees keep the risks of the business within acceptable bounds [3]. The foundation of internal control is built with management’s own vision of the importance of controls. It is the process and structure used by management, under the guidance and oversight of a board of directors, to manage the risks inherent in the company’s business. Once a firm understands its risk appetite, it can build an effective control structure. The control structure can be thought of in terms of a pyramid, with its levels from top down being: 1. tone, 2. risk assessment, 3. management information, 4. control activities, and 5. monitoring activities. A few of Salomon Brothers internal audit concepts are presented: 1. Promote a learning environment. 2. Analyze incidents of control breakdowns. 3. Deploy internal auditors from varied disciplines. 4. Control is a firm-wide

responsibility. A firm can apply the internal control techniques to their derivatives activities just as they can to other business areas.

The economist Crawford identifies an internal control structure consisting of five elements: 1. control environment, 2. risk assessment, 3. control activities, 4. communication and information, and 5. monitoring. This was used as the starting point for a study by the University of Texas System Audit Office, which developed a model for internal audit practice [4].

Other contemporaneous economists investigate internal control systems as a tool for ensuring that an organization realizes its mission and objectives [5]. One technique for monitoring internal controls is the concept of control self-assessment (CSA). In CSA, the evaluation of risks and controls is performed by personnel responsible for the work under evaluation. The primary benefit of CSA is that it strengthens the internal control environment by involving operating units in the process. There are 3 primary CSA approaches being used by organizations today: 1. facilitated team meetings (workshops), 2. Questionnaires and 3. Management-produced analysis.

Hubbard note that internal controls systems help achieve business objectives and consist of 5 interrelated components: control environment, risk assessment, control activities, information and communication, and monitoring. Auditors can use this framework as an “agreement” with management about what to review in their audits [6]. The base of this agreement is the control environment, or corporate culture. Ethics and integrity are essential to the structure of corporate culture and examples of what have come to be called “soft controls”—intangible, difficult to verify, essential controls necessary to run any organization. Lack of soft controls, such as management philosophy, integrity, and ethics, increases the possibility that other, more traditional controls, such as approvals and reconciliations, may be overridden.

Myers consider that Internal controls are much more than just an assortment of checks and balances needed to produce financial information about a company [7]. Contractors need to understand that there are 5 technical areas that must be addressed to provide a safety net that can minimize serious risk, and possible failure and bankruptcy. The areas are control environment risk assessment, control activities, information and communication, and monitoring. Beyond the technical areas of internal control, a contractor needs to find ways to provide assurance over its financial reporting, to safeguard its assets, and to discern whether management’s directives are being followed through and acted upon. By using a variety of tools to examine contract cost information and by comparing actual costs to estimated costs and/or historical information, contractors will have a better chance of making sound business decisions. The control environment is the foundation of an effective system of internal

control. Most of the well-publicized failures (including not only Enron and WorldCom, but also the governance failures that led to the 2008 fiscal crisis) were, at least in part, the result of weak control environments. In the absence of a demonstrably effective control environment, no level of “design and operating” effectiveness of controls within business and IT processes can provide meaningful assurance to stakeholders of the integrity of an organization’s internal control structure (The Institute of International Auditor April 2011).

Singleton argues that companies are taking another look at their internal controls since the Enron disaster [8]. The first step in building an effective internal control environment is to make sure the organization has adequate, relevant policies, accompanied by an effective monitoring and reporting system to make sure management’s objectives are being met. Risk assessment is a critical step in building an effective internal control environment that has the ability to manage undesirable events, primarily because it strategically focuses attention on the most likely trouble spots with the highest costs rather than general protection. A critical success factor to an effective internal control environment is the employment of proven resources. Federal law and business wisdom require management to exert a conscientious effort to maintain an effective system of internal controls and to build a strong internal control environment. It is a critical success factor for all businesses.

Gauthier considers the concept of internal control is hardly new [9]. His article examines what every public sector financial manager and board member should know about internal control. COSO identifies five essential components that need to be in place to ensure that such a framework of internal control is adequate or comprehensive: 1. control environment, 2. assessment of risk, 3. policies and procedures, 4. communication, and 5. monitoring. While a sound framework of internal control is essential, it is important to bear in mind that no such framework can ever be perfect. Internal control, by its very nature, is essentially a managerial responsibility. Management is required to report on the effectiveness of the company’s internal controls under Section 404 of the Sarbanes-Oxley Act., COSO provides some guidance describing the following components of internal control: 1. control environment, 2. risk assessment, 3. control activities, 4. information and communications, and 5. monitoring. The utilization of an internal controls reliability model provides a framework for: 1. designing tests of control effectiveness, 2. evaluating the effectiveness of controls and 3. presenting and discussing findings with clients [10].

Economists Nelson Huen and Aslanidis [11] introduce Canadian Securities Administrators (CSA) Notice 52-313 made it clear that Canadian companies will not be required to obtain an internal control audit opinion on management’s

assessment of the effectiveness of internal control over financial reporting under Multilateral Instrument 52-111. The extent to which Canadian publicly traded companies subject to the proposed CSA regulations will document and test their internal control environment compared to those working within the Sarbanes-Oxley Act of 2006 framework is currently unclear. Outsourcing is definitely one of the potential risk areas that could materially affect the financial statements and potentially expose chief officers to regulatory action. There are three major initiatives you should undertake to help manage outsourcing risks: 1. Catalogue all outsourcing contracts and develop an outsourcing governance framework. 2. Consider the means of achieving compliance as part of contract negotiation. 3. Develop a rigorous compliance review and monitoring program.

In an operational risk management framework, Davies and Haubenstock state that risk indicators are one of the key tools used to support risk assessment and risk monitoring [12]. Risk indicators are a broad category of measures used to monitor the activities and status of the control environment of a particular business area for a given operational risk category. While typical control assessment processes occur only periodically, risk indicators can be measured as often as daily. Risk indicators help keep the operational risk management process dynamic and risk profiles current. As the use of risk indicators becomes integrated into a risk management process, indicator level/measures must have a frame of reference, commonly referred to as escalation criteria or trigger levels. These levels represent thresholds of an indicator or a tolerance that, when passed, require management to step up its actions.

Economists Sobel [13] and Chapman [14] cite Enterprise Risk Management (ERM)—the process of identifying and analyzing risk from an integrated, companywide perspective—as a business concept that has been circulating for several years. However, few companies have a clear picture of exactly what the process entails. Even fewer possess a solid plan for implementing ERM within their organizations. The COSO however seeks to change that position. COSO hopes to alleviate some of the ambiguity around risk with its latest study, Enterprise Risk Management Framework. COSO's ERM framework is broad enough to become widely accepted as a common reference point yet still ties into the COSO internal control model. The new ERM model consists of 8 components: internal environment, objective setting, event identification, risk assessment, risk response, control activities, information and communication, and monitoring. COSO's framework details eight components of risk management that make up an enterprise program: 1. internal environment, 2. objective setting, 3. event identification, 4. risk assessment, 5. risk response, 6. control activities, 7. information and communication, and 8. Monitoring [15].

Moody argues that many organizations are currently evaluating their ability to manage risk [16]. One tool that is expected to be helpful in this process is enterprise risk management (ERM). The Enterprise Risk Management Framework was developed to provide management with a common reference point with regard to ERM. As set out in the Framework, ERM consists of eight interrelated components. This relationship is depicted in a three-dimensional matrix, with the four objective categories—strategic, operations, reporting, and compliance—represented by vertical columns.

Harkness and Green explore some possible effects of e-commerce on auditing practices [17]. New audit risks and internal control considerations are identified and discussed. A secondary purpose of their article is to present a continuous auditing model that incorporates network security techniques, as well as to show how a typical audit can be conducted in an e-commerce environment. Harkness and Green addresses the traditional auditing model, annual and semiannual audits are conducted using current secure electronic transaction technologies to facilitate the collection and validation of electronic audit evidence. Alternatively, the continuous auditing model extends the functions of the traditional audit by using real-time transaction monitoring, accomplished using predefined auditing rules.

Hirte illustrates the SMART auditing emphasizes timely, effective, and proactive auditing techniques. SMART auditing focuses on the identification and periodic review of key indicators, such as operating statistics, key transactions, or account balance fluctuations. Four phases are involved in the process: 1. selecting areas to monitor and assess, 2. developing key indicators to monitor and assess, 3. implementation, and 4. maintenance of SMART auditing techniques. A proactive approach such as SMART auditing places the audit function in a position to identify quickly any potential control issues and operating inefficiencies that might result in significant loss or embarrassment to the company [18].

Matyjewicz and D'Arcangelo investigate how senior executives learn the importance of establishing objectives, identifying risks that will prevent them from meeting those objectives and establishing controls that will mitigate those risks [19]. The act requires controls to be assessed against a suitable framework such as the (COSO) Internal Control-Integrated Framework (IC-IF). The framework consists of 3 categories: 1. strategic, 2. operations, and 3. Reporting—and 5 components: 1. internal environment, 2. risk assessment, 3. control activities, 4. information and communication, and 5. monitoring. A similar tutorial on the enterprise risk management (ERM) found in more recent studies [20].

Paddock and Spayd develop five basic elements of internal controls that must be in place for an importer's regulatory-compliance program to meet the agency's

standards [21]. They include: 1. control environment, 2. assessment of risk for noncompliance, 3. written policies and procedures, 4. capture and communication of relevant information, and 5. regular monitoring. In short, thoughtful use of the Focused Assessment and Importer Self-Assessment (ISA) programs can provide importers with the opportunity to get ahead of the curve on compliance issues and, more importantly, to shape their relationships with Customs & Border Protection (CBP) in a way that will bring greater control over the regulated portions of their supply chains.

Shenkir and Walker formulate the COSO enterprise risk management (ERM) model focuses on 4 categories of objectives: strategic, operations, reporting and compliance. Eight interrelated components are: 1. internal environment, 2. objective setting, 3. event identification, 4. risk assessment, 5. risk response, 6. control activities, 7. information and communication, and 8. Monitoring [22]. The COSO ERM model requires executive management commitment for its rigorous implementation. Executing the Balanced Scorecard or other performance management system in conjunction with ERM enhances a company's ability to achieve its strategic objectives. Using a scorecard for the key risks identified in each of the value perspectives assigns accountability for managing the associated risks and serves as a valuable report for management. Risk management and the annual operating budgeting process can be integrated to provide valuable insights on what threats the leadership of a strategic business unit sees as challenges to achieving its financial plan. Also, economists Shenkir and Walker identifies known and unknown risks in companies using a variety of methods [22]. Some companies identify their risks using SWOT analysis (strengths-weaknesses opportunities-threats). Others run risk workshops composed of cross-functional teams that focus on objectives, products, or divisions. Another approach uses risk questionnaires to stimulate discussion. Other approaches include links to strategic plans and Balanced Scorecards, value chain analysis, process analysis, benchmarking, and scenario analysis. External consultants may also add value here by challenging the risk team and enhancing the risk identification process with an outsider's point of view. At the conclusion of any identification process, the organization should have its own unique risk language composed of all the major risks that the process identified. As part of the process, employees at all levels should reach agreement on the meaning of each risk identified.

Harkness and Green discussed the earlier preventive control points. In an e-commerce environment, preventive and traditional detection controls should be embedded in transaction processing systems [17]. This is analogous to the progress in total quality management, where quality

assurance based on inspection and rework has largely been replaced by the redesign of processes and products to eliminate the sources of defects [23]. More importantly, e-commerce causes the control points to occur earlier than before. In a merchandising company, for example, controls over payments of accounts payable should be accomplished by automatically reconciling the vendor's invoices with vouchers generated by the company's acquisition systems. The company then pays based on the trading partner agreements that have been built into the computer applications, which, in turn, automatically attach a "paid" mark to the vouchers. In this example, it would be inefficient for the company to use ex post detection controls such as manually calculating the extensions on the vendor invoices to determine whether the prices are correct. For companies to be successful in an e-commerce environment, preventive controls should be considered during the analysis and design stage of developing e-commerce applications [17].

2 Auditors Inherent Risks

The auditors face many potential inherent risks related to receivables and revenues. Many of these risks are derived from business risks that are faced by management, such as: Restrictions placed on sales by laws and regulations; Decline in sales due to economic declines, product obsolescence, increased competition, or shifts in product or service demand -Inability to collect receivables [1].

The risk of material misstatement also arises from the possibility of fraud. Improper revenue recognition has been the most common technique used by management to engage in fraudulent financial reporting. This is so much so that SAS 99, "Consideration of fraud in a financial statement audit," indicates that the auditors should ordinarily presume that there is a risk of material misstatement due to fraud relating to revenue recognition. If the auditors identify a fraud risk related to receivables and revenue, they will make sure that they understand the controls established by management to control the risk. They will also determine whether the controls have been implemented. Finally, the auditors will design their responses to the risks.

It is important to understand an organization's control environment. As an employee, you can understand the work Auditors can set out their responsibilities, identify the areas where special audit consideration may be necessary and assess the risks of misstatement in the financial statements. As an investor, understanding of control environment can help you to evaluate the risks of investing an organization. ng environment and management philosophy through understanding of the control environment [24].

3 Research Objectives

There are number of objectives to this study: to help the auditors evaluate the overall segregation of functions within the company; to identify the controls and weakness of the accounting cycle; to relate the controls and weaknesses to the various financial statement assertions about revenue and accounting receivable; to describe the various tests of controls that were performed by the staff of company to obtain evidence about the operational effectiveness of the control.

Based on recent studies [25], the committee reflects the work on Internal Control for the banking organization development by the Basle committee on Banking supervision which is a committee of banking supervision authorities established by the center bank governors of the group 12 countries in 1975.

The rest of the paper provides support for the auditors' assessed level of control risk to enable company's staff to arrive at the final assessed level of control risk as indicated at the bottom of the present paper.

4 Significance of Research

When obtaining an understanding of the overall internal control, company's audit staff first considered the elements of control environment, risk assessment, and monitoring as documented with the questionnaires at IC-3 and IC-4. As indicated on the questionnaire, they found these components to be strong for a nonpublic company and to reflect an atmosphere conducive to the effective operation of the accounting information system and control activities [1].

The Hypothesis: the study reflects an atmosphere conducive to the effective operation of the accounting information system and control activities.

Scenes 1992 until now, there are various question regarding the new framework COSO including the reasons why it was update; what has changed; the process for it use transitioning to it use and steps companies should take now [26]. And the framework has continued with many research papers and on.

The research findings help the accounting and auditing practitioner to identify appropriate solutions and effective accounting information systems and control activities in these businesses. The study helps the management and practitioner to identify the obstacles in the way of achieving suitable solutions.

To the knowledge of the current researcher, there have been no previous studies on dealing with Control Environment, Risk Assessment and Monitoring in United Arab Emirates (UAE) businesses. This is particularly true concerning the public sector which are experiencing conflicting

requirement from their governing body and resulting activities.

5 Research Methodology

The audit case of keystone computers and Network, Inc. (KCN) is investigated to illustrate the way auditors obtain an understanding of internal control, perform tests of controls, and assess control risk. The process is illustrated with the revenue and receipt cycle, and includes the following: 1. Management Philosophy and Operating Style, 2. Organization Structure, 3. Methods of assigning authority and responsibility, 4. Board of Directors integrity and Ethical Values, Commitment to Competence, 5. Human Resource Policies and procedures, 6. Risk Assessment, and 7. Monitoring. Target respondents in the following activates include top, middle and lower manager levels of decision.

5.1 Sample of the Research

A questionnaire was drawn up to evaluate the control environment, risk assessment, and monitoring components of the company's internal control. Since this questionnaire is designed for nonpublic companies, it does not address factors that are generally found only in public companies, such as an auditing committee of the board of directors [1].

The questionnaire was pre-tested through personal interviews with managing directors of many businesses. After testing an initial draft, the questionnaire was designed using a combination of scales taken from prior studies [1], and original questions based on issues uncovered in the exploratory study. This process resulted in several substantive changes to the control questionnaire.

5.2 Questionnaire Development and Sample Selection

A 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used. The questionnaire consisted of seven sections.

The first section (S.1) measured managers' perceptions, management philosophy and operating style that include the first four of this questionnaire, Management adequately, business risks adequately, overly aggressive, financial statement estimates.

The second section (S.2) assessed managers' perceptions of their organization structure, and sought a current organizational chart, policies and procedures, Policies and procedures adequately adhered in the questionnaire.

Table 1 Accountants employment position in the United Arab Emirates businesses sector based on 100 questionnaires

Employment position	Number
Lower managers	32
Middle managers	44
Top managers	24
Total	100

Note Based on the methodology presented above and the questionnaire settled in advance for the research

The third section (S.3) assessed managers' perceptions of methods of assigning authority and responsibility and sought information as to whether management had established and communicated policies, and system documentation.

The fourth section (S.4) focused on managers' perceptions about the integrity and ethical values of their Board of Directors, and its commitment to competence, including the level of experience of Board Members, whether they held regular meetings, took adequate action and demonstrated adequate commitment.

The fifth section (S.5) focused on managers' perceptions about Human Resource Policies and procedures. The questionnaire Sought to ascertain whether the entity employs sound practices, trained its staff adequately, evaluated performance, Positions of trust bonded, Positions of trust required.

The sixth section (S.6) focused on managers' perceptions about, Risk Assessment. The questionnaire sought information about the attention paid to external and internal factors.

The seventh section (S.7) focused on managers' perceptions about monitoring. The questionnaire that include key Management personnel, formal process.

One hundred responses were received from lower manager (to top result a total of close follow up resulted in 100%). Only simple descriptive statistical tools such as averages, percentages, and frequency and correlations coefficient analysis have been used to analyze the data. This approach allows the testing of the measurement of the Control Environment, Risk Assessment and Monitoring internal audit of the businesses.

Table 2 Accountants number of years of experience in the UAE business sector

Years of experience	Frequency number	Cumulative number	Percentage (%)	Cumulative percentage (%)
5–10 years	70	70.0	70	70
10–15 years	16	16.0	16	86
15 years and above	12	14.0	14	100
Total	100	100.0	100	

Note Based on the methodology presented above and the questionnaire settled up in advance for the research

6 Research Results

To understand internal control over accounts, the auditors must consider the various components, including: 1. Management Philosophy and Operating Style, 2. Organization Structure, 3. Methods of assigning authority and responsibility, 4. Board of Directors integrity and Ethical Values, Commitment to Competence, 5. Human Resource Policies and procedures, 6. Risk Assessment, and 7. Monitoring by applying the correlation analysis. The following tables present frequently distribution related to the research support

It is evident from Table 1 that the percentage of accountants carrying out daily jobs are in different position, in the Study. This is due to fact that they are more concerned with accountants follow up than others.

6.1 Management Philosophy and Operating Style

The accountants experience in the business sector it is presented in Table 2. The research observed that 70% have good and relatively extensive experience ranging from five years to less than ten years. 16% of the sample have experience of between ten and fifteen years, and 12% have over 15 years' experience. The author observed that the number of years of experience corresponded to the nature of the accounting systems fields entrusted to them, in addition to their ability to determine accounting fields (Table 3).

Table 3 Respondents' educational background

Educational certificate	Number	Percentage (%)	Accumulative percentage (%)
High school	44	44	44
Bachelor degree	28	28	72
MBA	28	28	100
Total	1000	100	

Note Based on the methodology presented above and the questionnaire settled up in advance for the research

Our analysis concluded that the most accountants are holders of high school certificates, representing 44%. 28% have Bachelor degree, and 28% have MBA Degrees. Management Philosophy and Operating Style, as indicated by its attitude toward financial reporting, is also important to the control of revenue and receivables. The relevant questions include: Management adequately, business risks adequately, overly aggressive, Financial statement estimates.

This section is concerned with examining the relationship between the variables of Management Philosophy and Operating Style by applying the correlation analysis. The Management Philosophy and Operating Style variables (Management adequately, business risks adequately, overly aggressive, Financial statement estimates) are the variables in the relationship with the topic. the correlation analysis shows that all of the Management Philosophy and Operating Style dimensions except Financial statement estimates were positively related to the to the overall score of the Management Philosophy and Operating Style variables were ($P < 0.01$). Specially, the strongest correlation of the overall score of The Management Philosophy and Operating Style were (Management adequately, business risks adequately, overly aggressive, Financial statement estimates) ($r = 0.691, 0.302, 0.264, P < 0.01$), with regard, significant positive relationship were found with all the dimensions of this topic except Financial statement estimates ($P < -0.136$). One possible explanation may be that, as revealed financial statement estimates are developed in a conscientious manner. These results were consistent with work of economists Whittington and Pany 2006 [1] who found these questions to be investigated.

6.2 Organization Structure

Another control environment factor is the entity's Organization Structure. It divides authority, responsibilities, and duties among members of an organization by dealing with such issues. A well-designed organizational structure provides a basis for planning, directing, and controlling operations.

This section is concerned with examining the relationship between the variables Organization Structure by applying the correlation analysis. Organization Structure variables

(the entity clearly defined, a current organizational chart, policies and procedures, Policies and procedures adequately adhered) are the variables in the relationship with the topic. The correlation analysis shows that all of the Organization Structure dimensions were positively related to the overall score of the Organization Structure variables was ($P < 0.01$). Specially, the strongest correlation of the overall score of Organization Structure were (current organizational chart, policies and procedures, the entity clearly defined, Policies and procedures adequately adhered) ($r = 0.790, 0.753, 0.622, \text{ and } 0.582, P < 0.01$). One possible explanation may be that, as revealed Organization Structure and it policies are the most important to risk assessment and monitoring. These results were consistent with work of economists Whittington and Pany [1] who found these questions to be investigated.

6.3 Methods of Assigning Authority and Responsibility

The primary objective of Methods of assigning authority and responsibility is to ensure that personal within an organization have a clear understanding of their responsibilities and the rules and regulations that govern their action. Therefore, to enhance the control environment, management develops job descriptions and clearly defines authority and responsibility within the organization.

This section is concerned with examining the relationship between the variables Methods of assigning authority and responsibility by applying the correlation analysis. Methods of assigning authority and responsibility variables (Authority and responsibility, Management has established communicated policies System documentation) are the variables in the relationship with the topic. The correlation analysis shows that all of the Methods of assigning authority and responsibility dimensions were positively related to the overall score of The Methods of assigning authority and responsibility variables were ($P < 0.01$). Specially, the strongest correlation of the overall score of Methods of assigning authority and responsibility were (Authority and responsibility, Management has established communicated policies System documentation) ($r = 0.601, 0.242, \text{ and } P < 0.01$). One possible explanation may be that, as revealed Methods of assigning authority and responsibility and IT policies are

has the entity developed an IT system documentation that indicates the procedures for authorizing transactions and approving systems changes. These results were consistent with work of economists Whittington and Pany [1] who found these questions to be investigated.

6.4 Integrity and Ethical Values of Board of Directors—From Commitment to Competence

The primary objective of the Board of Directors integrity and Ethical Values, Commitment to Competence is to establish a tone at the top of the organization that encourages integrity and ethical financial reporting. These ethical standards should be communicated and observed throughout the organization.

This section is concerned with examining the relationship between the variables of Board of Directors integrity and Ethical Values, Commitment to Competence by applying the correlation analysis. The Board of Directors integrity and Ethical Values, Commitment to Competence variables (Level of experience, Regular meetings, Taken adequate action, and adequate commitment) are the variables in the relationship with the topic. The correlation analysis shows that all of Board of Directors integrity and Ethical Values, Commitment to Competence variables were positively related to the overall score of The Board of Directors integrity and Ethical Values, Commitment to Competence variables were ($P < 0.01$). Specially, the strongest correlation of the overall score of Board of Directors integrity and Ethical Values, Commitment to Competence were (Regular meetings, Adequate commitment Level of experience, and Taken adequate action) ($r = 0.839, 0.713, 0.686, 0.497, P < 0.01$). These results were consistent with work of economists Whittington and Pany [1] who found these questions to be investigated.

6.5 Human Resource Policies and Procedures

With regard to Human Resource Policies and Procedures, management should make appropriate background checks of prospective employees and obtain fidelity bonds on employees in positions of trust.

This section is concerned with examining the relationship between the variables of Human Resource Policies and procedures by applying the correlation analysis. The Human Resource Policies and procedures variables (Entity employs sound practices, adequately trained, Performance evaluated, Positions of trust bonded, Positions of trust required) are the

variables in the relationship with the topic. The correlation analysis shows that all of 5. Human Resource Policies and procedures variables were positively related to the overall score of The Human Resource Policies and procedures variables were ($P < 0.01$). Specially, the strongest correlation of the overall score of Human Resource Policies and procedures. 18. Performance evaluated, 17. Adequately trained, and Entity employs sound practices, 9. Positions of trust bonded, 20. Positions of trust required) ($r = 0.818, 0.786, 0.719, 0.534, 0.531, P < 0.01$). These results were consistent with work of economists Whittington and Pany [1] who found these questions to be investigated.

6.6 Risk Assessment

The primary objective of the Risk Assessment involves identification, analysis, and management of risk relevant to the preparation of financial statements.

This section is concerned with examining the relationship between the variables of 6. Risk Assessment by applying the correlation analysis. The Risk Assessment (Officer attuned to external factor, Officer attuned to internal factor) is the variables in the relationship with the topic. The correlation analysis shows that all of 6. Risk Assessment variables were positively related to the overall score of The Risk Assessment variables were ($P < 0.01$). Specially, the strongest correlation of the overall score of Risk Assessment were (Officer attuned to external factor, Officer attuned to internal factor) ($r = 0.865, P < 0.01$). These results were consistent with work of economists Whittington and Pany [1] who found these questions to be investigated.

6.7 Monitoring

Ongoing monitoring activates by management primarily involve reviewing various type of reports, including sales by product line, by major customer, by geographic area, and by salesperson.

This section is concerned with examining the relationship between the variables of Monitoring by applying the correlation analysis. The Monitoring by applying the correlation analysis variables (key Management personnel, formal process) are the variables in the relationship with the topic. The correlation analysis shows that all of 7. Monitoring by applying the correlation analysis variables were positively related to the overall score of The Monitoring by applying the correlation analysis variables were ($P < 0.01$). Specially, the strongest correlation of the overall score of Monitoring by applying the correlation analysis were (key Management

personnel, formal process) ($r = 0.563$, $P < 0.01$). These results were consistent with work of economists Whittington and Pany [1] who found these questions to be investigated

7 Conclusions

This paper has discussed an extensive literature review and survey of Control Environment, Risk Assessment and Monitoring Auditing in United Arab Emirates (UAE) Businesses. Throughout the course of this study, it has been observed that the basic activities performed in the areas such as Control Environment, Risk Assessment and Monitoring Auditing include the following: 1. Management Philosophy and Operating Style, 2. Organization Structure, 3. Methods of assigning authority and responsibility, 4. Board of Directors integrity and Ethical Values, Commitment to Competence, 5. Human Resource Policies and procedures, 6. Risk Assessment, and 7. Monitoring.

In general, the correlation analysis between the internal variables of each one has shown the strongest positive relationship. However, the highest meaningful relationship found between their dimensions is the chief executive officer is attuned to external factor that affect the risk of achieving the entity's objectives ($r = 0.865$).

The lowest significant relationship found between their dimensions is the key Management personnel sufficiently are involved with operations to monitor the effectiveness of internal controls ($r = 0.563$).

Many possible explanations may relate to applicable control procedures that mentioned throughout the analysis. The following Table 4 is a summary of the main variables and sub-variable of the questionnaires, and their correlations.

The questionnaires and the results of this study appear to be adequate to provide an atmosphere conducive to the effective operation of other controls. Company's staff planned assessed levels of control risk at a lower level for completeness and at a moderate level for existence or occurrence, rights, and valuation.

Strategy and risk-focused organizations must also be identified, assessed, and managed in translating strategy to the operating units through the performance management system. Aligning various unit strategies to those of the entire organization is relevant because the risks of the individual units and the overall organization need to be understood and compared. ERM, like strategy, is everyone's job [27].

Due to recent advances in network technologies and the enhancement of cost-effectiveness by using Internet and World Wide Web applications, the development and practice of e-commerce have grown rapidly. Almost all major business activities across various business domains can be set up in the internationalized, virtual, and electronic business environment with the aid of Web-based transaction and payment mechanisms. The continuous auditing model extends the functions of traditional audit procedures by using real-time transaction monitoring, accomplished through the use of predefined auditing rules.

Table 4 Summary of research findings

Main variable	Sub variable	The most important part of the questionnaire	$P < 0.01$	Ranging
1.	2.	Business risks are adequately monitored	$r = 0.691$	
2.	6.	The entity has a current organizational chart and related material such as job descriptions	$r = 0.79$	
3.	9.	Authority and responsibility are to deal with organizational goals and objectives, operating functions and regulatory requirement adequately delegated	$r = 0.601$	
4.	13.	There are regular meetings of the board of directors to set policies and objectives, review the entity's performance and take appropriate action and are minutes of such	$r = 0.839$	
5.	18.	Employee performance is evaluated at regular intervals	$r = 0.818$	
6.	21.	The chief executive officer is attuned to external factor that affect the risk of achieving the entity's objectives	$r = 0.865$	The highest significant
7.	23.	Key management personnel sufficiently are involved with operations to monitor the effectiveness of internal controls	$r = 0.563$	The lowest significant

Appendix: Questionnaire

Control environment, risk assessment and monitoring

Position:	Low Mgt.	Middle Mgt.			Top Mgt.
Years in service:	5–10	11–15	16–20	21–25	26–30
Qualification (degree):	High School	Bachelor	Master	CPA	Ph.D.
1. Management Philosophy and Operating Style	Low 20%	40%	60%	80%	High 100%
1. Does Management adequately consider the potential effect of taking large or unusual business risks prior to doing so?					
2. Are business risks adequately monitored?					
3. Is management not overly aggressive with respect to financial reporting?					
4. Are Financial statement estimates developed in a conscientious manner?					
2. Organization Structure	Low 20%	40%	60%	80%	High 100%
5. Is the organization of the entity clearly defined in terms of lines of authority and responsibility?					
6. Does the entity have a current organizational chart and related material such as job descriptions?					
7. Are policies and procedures for authorization of transaction established at an adequately high level?					
8. Are such Policies and procedures adequately adhered to?					
3. Methods of assigning authority and responsibility	Low 20%	40%	60%	80%	High 100%
9. Are authority and responsibility to deal with organizational goals and objectives, operating functions and regulatory requirement adequately delegated?					
10. Has Management established communicated policies about appropriate business practices and conduct and conflicts of interest?					
11. Has the entity developed an It system documentation that indicates the procedures for authorizing transactions and approving systems changes					
4. Board of Directors integrity and ethical Values, Commitment to Competence	20%	40%	60%	80%	100%
12. is the level of experience, status and independence of the members of the board of directors appropriate for the organization					
13. Are there regular meetings of the board of directors to set policies and objectives, review the entity's performance and take appropriate action and are minutes of such meetings prepared and signed on a timely basis?					
14. Has Management taken adequate action to reduce incentives and temptations that might prompt employees to engage in dishonest, illegal and unethical Acts?					
15. Does Management exhibit an adequate commitment to competence in the performance of essential jobs within the organization?					
5. Human Resource Policies And procedures	20%	40%	60%	80%	100%
16. Does the entity employ sound practices, including background investigations, where appropriate?					
17. Are employees adequately trained to meet their Job responsibilities?					
18. Is employee performance evaluated at regular intervals?					
19. Are employee in positions of trust bonded?					
20. Are employee in positions of trust required to take vacations and their duties rotated while they are on vacation?					

(continued)

6. Risk Assessment	20%	40%	60%	80%	100%
21. Is the chief executive officer attuned to external factor that affect the risk of achieving the entity's objectives?					
22. Is the chief executive officer attuned to internal factor that affect the risk of achieving the entity's objectives?					
7. Monitoring	20%	40%	60%	80%	100%
23. Are key Management personnel sufficiently involved with operations to monitor the effectiveness of internal controls?					
24. Does management have a formal process for considering reportable conditions from external auditors?					

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Creative Contributions and Solutions to Dubai's Challenges and Commitments as a Smart City: Transnationalizing and Personalizing Global Standards of Excellence in International Education

Konrad Gunesch 

Abstract

This paper contributes to the higher education system of Dubai as a Smart City given its public commitment to equating “excellence” with “global”. It substantiates and enriches global standards of excellence transnationally by adopting as global educational standard of excellence the concept of cosmopolitanism as the global individual cultural identity form of world citizenship, which finds increasing acceptance in international education theory and practice. Cosmopolitanism suits both the “excellence” and the “global” parts of Dubai’s commitment, since it is at the same time, a classical idea and a modern-day concept, a timeless philosophical ideal and a call for practical initiatives, a combination of local, national, regional, national international issues, and an incentive for individual and institutional inroads. Conceptually, cosmopolitanism is presented as a synthesized literature matrix complemented by substantial critical thinking. Empirically, it is shown how a group of highly multilingual international students revealed themselves, in in-depth interviews, in terms of their cosmopolitan identities. This allowed the analysis and synthesis of three new ideal types of cosmopolitans beyond the literature. The paper therefore (1) adds educational dimensions to Dubai’s Smart City character, (2) introduces new, transnational dimensions for global educational standards of excellence, and (3) makes innovative, recently tested frameworks available for individuals and institutions. Correspondingly, future research could (1) apply the results to other smart cities and their countries, (2) test further dimensions for global educational standards of excellence, (3) investigate causal relationships between language mastery and global identity, or use more quantitative methods or larger empirical samples.

Keywords

International education • Social innovation • Global standards of excellence • Cosmopolitanism • Dubai • Smart city

JEL Classification

D83 • I23 • O35 • Z13

1 Introduction

1.1 Global Standards of Excellence in Education

Global standards of excellence are sought to be introduced in education in various contexts, yet often unspecific in theory and practice. For instance, for “faculty internationalization”, recent literature stipulates merely that “for systems on the periphery...the central questions are how to best offset barriers to importing foreign talent and know-how and how to expose an increasing proportion of their citizenry to global standards of excellence”, before asking: “What levers at the national government and institutional levels are available? How can they be exploited optimally given resource and cultural constraints?” [1].

According to a critical view of neo-liberalist higher education, often expressed in similar terms by the same authors [2–6], education and society suffers these effects on a global level, among others: “globalization of schooling and higher education curricula, global standards of excellence, globalization of academic assessment, global academic achievement syndrome, global academic elitism and league tables, positioning of distinction and privilege, [and] global marketing of education”.

Others share this critical view of neoliberalism and express it in a discourse of combined intellectual and economic power structures, namely that “neoliberal globalization has reinforced the core-periphery structure that

K. Gunesch (✉)
American University in the Emirates, Dubai, UAE
e-mail: konrad.gunesch@ae.ae

characterizes higher education worldwide”, where “a small number of elitist universities in both the North and the South...operate as national, regional and global ‘hubs’ of higher education, allowing for the widespread circulation of global standards of excellence inscribed within market principles” [7].

1.2 Global Standards of Excellence in Education for the Region and the UAE

Some recent literature voices [8] highlight the connection between the four elements of “Excellence”, “Education” for the entire Gulf Region, focusing among others on the country of the United Arab Emirates and the city of Dubai, especially with respect to its “Smart City” aspirations and programs. However, they also critically suggest that much of that connection might exist foremost on a rhetoric or marketing level:

The overabundance of excellence rhetoric in does indeed yield the impression that the Gulf has become the prime example for the culture of excellence. The *International Indian* writes that ‘Education and Excellence go hand in hand in the UAE’... There is a ‘Dubai Government Excellence Program’ for education... ‘Excellence initiatives’ all over the territory offer seminars like the ‘Dubai Achieving Excellence in Higher Education Seminar’... Most universities in the Gulf have a Center for Excellence, which can also be called ‘Center for Excellence in Teaching and Learning’, ‘Center for Excellence and Distinction’, or ‘Center for Achievement and Excellence’... In the UAE, ‘excellence’ is, together with ‘global’, the most used term while marketing universities to potential customers... In a country where Prime Minister Sheik Mohammed bin Rashid Al Maktoum has named his own book *My Vision: Challenges in the Race for Excellence*, universities need to follow the call. Maktoum’s vision of Dubai as a Smart City... seems to be intrinsically linked to the Gulf culture of excellence.

Yet the same literature voices also put forward incisive and sweeping criticism [8]:

In general, the educational environment is substandard, with an education development index putting, for example, Abu Dhabi on place 90 out of 125. The ambition to become a knowledge-based economy clashes with the fact that, according to the World Bank (2007), the knowledge economy had shrunk since 2005.

1.3 Global Standards of Excellence in Education for Dubai as a Smart City

Thus, while largely remaining critical of the current level of global standards of excellence in the Gulf region and country of the United Arab Emirates, the cited literature also seems to suggest and concede the special potential of the city of Dubai.

This corresponds firstly to literature pointing out the educational element in characteristics of smart cities, either mentioning “smart education” directly [9], or elaborating that “smart cities can...be studied in terms of...characteristics like city administration, education, healthcare, public safety, real estate...transportation [and] utilities” [10].

In continuation and special local focus of the education element, this corresponds to further literature voices highlighting the specific and unique connection between Dubai’s “Smart City” Strategy and the sector of “Education”:

Most societies find it time-consuming and expensive to find suitable experts. Smart education should deliver on this objective... You can see how Dubai has attracted people from the world in a short period of time because they had money to bring the best [11].

Smart Dubai Strategy: Dubai Government has a well-articulated smart city strategy in line with the UAE strategy for the future to be implemented in 3 phases; short, medium and long-term... As part of the strategy, future prototypes for sectors include healthcare, education, social development and the environment are under development [12].

On March 4, 2014, Dubai’s smart city strategic plan was launched [with] six dimensions envisioned for Dubai’s smart city [among which was] accessible education [13].

Our research aims at contributing to each of these levels discussed in the literature: by first conceptually proposing and outlining, then empirically testing and proving, and finally practically offering and advancing cosmopolitan cultural identity as a global standard of excellence in international education that is locally relevant and applicable, we will combine the levels of the world (global citizenship), of the region and of the country (the Gulf Region and the United Arab Emirates), and of the city of Dubai (focusing on its challenges and potential as a Smart City).

Given the recent literature’s stress of education being a sector under special development and care of Dubai’s Smart City Strategy, we now look at cosmopolitanism as a global standard of excellence in education, and then as a relevant component according to the academic literature on international education. Below we already suggest the several levels of contribution of our conceptual framework and empirical research that will be detailed in the conclusions and recommendations.

1.4 Cosmopolitanism as a Global Standard of Excellence in Education

Our proposed model of cosmopolitan individual cultural identity would avoid the shortcomings of globalization, hemispheric elitism, economic exploitation, or institutional competitiveness, as outlined below. Hence this paper would like to suggest the concept of cosmopolitanism as a global individual cultural identity form of world citizenship, based

on its increasing currency in the literature of international education.

By way of a summative preview, our model of cosmopolitanism avoids the cultural uniformity of globalization and the economic hegemony of neoliberalism. It is not predicated on institutional settings and therefore immune from elitist or exploitative differentiations, and it avoids national political, economic or social differentials by focusing on an inclusive, however culturally discerning, world citizenship and individual identity form.

1.5 Cosmopolitanism as a Relevant Component in International Education

According to a leading scholar in the field of international education, “arguably of relevance in any consideration of the concept of international education is that of cosmopolitanism”, before she quotes this author and some of his previous writings [14]. Others generally point out the “growing relevance of cosmopolitanism today and in the foreseeable future” [15]. From the pedagogical side, recent literature increasingly links cosmopolitanism with educational approaches, exemplified by work such as [16, 17] or [18].

However, these authors share rather institutionally mediated approaches, reflecting some of the criticism of global standards of excellence in education, while this article takes a more personally centered approach. For instance, just the international education literature trying to define “international”, “internationalism” or “internationalization” is already vast (see [14, 19–22]).

Furthermore, international education research centers mainly on the nature and the management of international schools or curricula (see [23, 24]). Hence even concepts such as “being international”, “international-mindedness” or “international attitude” are part of institution-bound investigations (see [19, 22]).

By contrast, our suggested cosmopolitan model is an individual identity form, reflecting “the fact that the world is small, fragile, and its inhabitants increasingly dependent on one another...has also made it imperative that international educators ... focus on issues and problems that are trans-national and trans-cultural” [20].

The robustness and practical applicability of our cosmopolitan model was tested and confirmed by a group of students as being relevant to their personal cultural identity and produced patterns of “cosmopolitan responsiveness” which enabled me to synthesize three “cosmopolitan ideal types”, labelled “Advanced Tourist”, “Transitional Cosmopolitan”, and “Interactive Cosmopolitan” [25].

The below conceptual framework of this model is followed by the empirical investigation with multilingual students, before suggestions of how the combination of theory and practice might serve global standards of excellence in international and especially transnational education, which by their nature are potentially applicable both on the level of the whole world as well as on a national level for a country such as the United Arab Emirates, and finally linking these insights specifically and locally to Dubai’s commitments and challenges as a Smart City.

2 Conceptual Framework

2.1 The Concept of Cosmopolitanism

History and Transdisciplinarity. Historically, cosmopolitanism has been especially intensely debated during the time of the Greek Stoics of the 1st and 2nd century BC, in the seventeenth/eighteenth century, and since the 1990s (see [26–29]). Multiple possible definitions across various disciplines have changed over the course of those historical periods (see [15, 30–32]).

Our concept of cosmopolitanism is a literature synthesis in form of a topics matrix that has further been enriched by considerable critical thinking, describing a contemporary cultural individual identity form relevant for today’s students, and to serve as guideline for global standards of excellence. As such, it should be especially relevant to a city with the ambitions of furthering its status of a global metropolis like Dubai.

At Home in the World. Cosmopolitanism comprises a “feeling at home in the world” (see [33]), or an interest in or engagement with cultural diversity by straddling the global and the local spheres in terms of personal identity, with one foot in each sphere, finding a balance in which the global is decisive without having to dominate all the time.

Global-local Continuum. While persons that we typically see as “locals” may not be interested in cultural diversity, “cosmopolitans” consciously value, seek out and try to access local cultural diversity (see [34, 35]). This could be visualized as a continuum along which the cosmopolitan can advance, and which also serves to distinguish between different cosmopolitans with respect to their local competences, as well as between different degrees of competence (from one local culture to another) within the same cosmopolitan person.

Openness and Engagement. A key characteristic of cosmopolitanism is “a willingness to engage with the Other, an...openness toward divergent cultural experiences” (see [36, 37]). Yet the individual cosmopolitan, while able to

engage with a local culture, is free but not obliged to endorse that culture positively, either in its entirety or with respect to components of it.

Effort and Elitism. Cosmopolitanism might require personal effort. [38] calls it “finding joy and strength in overcoming habitual limits”, giving examples of poets and writers struggling to acquire or express themselves in their foreign language. One could see cosmopolitan effort as requiring all the personal resources aspiring to elements of the cosmopolitan matrix.

As for elitism, [33] puts forward “the unalloyed goodness of the ‘cosmopolitan’” and argues that “in the English language, its connotations have been relentlessly positive: ‘free from provincial prejudices’, ‘not limited to one part of the world’, ‘sophisticated, urbane, worldly’”. Some characterize cosmopolitans as “people with credentials, decontextualised cultural capital” (see [34, 39]), while some see “intellectuals” as typical examples of cosmopolitans and in turn naming intellectuals at the same time as the typical example of transnational professionals [40].

This might be a highly interesting and relevant aspect of global standards of excellence, given that for our empirical sample, multilingualism was the key selection criterion as shown below. Within the Arab world, Dubai arguably has a unique position given its international influx of investment and resulting influence on many levels, which is in turn expressed in many of its features, one of them its widespread use of outside educational systems (such as international universities), or the adoption of the global lingua franca (English), as the medium of communication in many contexts.

Traveling and Tourism. Cosmopolitan traveling is indispensable for first-hand experiences of cultural diversity (see [41, 42]), yet only if combined with “connaissance” (connoisseurship) and a cultural engagement that differentiates it from mere tourism (see [39, 40]). “Typical tourism” is often limited to holiday stereotypes and cultural clichés with respect to the target culture (see [38, 43]). This could likewise be considered a continuum, showing individuals between stages of tourism towards stages of cosmopolitanism.

Home. For the cosmopolitan, “home” might not necessarily be the “home culture” any more, but take on an entirely new meaning (see [34, 36, 39]), or combine several locations or perceptions of home, while it logistically probably cannot be just about “everywhere”. Our empirical part sheds new light on the array of cosmopolitan homes, specially mediated by the linguistic abilities of our interviewees.

Again, Dubai being unique worldwide as the (first or second) home of many expatriates who are in the majority compared to the native population, make this matrix issue highly suitable in the context of its smart city character.

Nation-State Relationship. Due to the etymological classical Greek origin of *kosmou politês*, “citizen of the world” (see [26, 27, 44, 45]), some reject any cosmopolitan attachments or loyalties beneath an all-encompassing global humanity. A “rooted cosmopolitanism, or...cosmopolitan patriotism” [46] stresses loyalties and ties to smaller geographical or cultural entities, such as nation-states, local communities, or families.

Transnationalism. Already etymologically the concept of internationalism (as “between and among nations”) cannot easily explain (as can the cosmopolitan “feeling at home in the world”) why a person’s home might be *outside* of one’s nation-state, or in several parts of the world. Likewise, cosmopolitanism can easier capture cultural issues below or above the nation-state, such as small-scale local cultural diversity, like regions or cities, or overarching identities covering the entire world. This gives cosmopolitanism a far more transnational character than internationalism, and makes it more suitable for defining and aspiring to a global standard of excellence in education characterized by transnationalism.

Globalization. While globalization is associated with cultural uniformity [47] just as much as with diversity [48], cosmopolitanism actively seeks out diversity. Also, the globalization debate started only in the 20th century (see [48, 49]), while cosmopolitanism’s historical roots, as shown, are much longer.

2.2 Literature Summary

The following main areas of personal concern or engagement for a cosmopolitan can serve as a reference for the empirical investigation below, but also as a catalog summary of global standards of excellence for a person interested in transnational higher education:

- (1) A straddling of the “global” and the “local” spheres as a world citizen;
- (2) A “connaissance” (connoisseurship) regarding local cultural diversity;
- (3) A general willingness and openness towards that cultural diversity;
- (4) A possible sense of personal effort to achieve a cosmopolitan identity;
- (5) The mobility to travel, just not only with a “typical tourist” attitude;
- (6) A notion of “home” that can be extremely varied, just not everywhere;
- (7) A nation-state attitude between “rooted” and “unrooted” identity;

- (8) A transnationalism beyond inter-nation-state limitations; and finally,
- (9) A globalization attitude favoring cultural diversity over uniformity.

As we have seen, many of these areas of concern align with the educational environment strongly represented in the locality of Dubai, as well as with its smart city characteristics and aspirations.

3 Method

3.1 Methodology

Out of an overall sample of forty-eight international, post-graduate students at the University of Bath in England, pre-chosen for their multi-linguistic ability and competence, I further chose the eleven most multilingual ones via a self-assessment questionnaire of each one's language learning history and ability, determined along quantitative and qualitative criteria that required advanced working knowledge in at least three foreign languages beyond the mother tongue. This was based on literature definitions requiring the mastery of "at least three foreign languages" beyond the mother tongue [50], while conceding that in such scenarios "it is inappropriate to expect near-native speaker competence" [51]. This resulted in all the interviewees mastering between three and five foreign languages on an advanced working knowledge level in all four skills of reading, writing, listening and speaking.

Location-wise, the sample might have been *convenient*, but it was not a "convenience sample" due to this focus on the students' linguistic abilities. Furthermore, their high nationality variety (with 11 different nationalities for the second stage of 24 interviewees, and still 7 nationalities for the final stage of 11 interviewees) reflects the international makeup of the Dubai student and expatriate population. Finally, the quality of postgraduate studies in a British university environment being globally recognized, and *The Guardian University Guide 2018* ranking the University of Bath as the 5th Best University in the United Kingdom (preceded only by Cambridge, Oxford, St. Andrews, and Durham), the gained insights and results are valuable for applying them to Dubai regarding its aspiration as a Smart City.

The sample choice also reflects that the literature on the identity of multilingual persons is mostly unrelated to cosmopolitan identity. Authors merely find that they are "acquiring a different cultural identity in every language" [52], or that they "have a richer repertoire of linguistic and cultural choices and could fine-tune their behavior to a greater variety of cultural contexts" [53].

Only two writers describe their linguistic identities in plastic but still basic terms, such as "strata" or "layers of a cake" or of "an onion" (see [54, 55]). Overall, more research is needed on the identity of multilingual persons (see [56, 57]). Only one author links cosmopolitanism to linguistic development, giving examples of writers and poets such as Vladimir Nabokov who learned and prominently used foreign languages in their works [38], but taking for granted that his sketchy cosmopolitan model has a lot to do with language learning.

Hence our interviews were exploratory, in-depth, semi-structured, open-ended, and covert in that the topic of "cosmopolitanism" was not given away to them, so that it could be explored and expressed in a non-guiding manner to ensure full validity for any established links between the multilingualism of the interviewees and their revealed cosmopolitan personal cultural identity.

3.2 Empirical Analysis

With the student interviewees expressing themselves freely about their language attitudes, against the background of the cosmopolitan literature matrix categories, which were treated as interpretive and flexible tools rather than fixed categories, it was possible for a pattern of three broad ideal types of (multilingual) interviewee profiles to emerge, which I called "Advanced Tourist", "Transitional Cosmopolitan", and "Interactive Cosmopolitan":

- (1) Even if the advanced tourist is not the "simple tourist" of the literature any more, some interviewees revealed functional mastery concerns, consumerist attitudes, or national identities to degrees which limited their willingness to engage with the diversity of target cultures.
- (2) The transitional cosmopolitan is located somewhere between the tourist and the cosmopolitan on the continuum, but developing over the matrix categories towards the third type, the interactive cosmopolitan.
- (3) The interactive cosmopolitan reveals advanced forms of interactive and integrative behavior and mindset, fitting the ideal-typical literature requirements for a cosmopolitan, especially by displaying an open-minded, flexible, self-critical, as well as giving or sharing attitude.

3.3 Empirical Synthesis

These three ideal profile types were then compared to each other via an empirical *synthesis*. To show both the elements of the analysis and of the synthesis, each below quote, as a paragraph, corresponds to an individual interviewee

statement; several stacked quotes serve to highlight the nature and process of the empirical synthesis.

4 Empirical Application

4.1 The Advanced Tourist

The advanced tourist's identity dimensions center on local, regional, or national dimensions, and despite declarations of openness and worldliness, the emotional inner world reveals parochial or local limits with respect to the matrix issues of "identity dimensions" or "home":

First of all I'm Basque, and afterwards a European. I don't know; my European feelings haven't been very developed yet.

The advanced tourist stresses more than the other two ideal types the professional usefulness of language learning, which suggest the advanced tourist being a prototype of "transnational occupational cultures" (see [34, 39, 40]):

I think why I chose Spanish is especially because...Latin America is for Political Scientists a very interesting field of study...This was more utilitarian, to have more possibilities afterwards with the language...to find a job, in the now uniting Europe or in a job market that is getting more international every time.

Especially relevant for the city of Dubai, this type might represent many of its international inhabitants (students, professionals, or temporary visitors) who could be characterized (even by themselves) as being located and living there mainly for work reasons, but without trying to identify with the surrounding culture beyond their professional requirements. While not a personal value statement, and in common with expatriates in other global metropolises, it nevertheless differentiates the representatives of this ideal type decisively from the following two, the transitional and especially the interactive cosmopolitan.

4.2 The Transitional Cosmopolitan

Transitional cosmopolitans, on the continuum between the advanced tourist and the interactive cosmopolitan, might for instance profile as still advanced tourists regarding certain matrix issues, such as the question of home, where national and even local attachments prevail, with wider attachments only established exceptionally:

I tend to live wherever I go...It's where you are brought up, where you had your first friends, and where you live, where your parents' house is...But then, you have other parts of the world where you feel very comfortable as well...Madrid...became my second home...It usually doesn't happen...but when it happens, it's something exceptional.

On the other hand, transitional cosmopolitans can have a very cosmopolitan attitude towards their (native) nation-state, with foreign sympathy triggering compatriot criticism:

The nation-state makes you homogeneous, and makes you patriotic, and gives you myths, gives you symbols, and gives you a whole set of ideas which are not very helpful if you want to live as a global person, and not as an ethnocentric person.

I have been treated as a xenomaniac [sic] by my friends sometimes... The fact that I can criticize Greece, it means that for them [the Greeks] I am a little bit of a foreigner.

This ideal type might for instance represent many expatriates in Dubai who, beyond their immediate professional needs, genuinely attempt to engage and identify with their surrounding cultural environment. In the process, they might experience similar situations or feelings of estrangement as expressed by our interviewees. They might thus be on the way or, in our terminology, be moving on the continuum in the direction towards developing into a fully-fledged interactive cosmopolitan.

4.3 The Interactive Cosmopolitan

The interactive cosmopolitan is the most open-minded, flexible, holistic and giving of the three ideal types, substantiating and contributing to core literature on cosmopolitanism. This type also has the most widespread and intensive linguistic mediation of vital matrix categories. For interactive cosmopolitans, languages are much more pervasive and important. For instance, they substantiate and personalize the link between multilingualism and cosmopolitanism by rephrasing and substantiating the key aspect of "effort" in one of the most advanced literary concepts of cosmopolitanism, namely [38]'s "finding joy and strength in overcoming habitual limits" in linguistic terms, when overcoming linguistic insecurities and learning stages:

[Learning and keeping up Dutch] was always kind of like a struggle, it was always hard to maintain, somehow. But...I could find out something that was beyond my limits...Through improving your language...you always go a step further.

I would really look forward to that [being in a culturally completely unfamiliar environment], if I could. When I went to Morocco...I was just so amazed...that...it was just totally different...a bit uncomfortable, but because I couldn't speak the language.

I would be curious [in that culturally unfamiliar environment], nosy, would like to get to know...and would look for the keys... Keys being...language as a main source...Of course it's also again feeling insecure, feeling incapable...but I think the feeling, or the eagerness of wanting to cope would be higher, or weigh more.

The interactive cosmopolitan's linguistic mastery enables a highly open, interactive and two-way cultural access and

engagement, culminating in critical reflection about the own country and culture:

[Languages] mean the opportunity of learning...Not only learning about people...It also would inspire your personal view of things. It makes you more open...It makes me feel more that I know where I'm going, and getting to know people better.

If I travel, I like to talk with people, and to learn something about their country and to learn then something about mine... Language learning...it's a way of education, it's a way of learning not only more about other cultures but also about yourself...You can anticipate to give something.

The more interactive a person is, the more the professional and the private aspects of learning and using languages become intertwined, ranging from functional or professional over mind-set and worldview, up to aesthetic issues and considerations:

In contrast with European languages, you see that there are other systems, other ways of indicating things. For instance...my first inclination [of interest in Arabic] was because of the artistic way of writing. It's really like a piece of art...It's a beautiful language.

Interactive cosmopolitans concede a "foreign identity" but refuse to substantiate it linguistically, yet they allow themselves to be taken into "another sphere" when using certain languages. This is almost on a par with the "strata", "layers" or "onions" dimensions described by two authors on the identity of multilingual persons (see [54, 55]):

I act differently when I speak Spanish. I'm more in the Spanish way of life. A bit more open, I'm more eager to say personal things...Maybe because values, education, family, and so on, brought with them, aren't established in my Spanish identity. Spanish identity, of course is an exaggeration, but when I speak Spanish...Of course I have several identities, but you can't stick to the languages.

Speaking with a Dutch person carries me into another sphere. So, kind of this cake [of my identity dimensions] changes and shifts, like from context to context...But a piece of it is definitely always Dutch...It's another way of seeing, of perceiving, I think...of being aware of yourself and of other people.

For an interactive cosmopolitan, language knowledge is an essential and indispensable factor for feeling at home, indeed a matter of global identity, where languages serve as a passport or qualifier to access and cope in foreign environments:

Knowing the language well doesn't make you feel at home. But you cannot feel at home unless you know the language.

The language, that is necessary to cope in the [everyday] situations, is a basic factor of feeling [at] home.

Finally, the interactive cosmopolitan's picture of "home" is highly differentiated, multi-dimensional and complex, strikingly reflecting Hannerz's alternatives of "a privileged site of nostalgia", or "a comfortable place of familiar faces, where...there is some risk of boredom" (see [34, 39]).

"Home" can also be different according to geographical context, in complex diversity of dynamic interactions, embraced with an open attitude, or involving multi-sensory perceptions:

[Home:] How boring, at first. But of course, it's more than that...The word 'home' is 'stick to the same place', and I would like to move a lot...I would like to say that it is an uninteresting concept, but I still have some nostalgia towards home.

It [home] means people I relate to...But it's not something where you're born. It is also where you're born, but other home places accumulate... It captures all of your senses, it's what you see, it's also what you smell...Then again it depends on the context...I would say that "a home" is a place where I can live any mood, a range of different situations.

The richness of linguistic and cultural identification, interactivity, engagement and exchange with the target culture makes this arguably the most interesting (and commendable) of the three ideal types for the city of Dubai (or for any global city, for that matter). The interactive cosmopolitan would be willing, for instance (as relatively few expatriates are in the Arab culture, faced with seemingly daunting difficulties), to learn as much as possible about the linguistic and cultural background they live in. The above student who expressed interest in the Arabic language needed only the esthetic value as a good enough reason for intensive engagement, while the one expressing the multi-dimensionality of home did so, incidentally, when speaking about multi-sensory experiences in public life in Egypt and the city of Cairo with its souks and bazaars, pointing out local sights and smells. These are surely degrees and depths of willingness and readiness towards local cultural engagement that one could only wish for any global city, and therefore can only support its educational element and standing, and as such their position and aspiration as a smart city.

5 Conclusions and Recommendations

5.1 Cosmopolitanism as a Global Standard of Excellence for International Education

Regarding global standards of excellence for *international* education, our research can thus be understood and utilized on several levels:

We have shown how foreign language learning is perceived in international higher education, by studying multilingual students' revelations of their individual cosmopolitan cultural identity, who have proven themselves as citizens of the world.

Our research's limitations, such as sample size, exploratory research, or number of languages investigated empirically, therefore can only invite further investigations, for

instance widening the sample size or the cultural origins of the research participants, adding more quantitative elements, or including languages other than those of European origin.

Our results can then be taken as a motivation, prescription or recommendation for individual educational efforts, or for more wide-ranging, coordinated considerations, on various educational levels, nationally and internationally. Also, as a notion more tailored towards individual substantiation and realization, it could considerably motivate and empower students and learners.

Further, the model of cosmopolitan cultural identity can enrich international education efforts and considerations, because certain educational objectives that have long since been idealized yet rarely accomplished in world citizenship education might be easier reached with the cosmopolitan principles of cultural diversity paired up with engagement and knowledge.

Additionally, the notion of cosmopolitan *continua* can accommodate multiple personal educational agendas. Identifying and moving oneself along one of these continua would be educationally concrete, measurable and motivational, substantiating the calls for more “global thinking and local acting”, but also opening a whole yet literally “straightforward” developmental pathway, to even graphically show in which direction and *to what extent* we are improving.

5.2 Cosmopolitanism as a Global Standard of Excellence for Transnational Education

Regarding global standards of excellence for *transnational* education, cosmopolitanism has been shown to embrace the notion of internationalism, but also to transcend it rather easily, thereby being able to enrich it, and with it all individual efforts at creating a more “international” spirit, understanding or identity:

While “international education” and “understanding” have hitherto focused mainly on “internationalism” and within institutions, these limitations could be challenged by cosmopolitanism as related to the individual learner, based less on an educational context such as a particular type of school, but rather on a clear conceptualization of the outcomes in terms of “identity” or “the individual”.

For instance, a “world citizenship as individual engagement with cultural diversity” might even be more suitable for the individual than just “international education” or “international schools”, as this model is neither narrowly prescriptive regarding educational experience or curriculum, nor predicated on any specific educational programme. For these reasons, it might in turn be even *more suitable* as a source of definition, or at least inspiration, of such an education.

Cosmopolitanism needs not completely and immediately *replace* internationalism, but can at the very least *enrich* identity and cultural attachments in the sense of “international understanding”. It can provide a cultural depth of engagement with other cultures, loci and locals which internationalism cannot provide all by itself.

Above all, cosmopolitanism can represent a personal identity of knowledge engagement with cultural diversity for international or intercultural understanding that is at the core of international education, in terms of development (and in the form or display of continua, or otherwise) of the characteristics of a cosmopolitan person. As such, it can be used institutionally, adapted to the situational needs and resources of schools and curricula, and contribute to connecting people and places in a more harmonic understanding and integration of individual and institutional priorities.

5.3 Cosmopolitanism as Global Standard of Excellence for Socially Innovative Education

Regarding global standards of excellence for *socially innovative* education, cosmopolitanism’s transnational element can then also enrich, and even literally transform international education on several levels as well:

First, cosmopolitanism would have the individual, educational and social wingspan, as a concept and as an empirical reality, to cover approaches and philosophies from the local, over the regional and national, to the global level.

Second, this breadth and width of theory and practice is especially attractive for global metropolises like Dubai, or countries not only economically but also educationally on the rise as the United Arab Emirates. This even more if these cities aim at being leaders not just nationally, but on a regional level, as it happens to be the case with Dubai and the Middle East.

Third, cosmopolitanism represents a personal identity of knowledge engagement with cultural diversity for international or intercultural understanding that is at the core of international education, in terms of development (and in the form or display of continua, or otherwise) of the characteristics of a cosmopolitan person. As such, it can be used institutionally, adapted to the situational needs and resources of schools and curricula, and contribute to connecting people and places in a more harmonic understanding and integration of individual and institutional priorities.

Fourth, this is of even more value in the context of social innovation, since measurements of innovations in any discipline are often hard to come by, and if obtained, use to be contentious in scope and nature. Whereas the here presented model of cosmopolitanism enjoys the advantages of being theoretically robust and empirically proven, let alone a

timeless model having attracted philosophical minds and practical application through the ages. In our globalized world, this seems an attractive choice for all ages of learners and teachers, whether on an individual or institutional level.

Admittedly, its real-life application would probably require some “real application” to fulfilling its requirements and ideals, that is, to substantiate and actualize the dream of a more knowledgeable, competent individual, institution, society, nation or region, via dedicated programs of learning and improvement. Then again, the dream and the goal are probably worth the dedication and effort of walking that path.

5.4 Cosmopolitanism as a Global Standard of Excellence for Smart City Education

Regarding global standards of excellence for *smart city* education, it follows from all the above that cosmopolitanism could culminate in being a highly useful, transformative ingredient in for a global metropolis with the educational and social aspirations and agendas as Dubai:

With contemporary identities in our globalized world being more flexible and in flux than ever, it can provide an individual cultural identity form that can transcend the geographical, cultural, national or conceptual rigidities of more categorically “boxed” identity models.

Flexibly useful for both individual and institutional identity considerations, it can be adopted by, adapted for, and applied to personal backgrounds and educational levels from secondary to tertiary institutions.

Making individuals more inclined to engage interactively with local cultures on a worldwide level endows those individuals with many inestimable qualities. The term “smart” arguably might not even do those personal enrichments sufficient justice—as neither could classically narrow definitions and understandings of concepts such as “intelligence”, “knowledge” or “qualification”. Yet since “smart” has become common currency in defining and characterizing certain aspects of cities, cosmopolitanism would then be even more enriching for educational aspirations which, as shown in this paper, try to transcend those concepts’ limitations.

Having said that, our empirical research’s focus on multilingualism arguably satisfies just about everyone’s understanding of and requirements for “smartness” as well, given the increased and improved linguistic competence, together with the intercultural understanding, social competence or emotional intelligence, that are usually associated with successful language learning.

It is then particularly valuable that our research can offer educational leaders, researchers, teachers, students, institutions, just as city planners, policy makers or socially

involved entities, or indeed any private person a ready-made blueprint for embarking on a course that would benefit both them and the entire community. Since our empirical part has already tested the model’s claims in the real world, it is now up to everyone who feels to have a stake in Dubai’s smart city future, to contribute to it, to improve it, or even be welcomed to challenge it.

In conclusion, prospects and potentials for single persons or entire world cities like the ones just outlined, should make educational leaders and city planners likewise proud of their citizens’ potential, and happy with their professional and personal prospects. It is then maybe telling, fitting, and encouraging that the United Arab Emirates has been the first country in the world to have recently (2016) established official Ministries of “Happiness” and of “Tolerance”. For both, there was good precedent in terms of smart city and country considerations, since over two hundred years earlier, the United States constitutionally enshrined everyone’s right of the “pursuit of happiness”, and over two millennia earlier, the Greek Stoics endowed people with the prospect of being citizens of their own city, and at the same time of the world.

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Credit Risk Assessment Using Decision Tree and Support Vector Machine Based Data Analytics

Abhijeet Guha Roy and Siddhaling Urolagin

Abstract

Credit risk assessment has become a growing necessity in the banking sector. Data mining techniques need to be deployed, in order to enable lenders to produce an efficient and objective estimation of a customer's creditworthiness. The purpose of this paper is to propose a methodology that performs a two-level data processing using Random Forest and Support Vector Machine, to accurately pinpoint creditworthiness of the clients involved. The random forest will be utilized to create an accurate credit scoring model which will be further refined using the support vector machine. The proposed methodology will help achieve results with minimized false positives.

Keywords

Credit risk assessment • Decision trees • Random forest • Support vector machine • Data mining

1 Introduction

Tensions from the recent financial crisis and the credit crunch, have made credit risk assessment increasingly important for financial institutions to mitigate losses, maintain credit risk exposure and to secure a competitive advantage. Therefore, institutions and individuals have started working towards making credit scoring models more refined. Financial institutions use credit scoring models in order to classify loan customers as 'good applicants'—clients who have a good record of paying back the principal

amount and interests in time or 'bad applicants'—clients who might fail to payback and pose a risk to the lender [1]. Various factors such as the applicant's credit history, financial capability, loan conditions, and associated collaterals are taken into account while building such classification models. In banking databases, these factors are usually expressed in the form of attributes such as age, income, assets, current loans, credit history and employment status of the client. Abundance of data has fostered the use of data mining techniques, making credit risk assessment more efficient and accurate, thereby allowing a better estimation of a customer's credibility. It is also a fair, unbiased method of classifying the customers, improving the reliability of the credit scoring system [2].

The aim of this paper is to put forth a comprehensive scheme to carry out credit risk assessment effectively and achieving error free results with minimized false positives by combining two classification methods namely, random forest (consisting of a multitude of decision trees) and support vector machine. The paper has been organized as follows. In Sect. 2 we have given a brief overview of different classification techniques used in this research. The data set used and experiment set are presented in Sect. 3. The simulation and results are given in Sect. 4. Following it the conclusion is covered in Sect. 5.

2 Literature Review of the Techniques Used

2.1 Decision-Tree-Induction

A decision tree is a structure that gives precise sequence of decisions and consequences. Each interior node represents a test condition on an element, the outcome of the test is denoted by the edges or branches and the class label is specified by each node. The learning of decision trees from training data with class labels is known as Decision Tree Induction. Due to its good accuracy and its capability of handling data with high dimension, this technique is apt for

A. G. Roy (✉) · S. Urolagin
BITS Pilani Dubai Campus, Dubai, UAE
e-mail: f20140388@dubai.bits-pilani.ac.in

S. Urolagin
e-mail: siddhaling@dubai.bits-pilani.ac.in

the assessment of credit risk. In this paper, we utilize the C4.5 algorithm [3] proposed by Ross Quinlan. C4.5 uses a method of attribute selection called Gain Ratio. Information Gain utilized in ID3 is normalized in order to apply gain ratio [4]. Assume that node N holds the tuples of split D . The attribute having the highest information gain is used to split the node N . Gain ratio as given in (1) is defined in [5].

$$\text{GainRatio}(A) = \frac{\text{Gain}(A)}{\text{SplitInfo}_A(D)} \quad (1)$$

where,

$$\text{Gain}(A) = \text{Info}(D) - \text{Info}_A(D) \quad (2)$$

$$= \left[-\sum_{i=1}^m p_i \log_2(p_i) \right] - \left[\sum_{j=1}^v \frac{|D_j|}{|D|} \times \text{Info}(D_j) \right] \quad (3)$$

and,

$$\text{SplitInfo}_A(D) = \left[-\sum_{j=1}^v \frac{|D_j|}{|D|} \times \log_2 \left(\frac{|D_j|}{|D|} \right) \right] \quad (4)$$

$\text{Info}(D)$ is the average information required to distinguish a tuple from D . $\text{Info}_A(D)$ is the information required to classify a tuple from D based on attribute A , p_i is the probability that a tuple in D belongs to class C_i , D_j is the partition that contains those tuples in D which have result of A . $\text{Gain}(A)$ indicates the final entropy. $\text{SplitInfo}_A(D)$ is used to apply normalization to $\text{Gain}(A)$ to remove any bias. The splitting attribute in the decision tree is the attribute with the highest gain ratio.

2.2 Support Vector Machine

Support vector machine [6] is a supervised learning technique proposed by Vladimir Vapnik, used for classifying high-dimensional data. This technique uses non linear mapping to convert an original training dataset into a higher dimension. This enables the support vector machine to search for an optimal separating hyperplane which acts as an effective decision boundary, separating tuples of classes with the largest possible margin between them.

In this paper, we choose the Gaussian radial basis function (RBF) kernel [7] for the support vector machine classification since the data used is non-linear and has few attributes. This kernel can be expressed as,

$$K(x_i, x_j) = e^{\left(-\frac{\|x_i - x_j\|^2}{2\sigma^2} \right)} \quad (5)$$

where x_j is the data value used in the above kernel and x_i denotes the support vector. Here the kernel's primary aim is

to classify the training set into two parts by creating a decision boundary. The decision boundary function [8] using a radial basis function can be expressed as,

$$f(x) = \omega \cdot k(x_i, x_j) + b, \omega \in x_i, b \in \mathfrak{R}^m \quad (6)$$

where b represents a regularization parameter in m -dimensional feature space and ω denotes the normal vector to the support vector machine decision boundary.

The above decision function is an optimization problem given by,

$$\min \left(\frac{1}{2} \|\omega\|^2 + C \sum_{i=1}^n \xi_i \right) \quad (7)$$

where $\frac{1}{2} \|\omega\|^2$ signifies the margin that needs to be maximized and $C \sum_{i=1}^n \xi_i$ signifies the classification error that needs to be minimized. ξ_i are slack variables to counter inequalities in the classification problem and C is an additional regularization parameter.

2.3 Random Forests

Random forest is an ensemble technique of data mining. It returns a combination of the predictions carried out by multiple decision trees and each tree is randomly generated by a group of random vectors. In this paper, the random forest algorithm proposed by Leo Breiman is utilized. Random forests usually outperform conventional decision trees in several aspects. They avoid the problem of over fitting and handle missing values in datasets very well as opposed to the conventional decision tree models. They also enjoy better accuracy and are more efficient with larger datasets.

Random forests utilize the concept of tree bagging. Bagging (bootstrap aggregation) involves random sampling with replacement. Each decision tree is constructed on each bootstrap sample selected. Random forests also decide their decision tree split criteria by choosing a random subset of features, thereby increasing accuracy. For $b = 1$ to B , select a random bootstrap sample of size N . Build a random forest T_b by choosing a random subset of features. The output of the ensemble is represented by $\{T_b\}_1^B$.

Finally, once the decision trees are built, the predictions by all the models are combined using a majority voting approach. For $b = 1$ to B , Let $\hat{C}_b(x)$ be the class predicted by the b th random forest decision tree. Then,

$$\hat{C}_{rf}^B(x) = \text{majority vote} \{ \hat{C}_b(x) \}_1^B \quad (8)$$

When the number of trees is quite high, the generalization error of a random forest has the following upper bound,

$$\text{Generalization error} \leq \frac{\bar{\rho}(1 - s^2)}{s^2} \quad (9)$$

where $\bar{\rho}$ is the average correlation among the generated decision trees and s is the strength of the decision tree classifiers. Therefore, random forests are superior in terms of accuracy [8].

3 Data Set and Experimental Design

This Paper uses the German Credit Data Set belonging to the UCI Machine Learning Repository. It consists of 1000 instances of credit applicants [9]. Each tuple has 20 attributes associated with it namely, Status of existing financial records, Duration in month, Credit history, Purpose, Credit sum, Savings account/securities, Present work since, Installment rate in rate of discretionary cash flow, Personal status and sex, Other borrowers/underwriters, Present living arrangement since, Property, Age in years, Other portion arranges, Housing, Number of existing credits at this bank, Job, Number of individuals being obligated to give support to, Telephone and remote laborer.

4 Simulation and Results

For the purpose of this paper, R programming language along with RStudio IDE was utilized to carry out the credit risk assessment by modelling using the data mining methods discussed earlier. During the modelling process, the German Credit Data Data Set had been divided into an 80:20 ratio, 80% of the dataset allotted for training purpose and the remaining 20% of the dataset used to test the generated models. The training and test data set were randomly sampled using a sample function.

Figure 1, shows the plot of the classification type decision tree model created.

The confusion matrix with the True Positive, True Negative, False Positive and False Negative values are given in Table 1. Figure 2 depicts the ROC curve of the decision tree model constructed.

The results from Table 1 and Fig. 2 indicate that the single decision tree constructed predicts with a fair accuracy. However, to improve the accuracy, to reduce misclassification error and to avoid the over fitting problem, a random forest model has been implemented. The random forest incorporates the techniques of tree bagging, selecting random subset of features for tree splitting and majority voting, to generate the final result of the ensemble random forest.

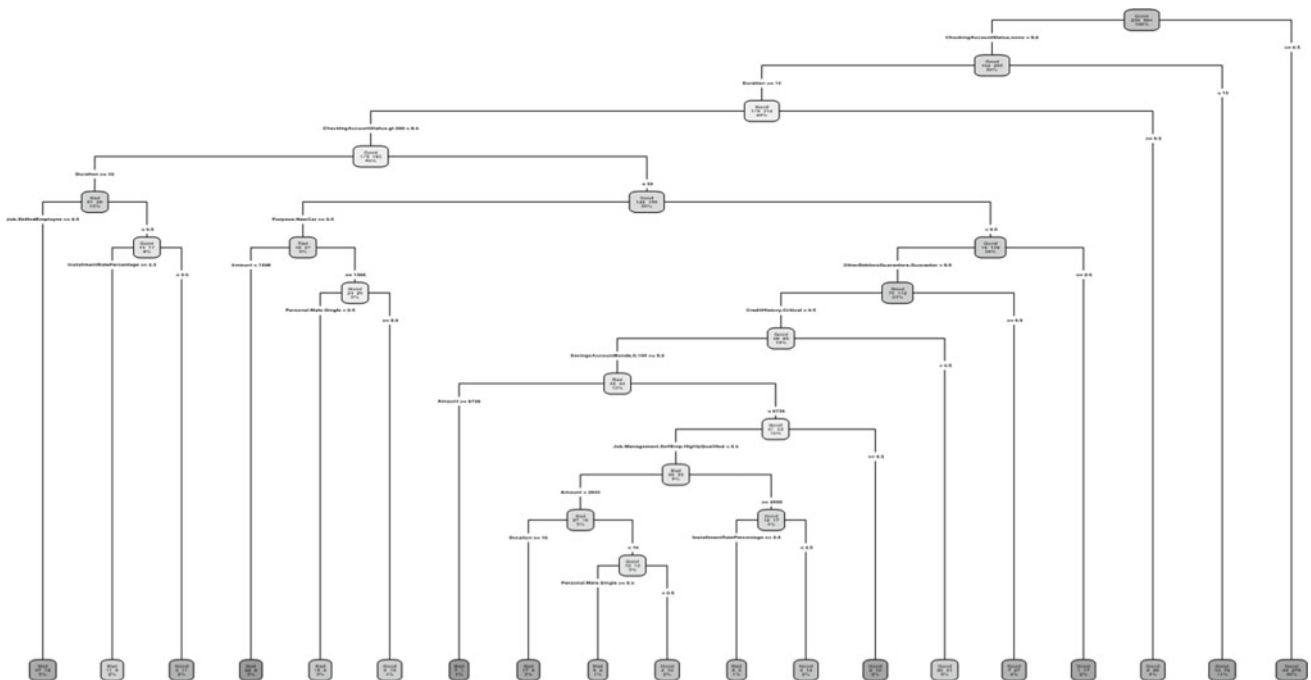
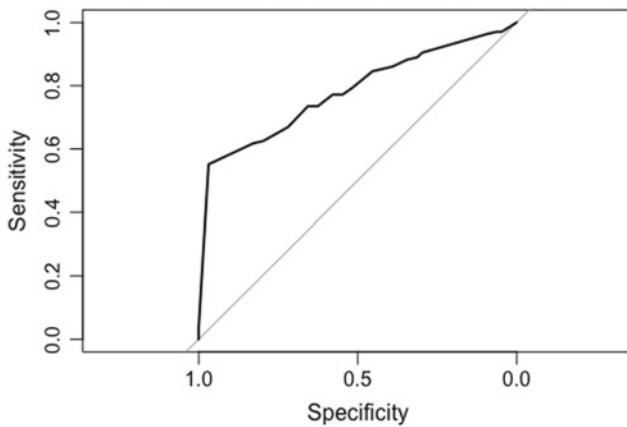
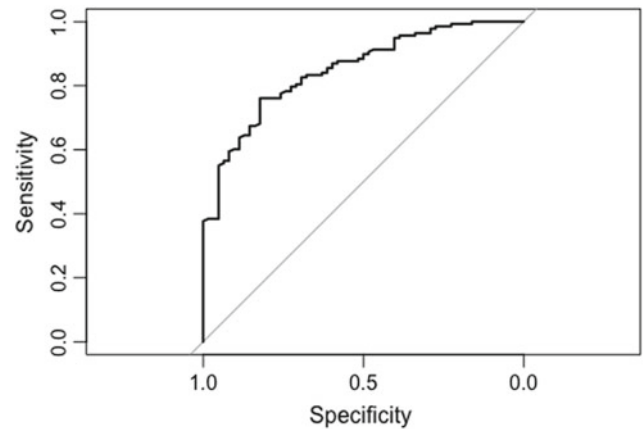


Fig. 1 Decision tree model plot constructed

Table 1 Example dataset attributes and corresponding values

Attribute	Value
Duration	6
Amount	1169
Installment rate percentage	4
Residence duration	4
Age	67
Number of existing credits	2
Foreign worker	1
Credit history paid duly	0
Credit history delay	0
Credit history critical	1

**Fig. 2** ROC curve of the decision tree model constructed**Fig. 3** ROC curve of the random forest model constructed**Table 2** Confusion matrix and statistics (decision tree)

Prediction	Reference	
	Bad	Good
Bad	29	35
Good	21	115
Accuracy	0.72	
95% C.I	(0.6523, 0.781)	

The random forest is built using a random forest function, and the number of trees is set to 1000. Table 2 and Fig. 3 show the confusion matrix and the ROC curve of the random forest model built respectively.

From Table 2 and Fig. 3, it can be inferred that the random forest enjoys a higher accuracy than the conventional decision tree model used earlier to predict credit risk. Figure 4, denotes the attributes in the German Credit Data Dataset that contributed the most during the classification in the random forest model. The attribute which contributes

more has a higher MeanDecreaseGini value, and is therefore a more important attribute for the random forest classification.

K-fold Cross validation with folds $k = 10$ has been implemented, on the random forest model, to measure its performance with more accuracy (Fig. 5).

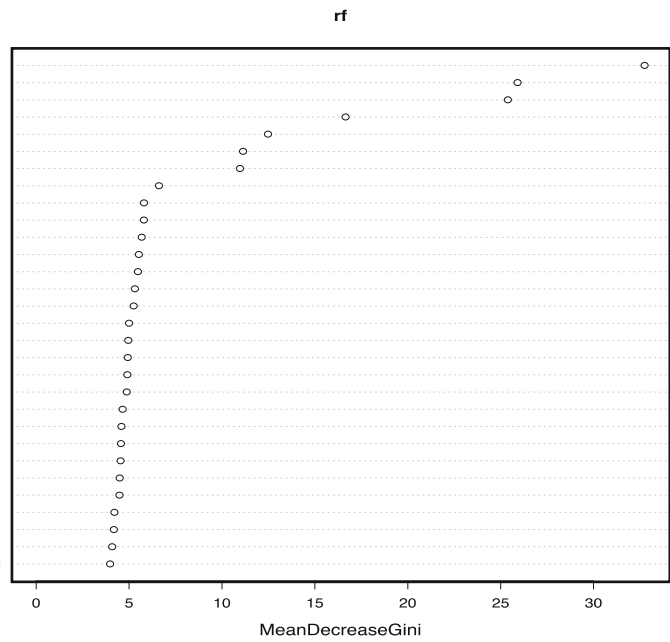
The confusion matrix and ROC curve of the cross validated random forest are given in Table 3 and Fig. 6 (Table 4).

Finally, the predicted values and real 'Class' values of the customers are compared using an anomaly table. The customers that have predicted and real 'Class' values to be different are labelled as Fraudulent = Yes and the customers that have similar predicted and real 'Class' values are labelled as Fraudulent = No. The anomaly can be classified successfully using a support vector machine with a radial Gaussian kernel (Table 5).

Predictions in which customers that are predicted as 'Good' but are actually 'Bad' are more harmful than the predictions in which customers that are predicted as 'Bad' but are actually 'Good' customers.

Fig. 4 Plot of attributes used in the random forest model with respect to MeanDecreaseGini value

Amount
 Duration
 Age
 CheckingAccountStatus.none
 CheckingAccountStatus.It.0
 ResidenceDuration
 InstallmentRatePercentage
 SavingsAccountBonds.It.100
 CreditHistory.Critical
 CheckingAccountStatus.0.to.200
 NumberExistingCredits
 Purpose.NewCar
 Personal.Female.NotSingle
 Telephone
 OtherInstallmentPlans.None
 EmploymentDuration.1.to.4
 Purpose.Radio.Television
 Property.RealEstate
 Personal.Male.Single
 Job.SkilledEmployee
 Property.CarOther
 CreditHistory.ThisBank.AllPaid
 Purpose.Furniture.Equipment
 EmploymentDuration.It.1
 CreditHistory.PaidDuly
 Property.Insurance
 Housing.Own
 EmploymentDuration.gt.7
 SavingsAccountBonds.Unknown
 Job.Management.SelfEmp.HighlyQualified



```

Random Forest

800 samples
61 predictor
2 classes: 'Bad', 'Good'

No pre-processing
Resampling: Cross-Validated (10 fold)
Summary of sample sizes: 720, 720, 721, 720, 720, 719, ...
Resampling results across tuning parameters:

mtry  Accuracy  Kappa
2     0.7249674  0.1095443
3     0.7598918  0.2851106
4     0.7511723  0.2940468
8     0.7499848  0.3162167
15    0.7599697  0.3536355

Accuracy was used to select the optimal model using the largest value.
The final value used for the model was mtry = 15.
    
```

Fig. 5 Implementing 10 fold cross validation

Table 3 Confusion matrix and statistics (random forest)

Prediction	Reference	
	Bad	Good
Bad	24	38
Good	6	132
Accuracy	0.78	
95% C.I	(0.7161, 0.8354)	

5 Conclusion

In this paper, we presented a methodology that can be utilized to effectively assess credit risk. Such practices can help banks avoid losses and provide a more objective system to

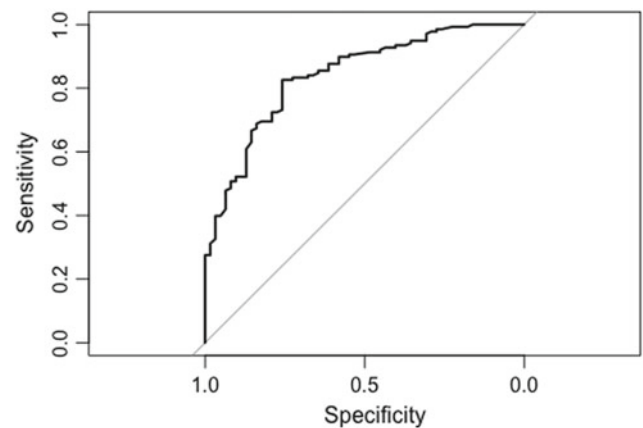


Fig. 6 ROC curve of the cross validated random forest

Table 4 Confusion matrix and statistics (cross validated random forest)

Prediction	Reference	
	Bad	Good
Bad	28	34
Good	12	126
Accuracy	0.77	
95% C.I	(0.7054, 0.8264)	

analyze the credit worthiness of its customers. The methodology used a two step process, namely a random forest and support vector machine, in order to achieve an accurate result with minimized false positives and a mechanism to detect anomalies.

Table 5 Example anomaly table

	Predicted	Real	Fraudulent
1.	Bad	Good	Yes
2.	Bad	Bad	No
3.	Bad	Good	Yes
4.	Good	Bad	Yes
5.	Good	Good	No

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Death and Factors of Adjustment Among Bereaved Parents

Mais Al-Nasa'h and Kimberly Asner-Self

Abstract

The current cross-sectional study was to examine the relationship among adjustment and other factors (spirituality, religiosity, perceived social support, and marital relationship) that might influence adjustment to bereavement among Christian, Jewish, and Muslim bereaved parents. A cross-sectional online survey was launched from January to February 2016 to measure participants' baseline adjustment, spirituality, religiosity, perceived social support, and marital relationship. A diverse group of 145 bereaved parents participated in this study, including 65 religious Christians (44.83%), 41 religious Jews (28.28%), and 39 religious Muslims (26.90%) with an average age of 44 ($SD = 12.80$). The results indicated that there were statistically significant differences between the three religious groups in terms of their adjustment, religiosity spirituality, perceived social support, and marital relationship. Muslims were found to have higher baseline rates of all study constructs more than Jewish and Christian bereaved parents. The results indicated only perceived social support and spirituality significantly predicted the adjustment level among the bereaved parents when holding all other terms constant. Whereas only perceived social support and religious involvement significantly predicted the marital relationship level among the bereaved parents when holding all other terms constant.

Keywords

Spirituality • Religiosity • Christian • Jews • Muslim • Bereaved parents

1 Introduction

Familial bereavement is recognized as a considerable life crisis [1]. Furthermore, bereaved parents are more likely to be at risk for having long lasting, and intense psychological problems such as anxiety, depression, and even suicide [2, 3]. Losing a child is a devastating experience, which dramatically changes the parents' lives [2–4]). Although much research has addressed the experiences of bereaved parents, and has come up with themes related to coping experiences, the research is still restricted to the western world, and has yet not intensely addressed the cross-cultural aspect. Although limiting this study to adherents of the three Abrahamic religions in the U.S. is still restricted in some way to the western world, in other ways it opens the door to understanding parental bereavement differences across three religions. Spirituality, religiosity, perceived social support, and marital relationship have been found to be buffers to grief; yet, it is not clear how essential these variables are to the bereaved parents across different religions.

The field of stress and coping emphasizes the need for resilience types of coping strategies for particular stressors such as bereavement [5]. Bowling said: "Loss of a loved person is one of the most intense experiences any human being can suffer" (1980, p. 7). The death of a child is considered even more severe. It is one of the more significant stressors that parents can ever have [6]. The tragic loss of a child in a family can severely disturb the parents' sense of reality and lead to a decline in their health and well-being. Research has found that bereaved parents are more likely to experience physical and emotional distress, compared to non-bereaved parents [7]. Bereaved parents showed more hostility, more recurrent psychiatric hospitalizations, and a higher ratio of developing certain types of cancers. Further research has noted that parental bereavement also adds considerable stress on the parents' marital relationship and has been correlated with high rates of divorce [6, 7].

M. Al-Nasa'h (✉)
The University of Jordan, Amman, Jordan
e-mail: m.alnasah@ju.edu.jo

K. Asner-Self
Southern Illinois University, Carbondale, IL, USA
e-mail: kasner@siu.edu

1.1 Bereavement

Bereavement is a term used to describe an objective situation that is experienced after losing a significant loved one. For most people, this is associated with emotional pain [1, 8]. The term *bereavement* has been used interchangeably with other terms such as, grief, loss, and mourning. When a death occurs to a loved one, individuals experience loss. Grief is a natural response to that loss, whereas mourning can be identified as sharing the feelings of grief [1, 9, 10]. Although much research has been done to investigate bereavement experiences among people in order to understand this objective situation; little literature has explored this phenomenon with bereaved parents among various religions.

Religions or cultures address death and afterlife in their own unique ways; understanding bereavement and the effects of losing someone significant is crucial in order to cope with that loss. Research on Christianity has been extensive [11, 12]. In contrast, few empirical studies of the Muslim and Jewish approaches toward coping with life stress event including death and grief have been done [12], and even less have been done concerning the death of a child. When considering grieving parents, how might those of religious and spiritual faith experience the loss of a child? Furthermore, how have their lives been restructured by the loss? What is their general affect after such a rupture in the family?

1.2 Death, Bereavement, Religion, Religiosity, Spirituality, and Culture

Culture emphasizes various factors; religion and spirituality are parts of them [13]. Although to some extent the meaning of death is similar among different cultures and religions, it is still quite diverse. There is agreement in terms of the biological experience, but there are many facets as to how these experiences differ from culture to culture, and from religion to religion. However, it is crucial to indicate that these differences occur within and among religious and ethnic groups. Given the fact that little related literature describes the cultural factors in death and bereavement; some researchers have called for the development a 'relevant' cultural model for dying, death, bereavement, and grief [14].

Religion is an important way through which individuals make sense of the world [5, 15]. Religious coping is used to address stressful life events [16]. A measurement developed by [17] was comprehensively created to measure a religious coping construct. It emphasizes the multiple ways that religion takes both positive and negative places in peoples' lives. According to Pargament's model, religion can promote both positive and negative coping [17, 18]. An example of positive religious coping might be the spiritual support that bereaved parents solicit from God through prayers, or through social support from

a religious community [17, 19]. Negative religious coping might be understanding the loss as God's punishment for one's own sins. Parents might have both feelings that God has abandoned them by taking their child, or that God is cruel—preying on the innocent. The loss may elicit expressions of confusion about one's relationship with God and reframe the outcomes of that loss as an act of the Devil [18, 20, 21].

A significant body of literature ties religion with bereavement. Religion, though, is more than a designation as Christian, Jewish, or Muslim in this study. The researcher looked at religiosity and spirituality as well. Malkinson and Bar-Tur [22] showed in their mixed method study, that religious beliefs were positive to grief and were helpful in increasing resilience of the bereaved parents. However, bereavement and its consequences should be represented in a sociocultural context. Some cultures have the habits and norms "of suppressing memories and exercising control of their feelings, whereas others possess entirely the opposite norms" ([23], p. 418). For example, in Israeli society, the death of a soldier is considered a communal loss and highly heroic. Memorial ceremonies and the ritual celebration of dead soldiers is a part of Israeli culture. Hence, the loss of a child who was a soldier in such a culture could become a "never ending" bereavement that would somehow be encouraged instead of discouraged [24].

Three major religions trace their genesis to a man they call Abraham or Ibrahim. They are Christianity, Judaism, and Islam. Although they have a common root, there are different customs and ways of addressing death that are prescribed in their sacred texts: the Bible, the Torah, and the Qur'an. Relevant considerations for each of these religions will be discussed below. In Islam, life is considered a journey through the physical world, and death is considered another a journey through the spiritual world. The *Qur'an* (the words of Allah and a Muslim's holy book), and the *Hadith* (the Sayings of the prophet Mohammad), are both the main resources of Muslims' religious, ethical, or spiritual beliefs, and overall life system. The *Qur'an* says "every one of us is to die, even if we hide ourselves in the world or even if we try to protect ourselves by each single means." Death is a factor of our life, and Allah will send one day the Angel of Death to take our Soul out of the flesh ([25] & Qur'an 32:11). Muslims believe that there is a quote from the *Qur'an* that is perfect after hearing the news of a death "Surely, we are from Allah, and to Him we are returning" (Qur'an, 2: 156).

1.3 Childhood Death, Grieving, and Bereavement in Islam

Islam identifies children as gifts from God. The Qur'an (25:74) describes them as the "*Joy of our eyes.*" Children are respected as individuals with inherent rights that are applied

equally to girls and boys. However, girls are considered a special joy. Prophet Mohammad urged parents to provide girls with special care, good education, proper upbringing, and recreational opportunities. Hence the role of parents in Islam is extremely respected. They are considered caretakers rather than legal guardians. They must treat their children fairly gently, and be well mannered with them [12]. As in other cultures and religions, parents wish and assume that their children will outlast them. Illness, death, and bereavement can be so devastating for Muslim parents [26, 27]. There is little literature on the experiences of Muslim bereaved parents. However, it is important to note that Muslims often address a strong reliance on Allah. For example, Muslim individual's speech usually includes *Insha-Allah* (if God wills). Studies have shown that Muslims liberally use prayer and supplication to seek natural intervention for physical and emotional illness [12].

1.4 Judaism, Death, and Bereavement

Judaism does not explicitly state that there is a life after death. "In the sweat of thy face shalt thou eat bread till thou return unto the ground, for out of it was thou taken; for dust thou art, and unto dust shalt thou return" (Genesis 3:19). Some Jews believe in an afterlife; others do not. It is not specifically stated in the Hebrew Bible (the Torah). A consolation through Hebrew writings gives ample testimony to Judaism's recognition of death as an inextricable aspect of living and human existence. The Hebrew Bible represents death as a normal and natural part of all human being's lives; all must expect it [23].

1.5 Childhood Death, Grieving, and Bereavement in Judaism

Judaism considers children who die before turning 30 days old as not having lived at all. Hence, the kin, community members, and friends are not required to mourn or provide any social support. Jewish people believe that by not mourning infants who died before they are 30 days old, the parents are freed of the burden of mourning. Moreover, attending a funeral for a child who is less than 30 days old is not compulsory compared to older children, adults, and elderly. However, many of today's Jews are not satisfied about this habit, and they are working to change that tradition [28].

1.6 Christianity, Death, and Bereavement

Christianity assures that everybody will die and return to God. "And the dust returns to the earth as it was, and the spirit returns to God who gave it" (Ecclesiastes 12:7). In the New Testament it is explicitly states that there is life after

death (John 11:25). Jesus said to Martha, Lazarus' sister: "I am the resurrection and the life. Whoever believes in me, though he die, yet shall he live". (John 11:25). In general, the New Testament assures Christians that there is an afterlife, and they will be united with God. In Luke (20:36), someone asks Jesus whom will a woman be married to in Heaven, and Jesus says that in Heaven, one only has an eternal body that neither dies nor marries. Those who are in Heaven with God and Jesus will not worry about those things anymore, because their every moment will be worship of God and worship of Jesus.

1.7 Childhood Death, Grieving, and Bereavement in Christianity

The Bible shows how Jesus sees children as valuable. It emphasizes how when they are under his care, they are valued, and will be taken care of (Matthew: 18: 2–5). The point is that the little ones are under Jesus's care, and whatever people do to them; they are really doing to Jesus. In addition, Matthew (18:10), clarifies that if Jesus has assigned an angel to the children, and that angel always sees the face of God in the Heaven, then that means to the parents who are grieving that their child is being taken care of in Heaven. "See that you do not despise one of these little ones. For I tell you that their angels in Heaven always see the face of my Father in Heaven."

1.8 Adjustment after a Child Loss

In this study, the researcher wanted to see if bereaved parents religious affiliation can predict differences across the three religious groups in religiosity, spirituality, perceived social support, and marital relationship. Post Traumatic Growth (PTG) represents using the "self-enhancing appraisals" to cope with traumatic experience- the loss of a child [29]. In the next section, religion and spirituality in relation to bereavement adjustment will be discussed. Much research has been done showing that spirituality and religiosity are pivotal in the coping process during crisis times [17, 30, 31]. However, some research has integrated religiosity and spirituality as one coping strategy with bereavement, while others identified them separately; considering that they are different terms.

1.9 Religion

A major loss can cause serious mental problems, and spiritual crisis, that could lead to alienation from the faith. People question everything about the meaning of life, and the sovereignty of God. However, there is no doubt that all bereaved people do experience, to some extent, a crisis of faith, regardless of their psychological strength, spiritual

history, or emotional maturity [32]. Research indicates that the majority of Americans are religious or spiritual [32, 33]. Hence, many bereaved people refer to their cultural background, and religious beliefs in order to accept loss, and accommodate themselves to live their lives without the deceased person. In this case, they may consider the loss as divine destiny or “God’s will”, like Muslims do, and certain Christians do [33]. Much research has tested the two types of religious coping (negative and positive), and how they interact with bereaved people [17–19, 34]. Also, religion has long offered a framework for coping with sequences of bereavement [32]. In his paper [35], the author represented the interaction between religion and adjustment to bereavement, they noted that bereaved people might find stability and comfort in their Spiritual/Religious meaning system.

1.10 Spirituality

In his paper [36], the author noted that the Soul is the core of human existence; it has an exceptional function that allows individuals to experience joy. Also, Spirituality has an enormous potential to develop during the grief. During the time of grief, bereaved people may retreated angrily from their external world, and have much access to their internal, and unconsciousness world. During grief, bereaved people’s unconscious experiences transcend their conscious, and as a result, they experience and feel their Soul. Accessing their Soul during this time enables them to reach new beliefs, emotions, and thoughts during the bereavement process [36, 37]. In his paper [38], the author indicated that spirituality has been used in grief treatment. The spiritual aspect of Humans can be source of healing. In another paper [7], the author mentioned that the spiritual element of losing a child plays a crucial role in the adjustment process for many bereaved parents. However, this has not received sufficient attention in the therapeutic literature. The spiritual dimensions of grief are profound, and rich. Some bereaved people have a very intense existential struggle during their mourning period. For example, they may question the meaning of life and death in general, and the meaning of their lives and their impending deaths in particular. However, spiritual practices during this time are common and natural. Also, bereaved people’s external and internal reactions to significant loss depend largely on their spiritual faith [33].

1.11 Religiosity/Spirituality and Adjustment with Bereavement

Much research has been done showing that spirituality and religiosity are pivotal in the coping process during stressful times [20, 30, 31]. Furthermore, research has shown that

most Americans are “fairly religious” and believe in God ([32, 39], p. 32). For example, when Americans were asked, “Do you believe in God?” 92% answered “yes”. Given the passionate views of American people regarding religiosity, such studies show that Americans who do not identify with a particular religion or do not believe in God, at least identify themselves as spiritual, or believe in an afterlife [40, 41]. Hence, it is common that people turn to religion/Spirituality in response to bereavement.

1.12 Perceived Social Support and Coping with Bereavement

Perceived social support refers to the influence that social providers have on the individual [42, 43]. Social support and perceived social support are associated in their meaning, yet perceived social support is determined by an individual’s perception about how much support he or she perceives available to him or her during a particular time [44] found an inverse relationship between both spirituality and social support with worry about one’s health among terminally ill patients. they also indicated that social support and spirituality both decreased death anxiety, but spirituality had the stronger influence. In addition, [37] indicated in the research’s results that spirituality was positively correlated with social support. A less depression levels were linked to stronger family support among bereaved individuals. Nevertheless, she noted that various types of social support were helpful at different grief stages.

Although, very little literature of empirical studies have addressed how much perceived social support is effective to bereaved parents, it is absolute in various religions and cultures to support bereaved people in general, particularly bereaved parents after a child loss. It is mentioned in the Holy Books of the three Abrahamic religions that all members of the community join in open mourning and grieving with various reactions. Sitting on the ground, weeping aloud, and sprinkling dust on the head, or tearing the clothes were all expressed in different citations in the Holy Books [33]. Islam also strongly encourages community Muslim members to attend funeral prayers, burying of the body, sitting beside the bereaved individuals, and cooking and bringing them food for at least the first three days after the loss. Islam could consider doing any of these social support activities as good deeds where Allah would reward the individual for doing them. Judaism emphasizes that bereaved people need to be comforted by kin and friends. The laws for formal mourning which known as *keriah* take over after the moment of death occurs. The *Chevra Caddish* members stay with the body, prepare for the burial, and recite prayers. Traditionally, the burial includes kin and friends who participate in mourning process and in filling the grave before leaving the cemetery [45].

1.13 Bereavement and Marital Relationship

Bereavement can be affected by many variables, including but not limited to: (a) the type of loss, (b) circumstances surrounding the loss, (c) relationship and attachment to the deceased child, and (d) cultural and personal factors. The grief that results after the child loss has been described as a unique and complex one to the parents. Hence, research should be concerned about the effect of the loss of a child, generally on the family system, and specifically on the parents within the system. It is crucial to look at how the relationship of the parents' reaction will be affected by each of their individual reactions, as well as the meaning given to the loss by each other, and which roles were lost.

Although fathers and mothers grieve in similar and different ways [6, 46] noted that losing a child is an overwhelming and intense experience that influences not only fathers or mothers, but also the family system and the parents' dyad relationship. In his paper [47], the author indicated that the crisis of losing a child could be damaging to the marital relationship. Also, it may become very serious, and lead to a divorce. However, if the marital relationship is affected negatively in some ways, it does not necessarily mean that the marriage will end in divorce. Furthermore, each parent grieves his or her own child loss differently because of the private and individual relationship that he or she had with the child who died. The different ways of coping and grieving, could threaten the marital relationship through misunderstanding or miscommunication, as well as producing a lot of tension between the couple [46].

In his paper [4], the author noted that it is challenging to work with bereaved parents to improve their relationship, because both partners have suffered a significant loss, and at least one of them could be overwhelmed and unable to provide the support that the other partner seeks for. "The realization that the partner is unavailable as a source of comfort during an intense crisis can thus adversely affect the intensity and security of the individual's attachment, and therefore the quality of the marriage" (p. 221). In such situations, the couples become a source of intense pain for each other, and stop being a source of comfort for each other. Models of adult attachment such as [4] could help people who work in the psychological field to get a better understanding of how losing a child influences parent relationships. Referring to the attachment perspective, trauma or extreme stressors can disrupt attachment bonds between parents in various ways [48]. All of this can affect return to the new normal—the bereaved parent's post-traumatic growth.

2 Methodology

2.1 Research Hypothesis

H1: There are significant relationships among base line adjustment, religiosity and spirituality, perceived social support, and marital relationship on bereaved parents' scores.

H2: There are significant differences among Muslim, Jewish, and Christian bereaved parents in terms of their base line adjustment, religiosity and spirituality, perceived social support, and marital relationship scores.

H3: As perceived social support increases, the base line adjustment and marital relationship increases among bereaved parents across religion, controlling for the effects of religiosity and spirituality.

2.2 Research Design

This descriptive field design study will help readers to understand the relationships among parental bereavement and factors that influence it among Muslim, Jewish, and Christian bereaved parents [49]. Due to time and financial limitations (via survey monkey) of conducting a larger-scale study; the researcher used a cross sectional online survey to collect data. The online survey contained a combination of several validated measures, (a) the Assessment of Spirituality and Religious Sentiment—Short version (ASPIRES-SF; [50]), (b) the Multidimensional Scale of Perceived Social Support (MSPSS; [51]), (c) the Dyadic Adjustment Scale (DAS; [52]), and (d) the Posttraumatic Growth Inventory (PTGI; [53]). These measures are usually used in bereavement and mental health research. Online surveys allow collecting data from a sample or population through a single period regardless the length of the time that will be spent to collect the data [54]. Data collection procedures started in January 2016 through the online survey without manipulating any of the study constructs.

Recent literature shows a growing interest in employing a more suitable, low cost, and rapid Internet method to recruit bereaved participants and collect data for research purposes. The Internet enables researchers to learn more about bereavement and grief from the growing online community of bereaved people [55]. Furthermore, online research methods, and particularly the survey approach, have been broadly utilized in the study of bereavement among bereaved people (e.g., [5, 35, 56–58]).

2.3 Participants

The target population included all bereaved parents with U.S. citizenship, who identified as Christian, Jewish, or Muslim. Other factors such as age, gender, marital status, level of education, time since the child's death, the cause of the death, and the number of surviving children were considered in the demographic and information questionnaire.

2.4 Procedure

Quantitative methods are considered to be more convenient for research that purposes to discover relationships between variables and predictive factors. Deploying a large sample of participants is crucial for quantitative research studies in order to attain valid results [59]. A list of the names of the bereavement foundations, children hospitals, and grief support groups with their website addresses, and the name and contact information of the person who acted as a liaison are included. After the review and approval of the Human Subject Committee (HSC), individuals were recruited via email invitations and announcements through the websites of non-profit foundations and associations of bereaved parents. Participants were notified of the study through internet-links, email list, and bereaved parents support groups. Additionally, data were collected through closed internet- support groups, where parents who have lost a child are logged in (e.g. in Facebook).

Because the researcher did not have access to individual (bereaved parents) mailing addresses, a sample of associations and non-profit foundations for bereaved parents received an email with a link to the Survey Monkey asking them to forward the research request to their membership. Also a link to the Survey Monkey was posted on some social web pages such as closed internet- support groups where bereaved parents actively participate. Participants completed an electronic cross-sectional survey (Survey Monkey) that started with giving their consent to participate in this study. They also provided some of their demographic information (background) such as their age, education, marital status, religious affiliation, age of child at death, and the number of living children.

2.5 Sample Size

In their research [49], the authors noted that it is necessary for each research study to find an adequate sample size, particularly for research that has a small population like this study. This study used an alpha of .05 and a statistical power level of .80 with medium effect size of .50. The researcher performed a G*Power analysis for each of the three research questions to find the appropriate sample size for this study that permits

giving a statistical relationship between the variables. The minimum sample size required for multiple regression analysis with four predictor variables (i.e., religiosity, spirituality, perceived social support, and marital relationship), 85 participants to achieve a power level of .80 with an alpha of 0.5. This outcome applies to represent a medium expected effect size [60]. It was hard to pre-determine how many responses the survey would get, but in general, the web survey responds rates average 30%. Unfortunately, it is impossible to determine how many people had the opportunity to take the survey, so a response rate could not be determined. In this study, a total of 145 usable surveys were utilized for data analysis. A minimum calculated sample size of $N = 126$ samples was found to be adequate for MANOVA data analysis. Having a sample size of $N = 126$ and a statistical power of .80 at a 95% confidence level with an alpha level set at .05 can be achieved for a MANOVA with five predictors (adjustment, religiosity, spirituality, perceived social support, and marital relationship) and three group criteria (Christian, Jewish, and Muslim bereaved parents).

2.6 Sampling Procedures

To select a sample from the entire population, the researcher used a method known as convenience sampling. This method is known as an accidental sampling procedure [61] and it emphasizes selecting whoever is available when researcher collects the data. In this study, researcher selected bereaved parents participants who achieved the inclusion criteria.

2.7 Instrumentation

The questionnaire for this study consisted of four measures and a demographic section. To collect data for this quantitative study, a cross sectional survey included the following instruments: the researcher developed demographic and informational survey questions; the Assessment of Spirituality and Religious Sentiment—Short version (ASPIRES-Short; [50]); the Multidimensional Scale of Perceived Social Support (MSPSS; [51]); the Dyadic Adjustment Scale (DAS; [52]); the Posttraumatic Growth Inventory (PTGI; [53]). The cross sectional survey started with a consent form.

2.8 Demographic and Information Questionnaire

The researcher developed a demographic questionnaire that was used to describe the sample. The demographic questions included participants' age, gender, ethnicity/race, nationality, religious affiliation, marital status, educational level, age of child at death, and the number of living children.

2.9 The Assessment of Spirituality and Religious Sentiment—Short Form (ASPIRES-SF)

The Assessment of Spirituality and Religious Sentiment (ASPIRES) was created to address some of the many technical problems (e.g., social desirability, ceiling effects, and bias) with previous measures that aimed to measure religious and spiritual values (e.g., [62]). However, only a few studies have assessed the validity of the scales (e.g., [63]). The (ASPIRES) purposes to measure spirituality and religiosity dimensions for various faith traditions. The Assessment of Spirituality and Religious Sentiments (ASPIRES) Scale reveals spirituality as a broad and universal source of motivation. Piedmont has repeatedly shown that spirituality adds unique variance over and above the Five Factor Model (FFM) in predicting salient psychosocial outcomes, this support the argument that spirituality may represent a sixth factor of personality [64]. Psychometric evidence supported this argument when the scale's scores continue to be reliable and structurally valid across cultures and religious contexts [65]. This scale was created to identify fundamental and motivational aspects of spirituality that emphasize all religious traditions.

Research on the ASPIRES (Cross-cultural and cross-religions) evidenced quality and generalizability of the ASPIRES scales. Psychometric support for the ASPIRES scales was provided across Christian and Jewish people (see for example, [66]). Given these research, the ASPIRES has been demonstrated to have value for understanding the religiosity and spirituality of people across different religious groups and cultures. Psychometric properties for the ASPIRES long form showed an alpha (α) coefficient for the total scores of (Spiritual Transcendence Sentiment—STS = .89), and for (religiosity involvement—RI = .89) [67]. However, research has shown that the short form is reliable, structurally valid, and possesses significant overlap with the long form [64]. Alpha (α) coefficient was found to be .76 for (STS), and .80 for the (RI). However, a correlation between the short and long form was found to be .90 for (STS) and .94 for the (RI) [64]. Despite the fact that the (ASPIRES) long form has considerably evidence of sound psychometric properties [67], the long form is not the most suitable scale for measuring spirituality in some particular settings. For example, families in crisis, hospice patients, and bereaved individuals are more susceptible to face sufficient amounts of stress, which makes it hard for them to concentrate in terms of completing lengthy tasks.

Thus, the (ASPIRES) short form (SF) was developed to figure out the unique needs presented by these populations in such circumstances [64]. In his paper [67], the author developed the Assessment of Spirituality and Religious Sentiments-Short Form (ASPIRES-SF) of 13-items as a brief

version of the longer instrument (ASPIRES). The first four items represent the Religiosity Involvement (RI) and evaluate the examinee's involvement in rituals religiousness and other related activities. On a scale from 1 (*Never*) to 7 (*Several times a week*), participants are asked to assess themselves on how frequently they: read the Torah, Koran, Bible or Geeta, read religious literature, and/or pray. Participants are also asked to rate themselves on how often they attend religious services from 1 (*Never*) to 5 (*Quite often*). The (RI) total score is computed by finding the sum value that represents the individual's religious involvement.

The remaining nine items of the scale embody the Spiritual Transcendence Scale (STS) which measures the participant's attempt to create an eclectic sense of meaning beyond the here and now. In the (STS) section, participants rate themselves from 1 (*Strongly agree*) to 5 (*Strongly disagree*). Participants who score high on these items derive meaning from a broader context such as nature or community; in contrast to participants who have a lower score they are more considerably focused and driven on the physical realities of the here and now. In their paper [50], the authors found an evidence for the predictive and construct validity of the Spiritual Transcendence Scale (STS) in an Indian sample that included Muslims, Hindus, and Christian's people. Furthermore, there is research support for the construct and predictive validity of a translated version of the Spiritual Transcendence Scale (STS) to other languages [68].

Both the religiosity involvement (RI) facet scales and the Spiritual Transcendence Scale (STS), revealed outstanding correlation with a wide array of psychosocial outcomes even after controlling for the predictive effects of personality over personality in predicting a variety of psychosocial outcomes, (e.g., *Satisfaction with Life Scale—SWLS*, *Hope Scale—HS*; [69], and *Self-Esteem Scale*) providing evidence of discriminant validity [64]. In their paper [64], the authors run a Factor Analyses of the (ASPIRES). Four eigenvalues emerged with values greater than one and the scree plot suggested that a four-factor solution was appropriate as it explained 73% of the total variance. These factors were obliquely rotated and the results show that the items from each scale represent their own factor. These findings support the putative structure of the (ASPIRES-SF).

Moreover, a multiple regression analysis utilizing the ASPIRES subscales as predictors and psychosocial outcomes as criterion variables achieved percentage of explained variance in almost each case (median $R^2 = .15$, range = .03 to .30). In their paper [64], the authors stated in their study findings that the short form was adequately reliable, whereas the use of three- and four-item scales did not compromise the internal consistency of (ASPIRES-SF). However, they assured that users can be confident about the ASPIRES short form, as it captures content similar to the

respective (ASPIRES) long form. They also showed that the ASPIRES short form avoided many of the problems that silhouetted by [70].

However, in this study, researcher will use the (ASPIRES-SF) considering the participants' emotional circumstances, the sensitivity of parental bereavement topic, and the data collection method. In this study, the researcher used the two dimensions of the ASPIRES-SF, the RI to measure the bereaved parents' religiosity involvement, and the STS to measure their spiritual transcendence sentiment.

2.10 The Multidimensional Scale of Perceived Social Support (MSPSS)

The MSPSS was created to rate individuals' perceived social support from three basic sources including family, friends, and significant others. The MSPSS has been broadly utilized to assess individuals' perceived social support across various cultures. This scale consists of 12 self-report items using a 7-point Likert scale ranging from (*very strongly disagree*) to (*very strongly agree*). Four items measure each of the three important social support sources. For example, items 6, 7, 9, and 12 measure perceived social support from friends, and Items 3, 4, 8, and 11 measure family, while items 1, 2, 5, and 10 measure significant others.

Research has shown that the MSPSS has psychometric stability, high internal and test-retest reliability, concurrent validity, construct validity and discriminant validity. The coefficient alphas of the entire instrument and its three subscales ranged from .85 to .91 indicating good internal reliability. The test-retest reliability scores fluctuated from .72 to .85 giving good stability for adult samples, over a 4-week period of study. In addition, previous studies confirmed that the MSPSS has an excellent psychometric internal reliability (coefficient α , 0.88–0.90 for the subscales and 0.86 for the entire scale). The divergent validity of the instrument was supported by negative correlations with anxiety and depression assessed by the General Health Questionnaire, whereas the concurrent validity was supported by the positive association between the MSPSS and the Lubben Social Network Scale [51, 71]. In this study, the researcher used the MSPSS to measure bereaved parent's perceived social support level.

2.11 The Dyadic Adjustment Scale (DAS)

The (DAS) was created by [52] as a tool to measure the quality of the relationship. It has been reported that the (DAS) is perhaps considered as the most broadly used scale to evaluate the relationship quality in the social and behavioral sciences [72]. The DAS consists of 32-items that

measure the dyadic adjustment. The responses of 32 items using 2, 5, 6, and 7 point Likert scale among four sub-scales. The items create a total score ranging from 0 to 151; the higher score indicates more positive dyadic adjustment. The instrument includes four subscales: 13 items of dyadic consensus that reflect the degree to which the couple agrees on matters of importance to their relationship, 10 items of dyadic satisfaction that represent the degree to which the couple is satisfied with the relationship, 5 items of dyadic cohesion that show the degree of closeness and shared activities experienced by the couple, and the final 4 items assessing degree of agreement on how affection and sexual relationship is expressed by the couple [52, 72, 73].

Studies have shown that the (DAS) is an internally consistent measure that is stable over brief intervals. Internal consistency reliability for the DAS was evaluated using Cronbach's coefficient alpha of .93 for the entire scale, and .96 for the total scale and its components, which indicates that the total scale and its components have excellent reliability to justify their use [52, 72]. In his paper [52], the author selected the Locke-Wallace Marital Adjustment Scale to assess whether the (DAS) measures the same general construct (convergent validity) as a well-accepted marital adjustment scale. A correlation of .88 and .86 was found between these scales among divorced and married respondents respectively.

Finally, the DAS has been used in several studies across culture and various populations (e.g., [74–78]). In addition, [73] found in their study of factorial invariance of the Dyadic Adjustment Scale across gender that users of the DAS should be greatly confident that it is clinically useful for both men and women. In this study, the researcher used the Dyadic adjustment scale (DAS) to measure the bereaved parents' marital relationship level.

2.12 The Posttraumatic Growth Inventory (PTGI)

The Posttraumatic Growth Inventory (PTGI) [53] is a 21-item scale that is broadly used to rate personal positive growth resulting after trauma or life crisis experiences. Individuals respond to each item of five subscales: Relating to others (seven items), New Possibilities (five items), Personal Strength (four items), Spiritual Change (two items), and Appreciation of Life (three items). Participants rate themselves on a 6-point Likert scale having options ranging from 0 (did not experience this change) to 5 (experienced this change to a very great degree). Higher scores mean greater perceived growth [79, 80].

Despite evidence that the PTGI has strong internal reliability, validity research is still limited [81]. It has been reported that the Posttraumatic Growth Inventory subscales

demonstrate moderate to strong internal consistency of α 's $> .79$ [79, 80]. Other studies have shown that the internal consistency of the PTGI is strong (alpha (α) coefficient for the total score = .90), and the test-retest reliability is .71 over 2 months [53, 82–84]. In this study, the researcher used the (PTGI) to measure the bereaved parents' adjustment level after their loss.

3 Research Findings and Data Analysis

3.1 Descriptive Statistics/Demographic Information

A total of 145 (115 females; 30 males) bereaved parents participated in this quantitative online-survey research. A total of 162 bereaved parents provided consent to participate and started the survey. Only 145 bereaved parents completed the survey, and their responses were used in the data analysis. In the U.S., Christians make up 70.6% of those who identify as religious. Only 1.9% identify as Jewish, and 0.9% as Muslim according to U.S. Bureau of Census report in 2013. For the purpose of this study, Jewish and Muslim populations were over-sampled, to assume more equivalent number of participants from each of the three religions.

In this study, participants identified their religious affiliation as the following, 65 (44.83%) identified as Christian, 41 (28.28%) Jewish, and 39 (26.90%) Muslim. The mean age of the 145 participants, with one person who did not respond was 44.15 ($SD = 12.80$) with an age range between 22 and 73 years. When the participants were divided based on their religion group, Christians were between 23 and 73,

mean age 42.34 ($SD = 12.50$), Jews were between 24 and 68, mean age 47.58 ($SD = 13.04$), and Muslims were between 22 and 67, mean age 43.67 ($SD = 12.65$) (see Table 1).

In this study, only 43.45% of respondents identified themselves as White although Whites represent 63.7% of the U.S. population. Similarly, only 7.6% of this study participants identified as Hispanic compared to the U.S. census of 16.3%. Black Americans in this study were 14.5% versus 12.2% of the total population, while Asians were 12.4 and 4.7% respectively. This is most surprising as Jews and Muslims had to be over-sampled. Although the majority of Jews are identified as White, Muslims are often identified as Arabic, Asian, or Black.

Participants were highly educated with the majority (over 70%) holding a college degree or higher. The majority of them held bachelor's degrees, 50.3% ($n = 73$). The second largest category, were those who had Master's degrees, 21.4% ($n = 31$), and 10 (6.9%) held Ph.D. degrees. Approximately 16.6% ($n = 24$) of the participants had completed High School. Only Two participants (1.4%) identified themselves having less than high school (see Table 2).

All 145 participants (100%) identified themselves as "American," or as a "U.S. citizen." However, only 113 participants (77.2%) identified being a U.S national when they were born. Thirty-two (22.1%) participants reported holding different nationalities at the time of their birth. Some of the Christian respondents came from different countries including these with majority Christian population, like Canada, England, and Jamaica. While others came from places where Christians held more of a minority status like

Table 1 Age range by religion (n = 144)

	N	%	Minimum	Maximum	Mean	Std. deviation
Age	144		22.00	73	44.15	12.79
<i>Religion</i>						
Christian	65	44.83	23	73	42.34	12.50
Jew	40	28.28	24	68	47.58	13.04
Muslim	39	26.90	22	67	43.67	12.65

Table 2 Educational level of bereaved parents participants in the study (n = 140)

Characteristics	n	%	Cumulative %
<i>Education</i>			
Less than high school	2	1.4	1.4
High school	24	16.6	18.0
Bachelor	73	50.3	68.3
Master	31	21.4	89.7
Doctorate	10	6.9	96.6
Missing	5	3.4	100.0

India, Jordan, Korea, and the Philippines. Six of the 41 Jews came from Israel ($n = 2$), New Zealand ($n = 1$), Poland ($n = 1$), Russia ($n = 1$), and Sweden ($n = 1$). Of the Muslims, 19 out of 39 came from 13 different countries, three each from Iran and Pakistan, two each from Jordan and Syria, and one each from Argentina, Egypt, the Philippines, Iraq, Kurdistan, Libya, Malaysia, and Palestine (see Table 3).

The majority of bereaved parents in this study (90.3%) reported being “married” the time of their child’s death. However, the percentage went down to (83.4%) when they indicated their current marital status. According to the data, only one person identified as divorced compare to seven at the time of this study. The status “Separated” (4.8%), and

“Re-married” (0.7%) have only been shown where participants indicated their current marital status but not when their child died. Single mom rate decreased from 4.8 to 2.8%, meanwhile the Widowed status went up from 0.7 to 1.4%. Only one person reported “living with partner” status at the time of the child’s death, and became as separated “Separated” in the current marital status (see Tables 4 and 5).

Bereaved parents reported different causes of their children’s death (see Fig. 1). Of the 145 bereaved parents, 88 (60.27%) identified the loss as natural, 39 (26.7%) as accidental, 7 (4.83%) as homicide, 5 (3.45%) as suicide, 5 (3.45%) as ambiguous circumstances, and 1 (1.29%) as other causes. The deceased children’s age ranged from 89 min to 33 years old. The average number of surviving children in

Table 3 Birth’s nationality of bereaved parents participants by religion ($n = 145$)

Religion			
Christianity		$n = (65)$	%
	American	56	88.0
	Canadian	1	1.5
	English	1	1.5
	Indian	1	1.5
	Jamaican	1	1.5
	Jordanian	1	1.5
	Korean	1	1.5
	Pilipino	1	1.5
	Unknown	2	3.0
Judaism		$n =(41)$	%
	American	35	85.4
	Israeli	2	4.9
	New Zealander	1	2.4
	Polish	1	2.4
	Russian	1	2.4
	Swedish	1	2.4
Islam		$n = (39)$	%
	American	20	51.3
	Argentine	1	2.6
	Egyptian	1	2.6
	Filipino	1	2.6
	Iranian	3	7.7
	Iraqi	1	2.6
	Jordanian	2	5.1
	Korean	1	2.6
	Kurdish	1	2.6
	Libya	1	2.6
	Malay	1	2.6
	Pakistani	3	7.7
	Palestinian	1	2.6
Syrian	2	5.1	

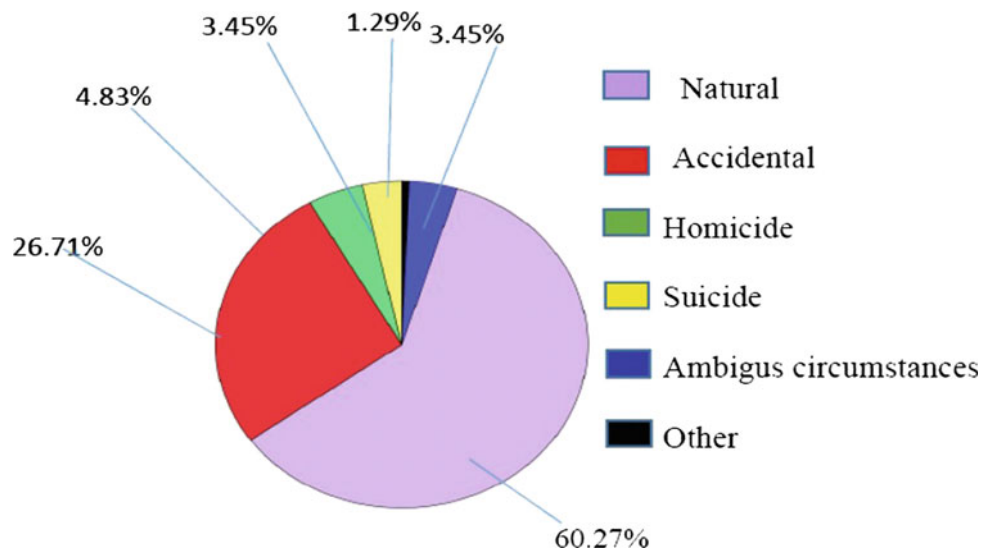
Table 4 Marital status of bereaved parent participants at time of child’s death (n = 145)

Characteristics	n	%	Cumulative n (%)
<i>Marital status at time of death</i>			
Divorced	1	0.7	1 (0.7)
Living with partner	1	0.7	2 (1.4)
Married	131	90.3	133 (91.7)
Single	4	2.8	137 (94.5)
Single mom	7	4.8	144 (99.3)
Widowed	1	0.7	145 (100)

Table 5 The current marital status of bereaved parent participants at the time of the study (n = 145)

Characteristics	n	%	Cumulative n (%)
<i>Marital status at time of death</i>			
Divorced	7	4.8	7 (4.8)
Married	121	83.4	128 (88.2)
Re-married	1	0.7	129 (88.9)
Separated	7	4.8	136 (93.7)
Single	3	2.1	139 (95.8)
Single mom	4	2.8	143 (98.6)
Widowed	2	1.4	145 (100)

Fig. 1 Causes of child’s death



the family was 1.8 (*SD* = 1.20, *Mdn* = 2.00, and *Mode* = 2.00). Parents indicated, it had been 30 days to 29 years since their loss (*M* = 7.25, *SD* = 5.64, *Mdn* = 6.00, and *Mode* = 2.00).

3.2 Inferential Statistic

Tables 6 and 7 represent a comparison of the mean scores, standard deviations, and Cronbach’s alphas on all five instruments used to measure Posttraumatic growth

(adjustment) and factors impact bereavement (Religiosity, Spirituality, perceived social support, and marital relationship) level among sample of bereaved parents in the U.S.

3.3 Hypothesis 1

H1: There are significant relationships among base line adjustment scores, religiosity, spirituality, perceived social support, and marital relationship for bereaved parents. Table 6 represents the means, standard deviations,

Table 6 Summary of Intercorrelations, means, and standard deviations for all constructs, with the dependent variable ($n = 145$)

Variable	(PTG)	(RI)	(ST)	(DAS)	(PSS)	<i>M</i>	<i>SD</i>	(α)
Posttraumatic growth (PTG)	–	.548**	.538**	.691**	.674**	70.32	19.70	.98
Religiosity involvement (RI)		–	.652**	.580**	.592**	13.7	5.84	.87
Spirituality transcendence (ST)		–	–	.458**	.550**	23.04	3.47	.55
Dyadic adjustment (DA)		–	–	–	.699**	111.61	21.74	.96
Perceived social support (PSS)		–	–	–	–	5.62	1.11	.96

** $p < 0.01$

Table 7 Means, standard deviation, and cronbach's alpha for measures of post-traumatic growth and factors impact adjustment across religion ($n = 145$)

Variable	Religion						
	Christian ($n = 65$)		Jew ($n = 41$)		Muslim ($n = 39$)		(α)
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Posttraumatic growth	57.62	20.32	77.71	8.84	83.72	13.23	
Religiosity involvement	10.60	5.35	11.87	3.15	19.66	3.78	.87
Spiritual transcendence	30.36	3.58	31.60	1.97	35.30	2.00	.55
Dyadic adjustment	99.20	20.32	117.63	11.07	125.97	12.50	.96
Perceived social support	5.08	1.17	5.70	.91	6.42	.60	.96

intercorrelations, and Cronbach's alphas of all four predictors and the one dependent construct ($n = 145$). Note that there is strong support for H1.

To answer H1, the researcher used Pearson correlation coefficients to evaluate the relationship between adjustment (PTGI) and factors impact bereavement, and found statistically significant positive relationships for adjustment (PTGI) scores and religious involvement ($r = .548, p < .001$), spiritual transcendence ($r = .538, p < .001$), dyadic adjustment ($r = .691, p < .001$), and perceived social support ($r = .674, p < .001$). All correlational analyses results showed that there were a strong positive correlation between Adjustment and both perceived social support and dyadic adjustment. A moderate positive correlation was found between adjustment and both religious involvement and spiritual transcendence.

In order to do further data analysis, the researcher assessed the data aiming at testing the assumptions that related to the multiple regressions and the MANOVA. Researcher checked the assumption for multivariate normality by analyzing the kurtosis and the skewness of each dependent variable across three religious groups. According to the analysis, the data were found to be normally distributed across all variables and religion groups that achieved the normality assumption. Then, researcher tested the data for multivariate cases with unusual patterns of scores. Using the Mahalanobis distance at $p < .05$ as a criterion helped to screen multivariate outliers or cases. Finally, researcher performed a visual inspection for the plots of the standardized residual for each case number in order to detect any outliers. Result showed that no multivariate cases were

detected, and therefore transformation of the data was not required.

Due to the fact that the distribution of the population was unequal across religious groups, e.g., the largest group (Christian, $n = 65$) was 66% greater than the smallest group (Muslim, $n = 39$); researcher checked the Pillai's Trace's test, which is considered the least sensitive at the assumption of covariance matrix, and indicates the robust of the assumption of covariance's violations. Results showed that Pillai's Trace was significant at ($p = .000$) *alpha of .001*, that emphasize that religious groups are not the same in terms of factors impact bereavement (spirituality, religiosity, perceived social support, and marital relationship).

In order to test the assumption of uncorrelated error for predictors, the researcher checked the basic bivariate correlation matrices. This assumption has to be checked prior to run any multiple regression analyses. According to the summary analysis of means, intercorrelations, and standard deviations for each predictor (see Table 9). The summary indicates that the predictor variables are highly intercorrelated. The researcher checked the Tolerance and Variance Inflation Factors (IVF) by utilizing a Collinearity statistics analysis to determine whether correlated variables predictors could cause a multicollinearity problem, which may affect any future analysis. Previous research reported that using (IVF) is a much more reliable method for compared to determining multicollinearity as a bivariate correlation matrix. In Table 9, it is clear that all VIF values were less than 5, indicating no assumption violation related to multicollinearity.

3.4 Hypothesis 2

H2: There are significant differences among Christian, Jewish, and Muslim bereaved parents in terms of their base line adjustment, religiosity, spirituality, perceived social support, and marital relationship scores. To test hypothesis two, the researcher conducted one-way MANOVA to examine the impact of religion (Christianity, Judaism, Islam) on bereaved parents' level of adjustment (Post-traumatic growth), religiosity, spirituality, perceived social support, and marital relationship (dyadic adjustment).

The MANOVA results indicated a statically significant difference among the three religious groups on the linear combinations of the five dependent measures Wilks's $\Lambda = .398$, $F(10,276) = 16.130$, $p < .001$. As a result, the null hypothesis that there are no significant differences among the three religious groups was rejected.

As a follow-up test to the MANOVA, the researcher conducted a one-way ANOVA to determine whether or not there are differences between religious groups in terms of their adjustment (PTG) and factors that may impact bereavement (see Table 7). Results indicated that the three religious groups were statically significantly different in terms of their religious involvement $F(2, 142) = 54.92$, $p = .00$, spirituality transcendence $F(2,142) = 38.00$, $p = .00$, perceived social support $F(2,142) = 22.94$, $p = .00$, dyadic adjustment $F(2,142) = 28.57$, $p = .00$, and post traumatic growth $F(2,142) = 38.71$, $p = .00$.

The values show that .35 of variability for PTG is accounted for by religion, .43 of variability for (RI) is accounted for by religion, .34 of variability for (ST) is accounted for by religion, .28 of variability for (DA) is accounted for by religion, and .24 of variability for (PSS) is accounted for by religion, (see Table 8).

A Post Hoc analysis (Tukey HSD) indicated statistically significant differences on PTG at a (.05) level by religious affiliations: (a) Christian ($M = 57.62$, $SD = 20.32$) and Muslim bereaved parents ($M = 83.72$, $SD = 13.20$) with $p = .00$; and (b) Jewish ($M = 77.71$, $SD = 8.84$) and Christian bereaved parents with $p = .00$. There was no significant difference found between Muslim and Jewish

bereaved parents' adjustment (PTG) level. Indeed, adjustment (PTG) scores indicated that Muslim and Jewish bereaved parents' scores in this study were statistically significant higher than the Christian bereaved parents (see Table 9). The results indicated a statistically significant difference in religiosity involvement between (a) Muslim ($M = 19.66$, $SD = 3.78$) and Christian bereaved parents ($M = 10.60$, $SD = 5.35$), with $p = .00$, and between (b) Jewish ($M = 11.78$, $SD = 3.15$) and Muslim bereaved parents with $p = .00$. Christian and Jewish bereaved parents were not statically significantly different in terms of their religiosity involvement at ($p = .37$).

As for the spiritual transcendence scores, results showed significant differences between (a) Muslim ($M = 35.30$, $SD = 2.00$) and Christian bereaved parents ($M = 30.36$, $SD = 3.58$), ($p = .00$), and between (b) Jewish ($M = 31.60$, $SD = 1.97$) and Muslim bereaved parents ($p = .00$). Jewish and Christian bereaved parents were not significantly different in terms of their spiritual transcendence at ($p = .74$). In terms of perceived social support, the Muslim bereaved parents' perceived social support scores ($M = 6.42$, $SD = .60$) were statistically significantly different from the Christian parents' scores ($M = 5.08$, $SD = 1.17$, $p = .00$), however no statistically significant difference was found between the Jewish parents' and Christian parents' scores (see Tables 8 and 9).

Finally, the dyadic adjustment scores indicated that there were statically significant difference among the religious groups; (a) Christian ($M = 99.20$, $SD = 24.27$) and Muslim bereaved parents ($M = 125.97$, $SD = 12.50$) ($p = .00$), and (b) Jewish ($M = 117.63$, $SD = 11.07$) and Christian bereaved parents ($p = .00$). There was no statistically significant difference between Jewish and Muslim bereaved parents' dyadic adjustment level (DA). This result suggests some similarity between Jew and Muslim bereaved parents in terms of marital relationships.

3.5 Hypothesis 3

H3: As perceived social support increases, the base line adjustment and marital relationship increase among bereaved

Table 8 Effects of religion on adjustment and factors impact PTG scores (n = 145)

Source	Dependent variable	$F(2,142)$	$\square\square$	p
Religion	Religion adjustment (PTG)	38.71	.35	.00*
	Religious involvement	54.92	.43	.00*
	Spirituality transcendence	38.00	.34	.00*
	Dyadic adjustment	28.57	.28	.00*
	Perceived social support	22.94	.24	.00*
	Error			

* $p < 0.05$

Table 9 Multiple comparisons between three religious groups

Dependent variable	(I) RELIGION	(J) RELIGION	Mean difference (I-J)	Std. error	P	99.9% confidence interval	
						Lower bound	Upper bound
RI Tukey HSD	Christian	Jew	1.1805	.88200	.376	-4.4157	2.0547
		Muslim	-9.0667*	.89577	.000	-12.3524	-5.7810
	Jew	Christian	1.1805	.88200	.376	-2.0547	4.4157
		Muslim	-7.8862*	.98921	.000	-11.5146	-4.2577
	Muslim	Christian	9.0667*	.89577	.000	5.7810	12.3524
		Jew	7.8862*	.98921	.000	4.2577	11.5146
ST Tukey HSD	Christian	Jew	-1.2405	.56290	.074	-3.3053	.8242
		Muslim	-4.9385*	.57168	.000	-7.0354	-2.8415
	Jew	Christian	1.2405	.56290	.074	-.8242	3.3053
		Muslim	-3.6979*	.63132	.000	-6.0136	-1.3823
	Muslim	Christian	4.9385*	.57168	.000	2.8415	7.0354
		Jew	3.6979*	.63132	.000	1.3823	6.0136
PTG Tukey HSD	Christian	Jew	-20.09*	3.183	.000	-31.77	-8.42
		Muslim	-26.10*	3.233	.000	-37.96	-14.24
	Jew	Christian	20.09*	3.183	.000	8.42	31.77
		Muslim	-6.01	3.570	.215	-19.11	7.09
	Muslim	Christian	26.10*	3.233	.000	14.24	37.96
		Jew	6.01	3.570	.215	-7.09	19.11
DA Tukey HSD	Christian	Jew	-18.43*	3.688	.000	-31.96	-4.91
		Muslim	-26.77*	3.746	.000	-40.51	-13.03
	Jew	Christian	18.43*	3.688	.000	4.91	31.96
		Muslim	-8.34	4.137	.112	-23.51	6.83
	Muslim	Christian	26.77*	3.746	.000	13.03	40.51
		Jew	8.34	4.137	.112	-6.83	23.51
PSS Tukey HSD	Christian	Jew	-.6115	.19492	.006	-1.3264	.1035
		Muslim	-1.3355*	.19796	.000	-2.0616	-.6093
	Jew	Christian	.6115	.19492	.006	-.1035	1.3264
		Muslim	-.7240	.21861	.003	-1.5259	.0779
	Muslim	Christian	1.3355*	.19796	.000	.6093	2.0616
		Jew	.7240	.21861	.003	-.0779	1.5259

Based on observed means the error term is mean square (error) = .955

* The mean difference is significant at the .001 level

parents across religiosity, taking into consideration the effects of religiosity and spirituality.

To test hypothesis 3, the researcher used multiple regression to determine how well perceived social support as (Independent variable), predicted the base line adjustment and marital relationship (as dependent variables) when controlling for religiosity and spirituality (as two covariates). The results showed that two predictors, perceived social support, and dyadic adjustment were statistically significant predicting adjustment (PTG) score among bereaved parents participants— $F(3,141) = 47.917, p < .001$. The adjusted R squared value was .49, suggesting 49% of the variance in

adjustment (PGT) was explained by the model. The standardized regression coefficients indicated that taking into consideration the effects of religiosity and spirituality, one-unit increase in perceived social support tends to result in .494 unit increase in adjustment (see Table 10).

To determine how well perceived social support predicted the base line marital relationship when controlling for religiosity and spirituality, the researcher used multiple regression. The results showed that perceived social support was statistically significant predicting the dyadic adjustment (DA) score among bereaved parents participants— $F(3,141) = 53.265, p < .001$. The adjusted R squared value

Table 10 Multiple regression analysis summary for religiosity, spirituality, and perceived social support, predicting adjustment (PTG) (n = 145)

Variable	B	Standardized error	β	Tolerance	VIF
Religious involvement	.479	.283	.142	.497	2.013
Spirituality transcendence	.989	.460	.174*	.534	1.873
Perceived social support	8.723	1.347	.494**	.603	1.659
Constant	-16.810	12.466			

$R^2_{adj} = .494; F(3,141) = 47.917 p < .001$

R^2 Changed = .505

* $p < .05$

** $p < .001$

Table 11 Multiple regression analysis summary for religiosity, spirituality, and perceived social support, predicting marital relationship (DA) (n = 145)

Variable	B	Standardized error	β	Tolerance	VIF
Religions involvement	.985	.304	.265*	.497	2.013
Spirituality transcendence	.109	.494	.017	.534	1.873
Perceived social support	10.746	1.447	.552**	.603	1.659
Constant	41.523	13.387			

$R^2_{adj} = .521; F(3,141) = 53.265, p < .001$

R^2 changed = .531

* $p < 05$

** $p < .001$

was .52, suggesting 52% of the variance in Dyadic adjustment (DA) was explained by the model. The standardized regression coefficients indicated that taking into consideration the effects of religiosity and spirituality, one unit increase in perceived social support tends to result in .552 unit increase in marital relationship (DA) (see Table 11).

4 Results

Results showed that religiosity, spirituality, perceived social support, and marital relationship were significantly correlated with the adjustment level (post-traumatic growth). Result also indicated that there were statically significant differences in terms of bereaved parents' level of posttraumatic growth, religiosity, spirituality, perceived social support, and marital relationship across three religious groups (Christianity, Judaism, and Islam). However, in terms of factors impacting bereavement, only two predictors, dyadic adjustments and perceived social support, significantly predicted adjustment level (PTG) among bereaved parents. What follows is further interpretation of the results based on, first the analysis findings of the demographic data, and next the study's variable discussion

4.1 Demographic Findings

Bereaved parents in this study were found to be heterogeneous in terms of their religious affiliation, age, gender,

educational level, and marital status. Although the U.S. is a diverse country in terms of religious affiliation, Christianity is the majority population. The researcher expected to observe an influx of responses from Christians first, and to have a harder time getting an equal number of Jewish and Muslim bereaved parents to respond. Surprisingly, although the majority of participants did identify as Christian, the first 27 responses identified as Jewish. The researcher did not find it surprising that it was difficult to find bereaved parents' participants identified as Muslim, who were willing to participate. Moreover, the researcher had to extend the time for data collection, and sent further invitation to liaisons at Muslim's institutions (Mosques, Islamic centers) asking their help in finding participants

The sample included far more females than males 115 (79.31%) to 30 (20.69%). This is not surprising. The majority of the grief support groups in the U.S are led by mothers of deceased children, therefore; more females responded to the survey. In addition, the literature suggests that bereaved mothers tend to talk more about their loss than bereaved fathers [85], whereas bereaved fathers prefer to cope with their loss by isolating themselves from family and friends. What is interesting though, is that 17 out of 30 males came from the Muslim group. The researcher attributes this to sampling error. When there was a lack of Muslim participants, the researcher contacted Muslim's institutions (e.g., mosques), which usually are occupied by Muslim males who come frequently to pray, limiting how many Muslim females' access to the survey.

The majority of bereaved parents in this study reported by “married” at the time of their child’s death. Given that previous studies suggests that a child’s death significantly affects parents’ relationship in negative ways [46, 47, 86], and somewhere between 5 to 23% of marriages seriously consider divorce (see for example [4]) after the loss of a child; it was not surprising to find the divorce rate in this study rise to about 4.8% which is very close to what the literature has reported. Similarly, separation rates in this study were found to be 4.8% after the event of child’s death. It is expected to find that most of the bereaved parents in this study are educated. Half of the participants identified themselves as holding a Bachelor’s degree. Only (1.4%) stopped their education prior to reaching high school.

However, it is fascinating to look at the participant’s education level across religions, and observe that most of the majority who have a Bachelor’s degree identified as Christian. Meanwhile 32 out of 41 participants who hold Masters and PhD degree were Jewish and Muslim. While a considerable amount of this discrepancy could be explained by the need to over-sample bereaved Jewish and Muslim parents, the researcher also wondered about explanations. In Judaism, there has been a long history of oppression for those who immigrated from Europe and the former ESSR. Jews were not allowed to own property and be member of many professions. Culturally, education was seen as a way out of poverty, and a way of to be accepted, needed, and protected by the Christian majority (e.g., medical field, banking, legal field).

In Islam, the history in the U.S. is more recent and likely due to immigration policy. Almost 50% of the Muslims in this study were immigrant to the U.S. Generally, accepts immigrants under special circumstances, including cases when the immigrant can do a job that a U.S citizen cannot or will not do. Examples include doctors, and other professional in inner cities, rural areas, and with refugee populations. The researcher wondered if this phenomenon refers to the fact that education level is a power that could determine socioeconomic status outcome [87]. An increase in educational level gives some privilege to those bereaved parents who are from minority religious groups in the U.S.

4.2 Post-traumatic Growth in these Bereaved Parents

On average, the bereaved parents in this study experienced a moderate level of post-traumatic growth. Considering the severity of the trauma that bereaved parent experienced (losing a child to death), it is not expected that they would report high level of growth. However, this finding endorses previous results that found a moderate post-traumatic growth levels among bereaved parents [88]. In his paper [53] the author reported that after some time of the trauma event,

adaptive mechanisms lead to a reduction in the severity of psychological suffering, then, individuals may engage in a process of conceptualizing what has happened in productive ways that make them grow. Some of bereaved parents in this study might be in that conceptualizing process of growing after their loss. That could be an explanation of their moderate PTG’s level. In addition, although existing literature supported—in general—the idea of the gender differences in coping with bereavement [89], and although males had slightly higher degree in the PTG score than females; there were no statistically statically significant differences on the PTGI’s scores between fathers and mothers in this study. These findings may be related to the fact that over 50% of the male participants are from the Muslim group, and were over sampled from mosques. Muslim men seek social support and increase their closeness to others from their religious involvement and frequent visits to the mosque.

Across religious groups, the Muslim and Jewish bereaved parents were more likely to experience post-traumatic growth than Christian bereaved parents. Although previous literature endorsed a positive relationship between religiosity and post-traumatic growth, this study is the first in comparing PTG levels across these three religious groups. However, as this study is conducted in the U.S. where Jews and Muslims represent minority religious groups in the general population, and may be both are similar in terms of being out of the U.S. mainstream, and used to being more self and other defined as cultural group with grief traditions that require familial and kinship rituals to reinforce that religious cultural group. Therefore; they may interpret PTG scores quite disparately than Christian bereaved parents who are the majority.

Moreover, Muslim’s holy books (Quran and Sunnah) both directly indicate that Allah is going to reward bereaved parents for their loss if they are patient and accept His plan for their offspring. For example, if the bereaved parent accepted Allah’s plan and was not angry at Him, coped positively with the loss, then Allah will compensate him in the current and after life. That explanation may illustrate why Muslim bereaved parents achieved higher score on PTG than the other two religious groups. There are no studies that have considered the relationship among adjustment (PTG), religiosity, spirituality, perceived social support, and marital relationship in bereaved parents across religion affiliation. In this study, bereaved parents demonstrated a significant direct relationship between adjustment (PTG) and religiosity, spirituality, perceived social support, and marital relationship.

4.3 Religiosity in these Bereaved parents

Much research shed light on how bereaved people benefit from religion in coping with grief and traumatic life events.

In his paper [11], the author indicated in their cross religion review that religious coping seems a “universal phenomenon” p.30. Even religiosity involvement is common in some ways; it is nuanced and varies among religious groups. For example, Muslims read the Qur’an to find solace [11], Jews wait for the Sabbath and consult with their Rabbis. Empirical studies suggest that religious coping could be more beneficial for particular Christian religious groups more than others. In addition, many ways of religious coping are linked with desirable outcomes (e.g., optimism, spiritual well-being, and satisfaction with life), whereas others are associated to undesirable outcomes (e.g., anxiety, and depression). In this study, Muslims reported the highest degree of religious involvement, followed by Jews, and then Christians. One explanation could be the sampling discussed earlier. Another explanation for this study result is that Muslim people pray at least five times per day, and it is very crucial for men to go for Friday prayers, funeral prayers, and religious celebration prayers. Both men and women are required to recite the Qur’an as much as they are able. That contributes to an increase in their religious involvement.

4.4 Spirituality in these Bereaved parents

The spiritual transcendence scores of Muslim bereaved parents in this study were much higher than those of Christian and Jewish bereaved parents, and no differences found between Jewish and Christian. These results are endorsed by the strong correlation between religiosity and spirituality, where Muslims represented the highest level of religious involvement and spirituality transcendence, followed by Jewish, and then Christian bereaved parent groups. These findings are consistent with previous literature where spirituality and religion are usually correlated [90, 91]. The result was not surprising to see; maybe because of Muslim beliefs in Tawhid (the oneness of God), which emphasizes spirituality in every day’s activities. Islamic creed finds spirituality in all humans’ actions in accordance with Allah’s pleasure. In short, Islam shows a unique view of spirituality as it surrounds all life aspects of a Muslims’ life. The majority of the Jews in this study were born and brought up in the U.S. The researcher did not ask whether the parent belonged to a more conservative sect that was infer more adherence to and influence from the Jewish community. Many of the Jews may have assimilated much of the U.S. traditions while remaining Jewish inane only [25]. Regardless, spiritual transcendence for everyone was moderately correlated with the marital relationship, perceived social support, and post-traumatic growth across the three religious groups.

The spirituality’s definition that was used in this study emphasizes a philosophy of life that involves ones’ meaning in life, and is concerned with the wellbeing of all. It also

represents transcendence in terms of unity consciousness—the experience of oneness with all or connection with the spiritual dimension [44]. Considering the two dimensions of the prior definition, the researcher was recommended by this research committees members’ to drop items 2, 3, and 5 of the ASPIRES scale as they do not represent spirituality, and then a measurement error would happen. The researcher contacted the ASPIRES scale author, who did not recommend dropping these three items for psychometric property and copyright matters. Hence, the researcher has run the original ST scale. To check if there would any changes to the result without the three items. The researcher has run another analyses that do not consider these three items. Interestingly, the new spiritual transcendence scores for bereaved parents were changed, the correlations between study constructs were found to be stronger except between religiosity involvement and spirituality transcendence. In addition, further differences occurred between some of the groups. For example, a statistical significant difference was found between Christians and Jews in terms of their spirituality transcendence scores, whereas it was not before excluding these three items. Further research is needed to investigate and clarify these results. Finally, as this study was conducted in the U.S., which is culturally diverse; the differences between the three religious groups could come from the idea that the spiritual aspects of grief are rich, broad, and profound based on the individuals’ cultural traditions and background. Given that most of the Muslim participants were not born in the U.S., are minorities, and underprivileged; their social norms, family heritage, emotional maturity, and personal worldview could be different in terms of utilizing spirituality in their life system [33].

4.5 Perceived Social Support in these Bereaved Parents

Again, in this study, Christians perceived social support was a lot lower than for Muslim and Jewish bereaved parents. However, most of the bereaved parents in this study perceived that they do have social support by different means. That comes from family, friends, or significant others. Results in this study also indicate that perceived social support is highly correlated with the marital relationship score, moreover, both were found to be highly correlated with the post-traumatic growth level of bereaved parents. Since, family is a major domain of the multidimensional scale of perceived social support; it is not surprisingly that bereaved parents reported consistent responses on both DA scale and MSPSS. In addition, family’s cohesion and friends’ relationships are crucial parts in the Muslim’s life system, particularly for those who identify as Arab (36% of the Muslim bereaved parents).

Usually much less boundaries are shaped with these two categories. Hence these two domains shape two thirds of the MSPSS, it may help to understand why Muslim bereaved parents have the highest level of PSS. Eventually, in the current study, a significant direct relationship was found between perceived social support and posttraumatic growth among all bereaved parents. This finding was consistent with numerous other research that found that social support is associated with increased mental health and adjustment after experiencing a life crisis or traumatic life event [92]. That endorsed the idea that when perceived social support increases, post-traumatic growth increased regardless of religious affiliation. Perceived social support was so important that it was found to be one of the predictors of post-traumatic growth among bereaved parents across three Abrahamic religious groups. The more social support bereaved parents believed they have, the more likely they were to grow after the loss experience.

4.6 Marital Relationship in these Bereaved Parents

Obviously, the marital relationship level of bereaved parents achieved the strongest association with the other two other constructs (PTG and PSS) across all variables in this study. It is fascinating that the difference was only found between Christian and non-Christian bereaved parents. Jewish and Muslim parents' marital relationships were less likely to result in post-trauma divorce. The researcher found this quite interesting and wonder if this could be tied to how parents became bereaved, how many surviving children might need an intact family, what cultural and social support might be in play. According to the data, 36% of the Christian bereaved parents experienced loss due to accidental death, suicide, and homicide reasons, which may negatively impact the marital relationship adjustment compared to the natural death causes. Empirical studies have reported association between unexpected loss and negative grief reactions [29, 93].

In addition, the number of surviving children of Christian bereaved parents was found to be the lower compared to the Jewish and the Muslim bereaved parents. This could be another factor that effects their marital adjustment. Bereaved parents' world's view may be different when they have surviving children they need to take care of after their loss. Prior studies reported when bereaved parents have another children, that not only is the divorce risk reduced, but it also shrinks the general effect of losing a child after some time, and the existing or new child becomes "a signal that the spouses are ready to move on to a new stage in their marriage" ([86], p. 84). On the other hand, duration since the loss, and age of deceased child at death was found to be not

statically significant to the bereaved parents' adjustment in this study. Finally, divorce and separation rates in this study were found to be higher among Christian bereaved parents; doubly if cultural backgrounds of religious groups could be one of the factors that manipulate these phenomena. Finally, results indicated that the higher a bereaved parent's perceived social support and achieved higher religiosity involvement level, the higher marital relationship (DA) was. This is supported throughout the marital relationship literature [94, 95].

5 Implications

This study purposed to describe adjustment and factors that impact parental bereavement across three religious groups: Christianity, Judaism, and Islam. Understanding these factors can lead to the develop and testing of effective strategies to help and support these bereaved parents in terms of their adjustment with their loss. The current study contributes to the knowledge about adjustment with bereavement, religiosity, spirituality, perceived social support, and marital relationship of bereaved parents. Moreover, it provides a basis for further study in the future.

5.1 Implications for Practitioners Working with the Bereaved Population

Because death happens both expectedly and not, and none of us is protected from losing a loved one regardless of age, gender, or religion; awareness about bereavement, its consequences and what is helpful to adjust to loss, is an important tool for practitioners to have. Certainly, the literature emphasizes the need for resilience types of coping strategies for bereavement [5]. Hence, it is important to identify what services provided for bereaved parents are perceived as helpful. Practitioners who work with bereaved parents (clinics, hospitals, counseling centers...etc.,) can benefit from the findings of this study.

Results suggest that perceived social support and spirituality significantly contributed to the posttraumatic growth of bereaved parents. On the other hand, only religiosity involvement and perceived social support contributed to the marital relationship (DA). Hence, practitioners such as nurses, doctors, counselors, psychologist, social workers, and even support group leaders may want to consider developing activities that enhance both the how bereaved parents recognize the social support they already are receiving, and how they conceptualize their spiritual life. In addition, practitioners need to consider how bereaved parents, together and separately may be using established religious and spiritual means to cope (e.g., the men going to the Mosque).

Directors and administrators who facilitate and work at counseling centers or bereavement organizations that support bereaved parents could consider cultural sensitivity and religious differences toward death. Understanding the intersectionality of religion and cultural ways of grieving a child's death could lead to more effective treatment. The findings of current study illustrate that among the three religious groups, the level of post-traumatic growth among Muslim and Jewish groups was higher than among Christians. As a result, practitioners may need to consider a group supportive approach with bereaved parents according to their religious affiliation. Hopefully this will contribute to a richer understanding of the different reactions and expressions of religiosity and spirituality in coping with bereavement, and complete integration of spiritual and religious dimensions into the parental bereavement process.

6 Limitations and Future Research

This study is a descriptive field design that has its limitations. First, Internal validity of this study was low because its constructs were measured naturally without any manipulation. Second, even though all the measures utilized in the study are generally psychometrically sound, they have not been normed on bereaved parents across the Abrahamic religions. Third, parental bereavement is a profound and sensitive experience, which may have distressed participants in ways where bereaved parents interpreted the items differently or were distracted creating possible measurement error.

Fourth, although generalizability of descriptive field research is usually relatively high [49], findings of the study were limited to bereaved parents with similar characteristics and from similar religious affiliations and geographic areas in the United States. Moreover, because of the high sensitivity of the study construct, it was difficult to obtain a random sample. Fifth, there is concern regarding social justice; results of this study were limited to those people from particular socio-economic status. For example, bereaved parents who do not benefit from grief support groups, are not members of bereavement institution, do not have internet access, do not speak English, or do not identify as belonging to one of the three Abrahamic religions were excluded.

Future research can help address some of these limitations by including some of the population that was excluded. For example, developing reliable and valid measurement through translation back-translation techniques, and using paper and pencil measurement packages in refugees' centers, health centers, and other social service centers available to bereaved parents without Internet access may result in a

larger sample size; increasing generalizability. Also, conducting research that considered ethnic minority groups such as African Americans with traditional Christian religious beliefs may give different results like achieving much more social support than white Christian European Americans.

There are large immigrant populations of Somali-Americans in Seattle and Columbus whose primary language is Somali. In Washington, D.C, there are both Christians and Muslim whose most comprehensive language is Ethiopian. Large communities of Russian Jews also exist throughout the U.S whose language is preliminary Russian. The measures used in this study could be adapted for future exploratory study within immigrants' populations. In addition, rich opportunities for qualitative research exist for study of parental bereavement among these U.S. citizens. Finally, future research may consider the type of death as a variable in order to determine how much it has impact on bereaved parents' post traumatic growth level and other factors that influence the parental bereavement.

7 Conclusion

To conclude, the current study investigated relationships among adjustment (PTG), religiosity, spirituality, perceived social support, marital relationship of Christian, Jewish, and Muslim bereaved parents. The results showed that Christian, Jewish, and Muslim bereaved parents were statistically significantly different in terms of baseline post traumatic-growth, religiosity, spirituality, perceived social support and marital relationship. The study also represents a direct relationship between adjustment (PTG) and factors impacting bereavement; however, only perceived social support and marital relationship were found to be statically significant predictors of baseline adjustment (PTG) among bereaved parents across Abrahamic religions after taking into consideration the effects of religiosity and spirituality. [2,3]

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Determinants of Entry Modes Choice for MNEs: Exploring Major Challenges and Implications for Saudi Arabia

Young-Eun Park, Alawiya Allui, and Raneem AlSelaimi

Abstract

The purpose of this paper is to examine the determinants that affect the choice of entry modes of Multinational Enterprises (MNEs) located within the Kingdom of Saudi Arabia (KSA). Its aim is to further our understanding of the features of the contexts for managing MNEs in Saudi Arabia and shed light on the different policy management approaches. This study is explorative and descriptive in nature. Secondary data are the main source of data collection. Data were obtained from reliable and authoritative sources such as SAGIA, other government agency publications, newspapers, international business journals and other related periodicals. Results from previous and current studies on similar topics were also critically reviewed. The findings of this paper will reinforce the importance of foreign direct investment as a main strategy among the policy-making bodies in Saudi Arabia in alignment with the current development goals of the Saudi Vision 2030. Although Saudi Arabia advocates the policy of economic diversity maintaining its unique structure of governance, the paper makes a case that such structure should be applied to support and achieve socio-economic growth through supporting foreign direct investment. It is original in the sense that the authors provide reasoned interpretations of Saudi Arabia's strategy on foreign market entry by the MNEs and the role that the government incentives of the international players can play in achieving balanced socio-economic growth, diversity and sustainability.

Keywords

Determinants of entry modes • Foreign Direct Investment (FDI) • Economic diversity • Multinational enterprises • Saudi Arabia vision 2030

1 Introduction

With the increasing globalization, the world is transforming into a global village. This has ushered the era of low trade barriers and global competition. In this world of expanding economies, no country can totally rely on its domestic market. Therefore, many countries, especially the developing nations have been opening up their economies to accelerate economic growth and are striving hard to mobilize funds for developing infrastructure and industry through Foreign Direct Investment (hereafter, FDI). FDI is defined as a long-term direct investment by a foreign investor in an enterprise, which is present in an economy other than that in which the foreign direct investor is based. The FDI relationship consists of a parent enterprise operating in the host country and a foreign affiliate from the home country. Multinational Enterprises (Hereafter, MNEs) are playing a key role in this foreign direct investment as bridges between economies, agents of change, and the elevation of globalization [1].

Saudi Arabia is the largest economy and the most enterprising country in the Middle East, with 38% of the total Arab GDP. It is the powerhouse of the Middle East. Based on statistics from the International Monetary Fund (IMF)'s World Economic Outlook Database, Saudi Arabia's total Gross Domestic Product amounted to \$1.720 trillion as of April 2016. Even there are political turmoil and conflicts in the Middle East, Saudi Arabia has a great value as a whole to many of the world's largest multinational enterprises, most of which enjoy a sustained profitability from their operations in this region [2]. Indeed, the list of MNEs operating in this region resembles a roster of the Fortune 500.

Y.-E. Park (✉) · A. Allui · R. AlSelaimi
Prince Sultan University, Riyadh, Saudi Arabia
e-mail: ypark@psu.edu.sa

A. Allui
e-mail: aallui@psu.edu.sa

R. AlSelaimi
e-mail: rselaimi@psu.edu.sa

In the oil sector, MNEs established a foothold in the Middle East in the 1930s when most of the region was colonized by European powers. The few independent Middle Eastern governments, such as Saudi Arabia, signed an agreement in 1932 with Western MNEs to explore oil in the Kingdom. Most MNEs in the oil and gas sectors were nationalized in the 1970s when local governments reaffirmed their sovereignty by nationalizing strategic sectors and imposed restrictions on MNEs [3]. Over the past two decades, however, in their quest to join the WTO, generate jobs, and upgrade technological capabilities [4], Middle Eastern governments including Saudi Arabia have found themselves with few alternatives but to open their doors to MNEs [5].

However, Saudi Arabia still has predominantly been an oil-based economy, with nearly 90 and 80% of fiscal and export revenue, respectively, attributed to the sales of oil, with consistent government efforts to diversify its economy to mitigate the risk associated with fluctuating crude oil prices controlled by global forces. The plunge of oil prices over the past 18 months has called that strategy into question. Thus, Saudi is now seeking foreign capital investment in a wide range of sectors. To facilitate its non-oil sector growth, the government has carried out economic reforms, so as to attract FDI across the sectors. Through its Tenth Development Plan (2015–2019) and Saudi Arabia vision 2030 (which is an achievable blueprint that expresses a country's long-term goals and expectations, strengths and capabilities), the government has aimed to achieve inclusive growth and sustainable development; thus, re-directing the economy toward its convergence path. As a result of this, more emphasis will be placed on encouraging entrepreneurship and policies to attract more FDI in knowledge-intensive industries.

Given the current situation, and recent increase in the number of MNEs and its importance in the Middle East, this study examines the determinants that affect the choice of entry modes of MNEs, especially FDI, located within the Kingdom of Saudi Arabia (KSA). In addition, several opportunities and challenges affecting MNEs in this region are discussed, including entry mode choices. Its aim is to further our understanding of the features of the contexts for managing MNEs in Saudi Arabia and shed light on the different management approaches used by MNEs in this region.

Most studies tend to focus on the FDI situation generally in Gulf Cooperation Council (hereafter, GCC) or Middle East countries. While its importance has been increased since many MNEs have emerged in Saudi Arabia, academic analyses have not sufficiently addressed its entry mode of MNEs, especially, FDI in Saudi Arabia. Based on these existing studies and our awareness of those limitations, we approach to explore the determinants of entry mode choice of MNEs in Saudi Arabia. The findings of this paper will

reinforce the importance of foreign direct investment as a strategy among the policy-making bodies in Saudi Arabia in alignment with the current development goals of the Saudi Vision 2030. Understanding the ways in which this process can be optimized is therefore a matter of central interest for scholars and practitioners within government organizations in Saudi Arabia [1]. Especially, policy makers in Saudi Arabia as a host country in which MNE subsidiaries operate find the results an important leverage for negotiating with MNEs to attract more FDI in Saudi Arabia [6].

2 Literature Review

2.1 Determinants of Choice of Entry Strategy in International Market

In [7], it is suggested that to conceptualize a firms' desired level of different mode characteristics without considering its actual entry mode used, the efficacy of mode choice models would be improved. Based on this advice, [8] believe that a diverse range of situational influences could be influenced on a firm's desire for certain characteristic of mode choice. Some factors would affect a firm to choose a desired entry mode. He took the later factors as moderating variables. Those factors were summarized in Table 1.

Different from previous conceptualization of mode choice which just depicts a series of situational influence directly affecting mode choice, [8] introduced a dynamic mode choice framework. This model considers the gap between desired model and actual one and takes alternative mode characteristics into account when a firm chooses foreign market entry mode. Driscoll's study emphasizes that there is no optimal foreign market entry modes under all conditions. Therefore, a firm cannot just consider an institutionalizing mode; it needs to consider the characteristics of modes, the firm factors, environmental factors and other factors when it

Table 1 Factors that influence entry mode choices

Situational influences	Firm factor	Firm-specific advantages
		Experience
		Strategic considerations
	Environmental factors	Demand and competitive conditions
		Political and economic conditions
		Socio-cultural conditions
Moderating variables	Government policies and regulations	
	Corporate policies	
	Firm size	

Source [8]

chooses entry mode. However, the factors that influence the entry mode choice in Driscoll's framework need to be tested by more empirical research. Meanwhile, there is a categorization for factors affecting the selection of entry mode into two types (external and internal factors). These are as follows.

As external factors, there are market size, market growth, government regulations, level of competition, physical infrastructures, level of risk (political risk, economic risk, and operational risk), production and shipping costs, lower cost of production. Market size of the market is one of the key factors an international marketer has to keep in mind when selecting an entry mode. Countries with a large market size justify the modes of entry with long-term commitment requiring higher level of investment, such as wholly owned subsidiaries or equity participation. Otherwise, most of the large, established markets, such as the US, Europe, and Japan, have more or less reached a point of saturation for consumer goods such as automobiles, consumer electronics. Therefore, the growth of markets in these countries is showing a declining trend. Therefore, from the perspective of long-term growth, firms invest more resources in markets with high growth potential.

The selection of a market entry mode is to a great extent affected by the legislative framework of the overseas market. The governments of most of the Gulf countries have made it mandatory for foreign firms to have a local partner. For example, the UAE is a lucrative market for Indian firms but most firms operate there with a local partner.

Presence of competitors and their level of involvement in an overseas market are another crucial factors in deciding on an entry mode so as to effectively respond to competitive market forces. This is one of the major reasons behind auto companies setting up their operations in India and other emerging markets so as to effectively respond to global competition. The level of development of physical infrastructure such as roads, railways, telecommunications, financial institutions, and marketing channels is a pre-condition for a company to commit more resources to an overseas market. The level of infrastructure development (both physical and institutional) has been responsible for major investments in Singapore, Dubai, and Hong Kong. As a result, these places have been developed as international marketing hubs in the Asian region.

From the point of view of entry mode selection, a firm should evaluate the political, economic and operational risk. Political instability and turmoil dissuade firms from committing more resources to a market. Economic risk may arise due to volatility of exchange rates of the target market's currency, upheavals in balance of payments situations that may affect the cost of other inputs for production, and marketing activities in foreign markets. International companies find it difficult to manage their operations in markets

where in the inflation rate is extremely high. In case the marketing system in an overseas country is similar to that of the firm's home country, the firm has a better understanding of operational problems in the foreign market in question. Markets with substantial cost of shipping as in the case of low-value high-volume goods may increase the logistics cost. It may also be one of the key factors in firms deciding to establish manufacturing operations in foreign countries.

Moreover, there are some internal factors influencing entry mode choice as follows. Companies operating in domestic markets with limited aspirations generally enter foreign markets as a result of a reactive approach to international marketing opportunities. In such cases, companies receive unsolicited orders from acquaintances, firms, and relatives based abroad, and they attempt to fulfill these export orders. Venturing into international markets needs substantial commitment of financial and human resources and therefore choice of an entry mode depends upon the financial strength of a firm. It may be observed that MNEs with good financial strength have entered international markets by way of wholly owned subsidiaries or equity participation. In view of the market potential, the willingness of the company to commit resources in a particular market also determines the entry mode choice.

Companies need to evaluate various investment alternatives for allocating scarce resources. However, the commitment of resources in a particular market also depends upon the way the company is willing to perceive and respond to competitive forces. A company well exposed to the dynamics of the international marketing environment would be at ease when making a decision regarding entering into international markets with a highly intensive mode of entry such as Joint ventures and wholly owned subsidiaries. Companies should also keep in mind exit barriers when entering international markets. A market which presently appears attractive may not necessarily continue to be so, say over the next 10 years. It could be due to changes in the political and legal structure, changes in the customer preferences, emergence of new market segments, or changes in the competitive intensity of the market.

2.2 Overview of Economy and FDI in Saudi Arabia

Saudi Arabia, the largest economy in the Middle East with 38% of the total Arab GDP, ranked third most attractive host country, ahead of Turkey and the UAE, among the other West Asian economies in terms of FDI. However, it moved from the long-held second rank, mainly due to forced norms brought about as a result of Saudization's program, which refers to the replacement of foreign staffs, expatriates with competent and skilled local employees. In addition, Saudi

Arabia has largely shielded its economy from the adverse effects of negative oil price shock on the back of enormous net foreign assets, amounting to USD 732 billion. The government has increased its spending to boost the private sector contribution to its Gross Domestic Product (GDP)

Based on Saudi Arabia's Vision 2030, which is an achievable blueprint that expresses a country's long-term goals and expectations, strengths and capabilities, Saudi government has made a plan to become a global investment powerhouse. The long-term vision of the government has helped to create a robust economy. The government has introduced initiatives to leverage upon the economic strength and geographical location, making Saudi Arabia one of the most lucrative markets for strategic investment. The government has undertaken reforms in its jurisdiction of FDI over the years, with the aim to liberalize its FDI sector. Saudi Arabia aims to at least double annual inflows of foreign direct investment over the next 10 years by focusing on new sectors such as mining, healthcare and information technology without direct links to oil export. In the past, foreign investment was heavily concentrated in the oil and gas sector, as well as downstream industries such as petrochemicals. But the plunge of oil prices over the past 18 months has called that strategy into question. Thus, Saudi is now seeking foreign capital in a wide range of sectors. To facilitate its non-oil sector growth, the government has carried out economic reforms, so as to attract FDI across the sectors. Within the non-oil sector, the private sector has performed remarkably well throughout 2010–2014.

Education, healthcare, and transport remain the focus areas of development. With the continued surge in the government spending, the non-oil sector GDP is expected to grow at 4.7% and the non-oil private sector, in particular, is expected to maintain its growth rate at 5.3% in 2015. As a result, the FDI inflow and outflow rate in Saudi Arabia, despite the economic crisis and political unrest in the neighbouring Arab economies, have been steady; thus, outlining the investors' confidence, making it the most liberal jurisdiction for FDI in the GCC countries. Encouraged by robust GDP growth, consumer confidence in Saudi Arabia is well above the MENA (referring to the Middle East and North Africa) regional average [9].

Saudi Arabia has historically built partnerships to effectively attract FDI. Ever since it became a member of World Trade Organization (WTO) in 2005, the foreign investment climate has been substantially improved. The refining and petrochemical sectors have attracted the maximum FDI. Partnership of Saudi Aramco (Saudi's largest oil company), with the world's major—ExxonMobil and Shell in its refineries and joint ventures of Saudi Arabian Basic Industries Corp. (SABIC), with Chevron, Shell, and ExxonMobil

are results of liberalized FDI. These partnerships have contributed to capital investment, transfer of knowledge, and job creation.

In 2013, the foreign companies held 48% share in the value of contracts, awarded to the 10 largest contractors in Saudi Arabia, the largest among the GCC countries. Most of these foreign companies were from Korea; thus, depicting the rise of Korea's engineering, procurement, and construction contractors since 2009. Saudi Arabia ranked 22nd in the world for the local supplier quantity and 31st for both value chain breadth and production process sophistication in the World Economic Forum 2014.

However, even these efforts, the nation has made little progress to attract more FDI than export. Exports from Saudi Arabia amounted to US\$213.4 billion in 2015, down by –40.4% since 2011 and down by –38.6% from 2014 to 2015. Saudi Arabia's top 10 exports accounted for 94.1% of the overall value of its global shipments, while exports accounted for about 12.4% of total Saudi economic output. Specially, Saudi Arabia's economy is highly dependent on oil exports (87% of total exports) and the state-owned firm, Aramco which is the world's largest oil producing and exporting company (Fig.1).

The mid-1980s was the time that foreign ownership of business was allowed. In the mid-1990s, foreign ownership rules were relaxed again, with investment sought in telecommunications, utilities, and financial services. In 2000, 100% foreign-owned businesses were allowed in the kingdom. Foreign Direct Investment in Saudi Arabia was increased by 1883 USD Million in the first quarter of 2016 and averaged 4954.86 USD Million from 2006 until 2016, reaching a high of 11,746.54 USD Million in the fourth quarter of 2010 and a record low of 1853.71 USD Million in the fourth quarter of 2014. However, compared to the external transaction through an open market such as export and import, the total percentage of internal transactions through FDI is very small (Table 2).

In recent years, FDI flows to Saudi Arabia have followed a downward trend. According to the 2015 World Investment Report published by UNCTAD, the country is now the third largest FDI recipient in Western Asia, after Turkey and the United Arab Emirates. In 2014, FDI flux declined by 9.6% compared to 2013, rising to USD 8 billion. Political and social tensions, reduced access to credit and the policy of Saudization, which started in 2011 in favour of a domestic labour force, have all been obstacles to FDI. Still, the Government has invested heavily in national infrastructure to attract investment, and FDI is seen as one of the most effective ways to diversify the economy and provide employment for younger generations. The Government recently announced the opening of the retail and wholesale sectors to 100% foreign ownership.

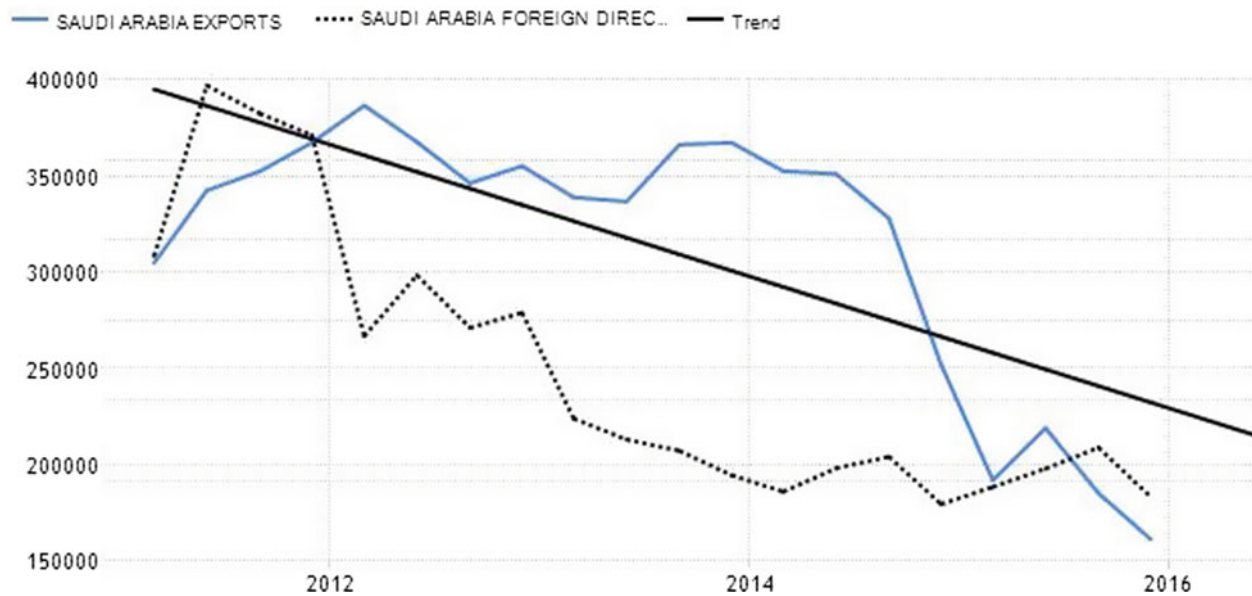


Fig. 1 Exports versus Foreign Direct Investment(FDI) in Saudi Arabia. *Source* Trading economics

Table 2 Net inflows of Foreign Direct Investment in Saudi Arabia (2006–2016) *Source* Trading economics

Saudi Arabia trade	Last	Previous	Highest	Lowest	Unit
Balance of trade	56,231.00	12,473.00	454,159.00	3898.00	Million SAR
Exports	172,633.00	138,536.00	677,144.00	9118.00	Million SAR
Imports	116,402.00	126,063.00	222,985.00	2578.00	Million SAR
Current account	-8368.00	-19,458.00	90,060.70	-27,509.30	USD million
Current account to GDP	-8.20	9.80	28.50	-21.00	Percent
Capital flows	-27,704.00	-33,639.00	102,296.29	-49,295.00	USD million
Tourism revenues	1232.00	1295.00	1295.00	633.00	USD billion
Gold reserves	322.90	322.90	322.91	142.95	Tonnes
Crude oil production	10,650.00	10,630.00	10,673.00	2340.00	BBL/D/1K
Foreign direct investment	1883.00	1899.00	11,746.54	1853.71	USD million
Tourist arrivals	15,098.00	13,380.00	17,498.00	6585.00	Thousand
Terrorism index	4.01	2.77	5.28	2.41	

The authorities welcome FDI due to its ability to transfer technology, employ and train the national workforce, foster economic development and enhance local raw materials. The country's controlled inflation and relatively stable exchange rate, openness to foreign capital in upstream gas, as well as extensive privatisation programmes are among the advantages attracting investors to the country. The dynamic performance of the banking sector is driving the growth of the non-oil sector. Lastly, access to the world's largest oil

reserves, very low energy costs and a high standard of living are decisive factors for foreign investors (Table 3).

3 Research Methodology

The present study employed a combination of exploratory and descriptive research designs. The primary purpose of the study is to examine the determinants that affect the choice of

Table 3 Foreign Direct Investment in Saudi Arabia
Source Trading economics

Foreign Direct Investment	2013	2014	2015
FDI inward flow (million USD)	8865	8012	8141
FDI stock (million USD)	207,897	215,909	224,050
Number of greenfield investments ^c	128	91	92
FDI inwards (in % of GFCF ^d)	5.0	4.2	4.9
FDI stock (in % of GDP)	27.9	28.6	34.3

^aThe UNCTAD Inward FDI performance index is based on a ratio of the country's share in global FDI inflows and its share in global GDP

^bThe UNCTAD inward FDI potential index is based on 12 economic and structural variables such as GDP, foreign trade, FDI, infrastructures, energy use, R&D, education, country risk

^cGreen field investments are a form of foreign direct investment where a parent company starts a new venture in a foreign country by constructing new operational facilities from the ground up

^dGross Fixed Capital Formation (GFCF) measures the value of additions to fixed assets purchased by business, government and households less disposals of fixed assets sold off or scrapped

entry modes of multinational enterprises located within the Kingdom of Saudi Arabia, and generate some policy recommendations based on the findings. In order to consider policy recommendations, we need to identify, in the first instance, the internal and external context factors that influence the decision of foreign investors to invest in Saudi Arabia. These contextual conditions are the outcomes of the interactions between complex forces in a country. Economic factors, social-cultural issues, institutional factors, political stability and a host of other policies all have the potential to influence the decisions of investors. As this study aims to clarify the determinants of the choice of entry modes and barriers faced by MNEs in the Saudi economy it will be descriptive in nature.

Data were obtained from reliable and authoritative sources such as Saudi Arabia General Investment Authority (SAGIA), other government agency publications, international business journals and other related periodicals. Apart from obtaining the descriptive data from authoritative sources, this study also analyzed the determinants of the factors affecting the choice of entry modes and the obstacles faced MNEs in Saudi Arabia.

SAGIA, the main government agency responsible for the investment environment in Saudi Arabia conducts surveys to enumerate various incentives provided by Saudi government bodies to Saudi and foreign businessmen and determining optimum methods and best practices of developing and marketing those incentives. The data of the survey is published in the SAGIA Annual Reports. Some of the statistical findings were relevant to this study, thus data was extracted from this source for further analysis. The statistical findings provided by this authoritative body were used to support and verify the qualitative data that had been analyzed using the literature review. The method of matching the qualitative and quantitative data enabled the study to confirm the reliability, consistency and validity of the data. As a result, it enhances the validity of the findings of the study.

4 Results and Findings

Drawing on the theories and perspectives discussed in the literature review and using [8] model on the factors that influence entry mode choice the study will discuss the situational or environmental factors and the moderating variables in Saudi Arabia. The impact on the entry decision of a number of internal and external environmental factors will be explored. These factors include both inhibiting and facilitating factors. Internal factors include company resources, and policies. Most of the experts confirmed attractiveness of the investment environment in the Kingdom in general due to several factors headed by:

The choice of variables in this study was governed by the special characteristics of the Saudi economy, in terms of its present and past history of economic, technical, and political factors, with due regard to the gap in the extant literature and other general nature of studies of this sort undertaken by others in the developed economies. The specific variables of situational influences identified in the study for the purpose of constructing the first model of determinants of choice of entry of MNEs in Saudi Arabia are the size of the Saudi market; the degree of openness of the economy; the rate of growth of per capita income; the level of local expertise and technological capability within the country; government policies and regulations and political stability. The theoretical foundations governing each of the variables used in the models are discussed below.

Market Size. The biggest situational or environmental influence among the determinants of the entry choices for the MNEs is the size of the host country market. This is relevant primarily because of its effect on the minimum efficient scale of operation where companies which are interested in exploiting the benefits of economies of scale, which will allow for the specialization of factors of production and the resultant cost minimization. According to the World Bank report in 2014, international merchandise trade exceeded 50% of the

world GDP, in the developing countries in particular, by 2013. References [10] and [11] described how the strategies of MNEs entering China could be classified into two categories: (1) market-seeking; and (2) resource-dependent. They further propose that China's huge market size is more likely to be one of the key determinants of FDI inflows into China.

Studies on the empirical estimation of the determinants of FDI, have generally found a positive relationship between FDI and market size in developing countries. Regionally, the Saudi economy is, by far, the largest of the Arab economies. The Saudi stock market (Tadawul) is by far the largest in the region—39% of total market capitalization—and one of the largest in the emerging markets. Hence in this study a positive relationship is claimed between Saudi market size and foreign direct investment. However, the experts interviewed in the SAGIA's report in 2012, mentioned the importance of provision of basic services to less developed areas in Saudi, including basic utilities and facilities of all types, water, electricity, sewage, roads, means of transport, airports, schools ... etc., so that such regions may attract investment, in addition to offering more incentives, tax exemptions, facilities specially credit facilities at soft terms, conducting feasibility studies for suggested projects and making advertisement and promotion for these projects in these underdeveloped areas.

Openness. Several studies [12, 13] have positively proven that openness promotes FDI flows, as countries that are integrated with the world economic system provide market seeking firms a larger market. Openness of an economy measures the degree to which an economy is open to foreign trade and as noted by [14: p. 132] the extent to which an economy is open to international trade has a potentially profound influence on the size of the market.

The variety of domestic and export-oriented investment opportunities in Saudi has attracted steadily increasing foreign direct investment as the economy has been progressively opened. Saudi Arabia's rapid improvements have made the country an increasingly attractive destination for investment. The World Investment Report published in 2013 measured Saudi Arabia's FDI inflows to be the 33rd largest in the world and the 3rd largest in the MENA region. Investment freedom in Saudi Arabia is by far the highest scored among the ten economic freedoms included in the Heritage Foundation's Index of Economic Freedom. According to [15], in the GCC countries, Saudi Arabia ranks (40), compared to the others which lag behind in investment freedom, UAE (123) lags behind that of Bahrain (75), Kuwait and Oman (55), and Qatar (45).

Growth of the economy. A growing economy provides opportunities for market expansion and exploitation of scale economies. This is a major consideration for the MNEs when deciding to invest in a host country. According to the World Investment Report of 2013, most governments are keen to attract and facilitate foreign investment as a means

for productive capacity-building and sustainable development [16]. Other studies have shown that level of economic development and growth of the host country as a key determinant of the entry mode choice for MNEs [17–21].

In this study, a positive relationship between FDI and growth of the Saudi economy is claimed by the expert's opinions. Saudi Arabia has pursued healthy macroeconomic policies, for example, the inflation rate has been low, by both regional and international standards, in order to stabilize the internal and external values of its currency and to develop its capital market sufficiently to serve as a catalyst for the growth and development of the economy.

The level of local expertise and technological capability. In order for a country to effectively absorb the technology from the MNEs, it has to have a minimum threshold level of technological capability. To quote [14: p. 121] once again, multinational firms will carry their advanced technology to those countries that have the infrastructure and training to use the new technology. Technological capability presupposes the availability of engineering and scientific manpower and is, thus, one of the crucial location advantages for host countries.

According to many studies, Saudi Arabia has quantitatively made enormous progress in terms of literacy, numbers of educational institutions, numbers of enrolled students and numbers of graduates. However, these achievements did not succeed increasing a qualified, motivated and committed Saudi labor force that is able to participate effectively in the development process and compete in the global market. The current expenditure on R&D at the national level, in both the public and private sectors, is most likely to capture the level of technology development in Saudi Arabia needed for the MNEs investing in the country, even though some experts mentioned a scarcity of national skilled labor.

Government Policies and Regulations. MNEs decision to invest in a host country hinges up on whichever country provides the most generous financial incentives in order to invest. That is why SAGIA was established by the Saudi government in 2000, in order to supervise, organize, and develop investments in the Saudi Arabian market; According to [22], it was set up to provide for the requirements that would permit an expanding flow of FDI into the Kingdom. The foreign Investment law issued in 2000, by the Saudi Government also provided a lot of investment incentives to investors including:

1. Guarantee of equality in benefits and incentives provided to investors.
2. 100% ownership of companies and lands by foreign investors.
3. No restrictions on capital transfer abroad.
4. Investor is to be sponsored by his project.
5. Non-availability of tax income (taxes on companies at 20% of profits).

6. Losses can be carried forward for an indefinite period.
7. The right to benefit from local and foreign financing institutions (specialized funds, programs, institutions, banks, etc.).

The Saudi Government understands the strategic importance of the MNEs in building a sustainable and diversified economy. That's why in the more recent and farther future stretching Saudi Vision 2030, the government plans to build a sustainable and diversified, high value-added economy that is well integrated into the global economy and that provides more accessible and higher value opportunities for all its citizens and residents. The sustainability of the economy is viewed as being founded on economic diversification, moving away from oil dependence, and on encouraging small businesses and entrepreneurship, and on strategically promoting foreign direct investment in the economy. 50% of investors who participated in the survey think that the incentives are actually available for all investors, 32% of investors believe that the incentives are available but there are difficulties related to them such as conditions, procedures, regulations, bureaucracy, difficulty in obtaining finance, difficulty in obtaining the required visas, and difficulties associated with obtaining lands, while 18% of investors stated that incentives are not available.

Most significantly, the experts interviewed in the SAGIA's report pointed out, the need of all economic sectors in the Kingdom to be opened for more investments because investment is the basic driver of the growth of these sectors. Experts mentioned some sectors in particular: manufacturing sector especially industries that involve high technology like automobiles, devices and equipment, pharmaceuticals and petrochemicals (with the importance of making use of King Abdulaziz University for Science and Technology as a partner for development of researches and associating them with manufacturing process), mining, oil and gas sector, information technology sector, agricultural sector especially South of the Kingdom, tourism sector, health sector, real estate sector, water sector, energy and electricity sector, transport sector, educational sector especially quality and technical education, and service sector supporting other sectors. Majority of experts also mentioned availability of several incentives provided by various governments and private agencies in the Kingdom, but they pointed out lack of coordination among relevant authorities, bureaucracy of some government bodies and lack of advertisement and effective promotion; and unavailability of a central body for planning, drawing and periodically revising the investment policy commensurate with development plans.

Political Stability. Political stability is determined by the stability of national governments, on the one hand, and the stability of the actions of the government that have an effect on business, on the other. Political instability may, therefore,

be said to exist when there are sudden and frequent changes both in government and in the policies of the government.

Investors consider continuity in policies as one of the important considerations in their decision to invest abroad. In the case of Saudi Arabia, political stability has been characterized by relative policy stability but relatively stable political environment. Based on the respondent's views political and economic stability in the Kingdom has been one of the strong determinants of them choosing to invest in the country. The experts pointed out the need of all economic sectors in the Kingdom for more investments because investment is the basic driver of the growth of these sectors. This finding is interesting because it parallels what previous studies found for foreign investment practices of MNEs in the US. Another study which augments this perspective is the one done by [20], which classify the determinants of foreign direct investment, as the political factors, and a variety of economic factors, such as investment incentives, the size and growth of the recipient's market, its degree of economic development (e.g. infrastructure), market distance, and economic stability in terms of inflation, growth and balance of payments.

5 Conclusions

With the objective of providing a complement to the existing literature, which has mainly shed light on developed markets, this study investigated the determinants of the entry mode choice in emerging economies in the Middle East context, especially Saudi Arabia. After conducting analytic review, this study provides three observations and contributes to the body of knowledge of foreign direct investment and multinational enterprises literature in three ways. First, researches on MNEs entry modes in emerging countries tend to be limited in literature—most are concentrated on the developed countries; thus this study should extend the understanding of the foreign direct investment process among the MNEs. Second, this study focused on the situational context and impediments facing MNEs in their implementation strategies which represent the practicality of the phenomenon, thus bridging the gap between theories and realities. Third, this study brings to light the significance of the government incentives in foreign investment process for the MNEs in these economies.

Despite the challenges they encountered, the MNEs in Saudi Arabia still obtained benefits from various policies, programs and incentives provided by the government. This study acknowledged the significance of MNEs foreign direct investment for economic growth in the emerging countries; therefore, their success is an advantage to these countries' economic development and sustainability. This reveals that government involvement has contributed significantly to the growth of the MNEs involvement and investment in the

country. MNEs in Saudi need to evaluate their strategies before embarking into new geographic locations and engaging in contractual investment decisions. As a recommendation, government agencies should assess their key role and differentiate themselves from one another to avoid redundancies among them. This would help to resolve many impediments related to the bureaucracies and their overlapping, as well as conflicting procedures.

Even though our findings were significant and valuable, this study has some limitations. Such limitations and the future direction of the research are as follows. It is clear that while there exists some knowledge as to how companies have entered and expanded abroad, very little is known about the entry of MNEs to the Middle East in general. The MNE's in emerging countries literature suffers from acute paucity. The very few studies that were undertaken in this area made little or no contribution to our understanding of how firms enter into these markets, because they limited their focus to one single industry or studied just one aspect of entry (e.g., franchising or investment entry). Not one study provided generalizable insights into the foreign market entry behaviour of firms in these contexts. Therefore, literature analysis conducted on the determinants of the entry choices and the barriers of MNEs in their entry mode process might be inadequate as it is limited to the availability of the current and previous studies. Another problem is the multiplicity of agencies involved in the collection and processing of data. Each of these agencies collects and processes the data according to its charter of duties and responsibilities. This affects the consistency of data. Additionally, a problem faced in the study of FDI in Saudi Arabia is the non-availability of consistent and dependable data on FDI flows. Quantitative data obtained from the secondary source were not raw data, thus statistical testing could not be further conducted and analyzed. Finally, there are a great number of factors that influence the choices and volume of FDI flows and in a study of the determinants we consider only a few of them both due to considerations of data availability. But it must be conceded that it is not possible to include all of the factors, even if we are able to identify all of them. In spite of these limitations this study will provide some insight into the relationship between domestic economic, socio-cultural and political contexts and MNEs and lead to a greater understanding of the way they interact.

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Developing an Input Oriented Data Envelopment Analysis Model with Fuzzy Uncertainty in Variables

Assem Tharwat¹, Basma El-Demerdash², and Ihab El-Khodary³

Abstract

Data Envelopment Analysis (DEA) technique is considered one of the most appropriate tool for assessing performance through calculating the technical efficiencies of a collection of related comparable organizations in transforming inputs into outputs. The conventional DEA methods require accurate measurement of both the inputs and outputs. However, the observed values of the input and output data in real-world problems are sometimes imprecise or vague, i.e. fuzzy. Imprecise evaluations may be the result of unquantifiable, incomplete and non-obtainable information. From the literature of fuzzy DEA applications, most if not all developed models considered all input and output variables as fuzzy, through adopting either the traditional DEA model or the output version of the model, and solved using the α -level approach. Accordingly, the main aim of this paper is to develop a Fuzzy Input Oriented DEA Model that considers a mix of both fuzzy and deterministic output and/or input variables to be solved using the α -cut approach. The developed model algorithm is divided into three stages; it starts by defining the membership function for the fuzzy variables (assumed triangular), then finding the α -cuts for the fuzzy variables, and finally calculating the relative efficiency for each decision making unit (DMU). The model is demonstrated through an illustrative example.

Keywords

Data envelopment analysis • Fuzzy variables • Performance measure • Efficiency analysis

1 Introduction

The efficiency concepts are used for evaluating the effect of regulations and if they play an important role. The basic definition of efficiency refers to the ability of an organization to produce the maximum output levels with a set of input levels [1]. The value of DEA developed by Charnes et al. [2], lies in its capability to relatively assess the individual efficiency or performance of a decision making unit (DMU) within a target group of interest that operates in a certain application domain such as education, banking, healthcare, agriculture, transportation, etc. All these applications practically adopt DEA for a variety of reasons, as Golany and Roll [3] pointed out that it can be applied to identify sources of inefficiency, rank the DMUs, evaluate management, evaluate the effectiveness of programs or policies, create a quantitative basis for reallocating resources, etc. Some 30 years after the publication of the influential paper by Charnes et al. [2], the application domain for DEA has grown to such an extent that almost no one in the DEA research community is able to keep track of its development and in particular on how widely DEA is applied to real world applications.

DEA method has several advantages, one of these is that it does not require either a priori weights or a clear specific relationships between the multiple input variables and the multiple output variables. However, one of the most important weaknesses in traditional DEA models is that it does not allow vague variation in the multiple input and multiple output variables, although many important reality problems could be fuzzy in nature. As a result, the efficiency measurement via DEA model could be sensitive to the different variations in variables. An efficient DMU which is

A. Tharwat
College of Business Administration, American University in the Emirates, Dubai, UAE
e-mail: assem.tharwat@aue.ae

B. El-Demerdash (✉) · I. El-Khodary
Department of Operations Research and Decision Support, Faculty of Computers and Information, Cairo University, Giza, Egypt
e-mail: basma.ezzat@fci-cu.edu.eg

I. El-Khodary
e-mail: e.elkhodary@fci-cu.edu.eg

relative efficient to other comparable DMU could turn to be an inefficient DMU if such vague variation is considered in variables either inputs or outputs or both, or vice versa. In another word, if the collected data for a variable are not represented in the correct form, then the resulting efficiencies will be erroneous and misleading because of the high sensitivity of the efficiency scores to the realized levels of inputs or outputs.

In the recent years, there are good efforts that have been made in the DEA models to handle the vagueness in variables either fuzzy input or fuzzy output. The applications of fuzzy DEA model are usually categorized into four groups as tolerance approach, α -cut approach, fuzzy ranking approach, and possibility approach. The α -cut approach is considered the most popular fuzzy DEA model. Sengupta [4] was the first express to the fuzziness in the objective function and constraints and developed a fuzzy mathematical programming model using the tolerance approach. The α -cut approach was proposed by Girod [5], the main idea of the α -cut approach is to convert the fuzzy DEA model to find the lower and upper bounds of the membership functions of the efficiency scores through a pair of parametric programs. Triantis and Girod [6] kept track of the beginning of fuzzy DEA model to measure technical efficiency by converting fuzzy input and fuzzy output variables into crisp variables using membership function. Kao and Liu [7] proposed a method to find the membership functions of fuzzy variables when data are fuzzy to measure relative efficiency using the fuzzy DEA model based on the α -cuts principle to convert a fuzzy DEA model to a family of crisp DEA models. Kao [8] proposed a DEA method for ranking the fuzzy relative efficiency scores where all input and output variables are fuzzy in nature. Saati et al. [9] proposed a fuzzy DEA model as a possibilistic programming problem and converted it into an interval programming problem using α -cut approach. Entani et al. [10] developed a DEA approach for fuzzy input and output data by using α -level sets with an interval efficiency consisting of the efficiencies. Kao and Liu [11] developed a method to rank the fuzzy relative efficiency scores when all variables have fuzzy nature, which means the exact form of the membership functions are unknown.

Liu et al. [12] developed a modified fuzzy DEA model using an α -cut approach to handle fuzzy in input and output variables and incomplete information on weight indices in product design evaluation. Liu [13] proposed a fuzzy DEA model using an α -cut approach to find the relative efficiency scores when all variables were fuzzy numbers. Zerafat et al. [14] developed fuzzy DEA model based on an α -cut approach to retain fuzziness of the model by maximizing the membership functions of inputs and outputs. Khoshfetrat

and Daneshvar [15] proposed a modified fuzzy DEA model using the α -cut method, to convert the given fuzzy data to interval numbers, then computed lower bounds of fuzzy inputs and outputs for each factor weight. Azadeh et al. [16] proposed a flexible approach composed of artificial neural network and fuzzy DEA for location optimization of solar plants. Zerafat et al. [17] introduced a DEA fuzzy model that can include some uncertainty information from the intervals within the α -cut approach.

From surveying the literature we reached two main conclusions. The first is that the available fuzzy DEA models consider all output and/or input variables as fuzzy in nature, although some might have a deterministic in nature. The second is that the DEA models adopted are either the traditional DEA model or the output oriented DEA model, but none (to our knowledge) considered input oriented DEA models. Accordingly, in this study, we attempted to develop a Fuzzy input oriented DEA that considers a mix of fuzzy and deterministic input and/or output variables.

The rest of the paper is organized as follows. The coming section discusses the methodology of the traditional DEA model. The third section includes the proposed fuzzy input oriented DEA model. This is followed by a hypothetical illustrative example. The paper will end with the customary conclusions and implications for the future.

2 Data Envelopment Analysis General Mathematical Model

The basic DEA model for ' n ' DMUs with ' J ' inputs and ' S ' outputs were first proposed by Charnes, et al [2]. The model determines the relative efficiency score for the different DMUs. The model depends on maximizing a production function estimated by DEA. This function is a deterministic frontier. For any inputs, the value of the DEA estimate defines the maximum output producible from inputs under all circumstances. On the other hand, for any outputs, the value of the DEA estimate defines the minimum input producing a given output under all circumstances. In this sense, it is comparable to the parametric frontier with one-sided deviations estimated using mathematical programming methods.

According to the assumptions relating the change in outputs as a result of the change in inputs, the DEA model can be classified as having either constant returns to scale (CRS) or variable returns to scale (VRS). Under CRS models the outputs are not affected by the size of the DMU, rather they change in direct proportion to the change in inputs assuming that the scale of operation does not

influence efficiency; therefore, in the CRS models the output and input oriented measures of efficiency are equal. Under VRS models, changes in outputs are not necessarily proportional to the changes in the inputs; therefore the output and input oriented measures of efficiency scores are not equal for inefficient units [18]. In this paper we are focusing on the input oriented VRS model, which is as follows:

$$\begin{aligned}
 & \text{Min } Z_p = \theta \\
 & \text{s.t.} \\
 & \sum_{i=1}^n \lambda_i x_{ij} \leq \theta x_{pj}, \quad \forall j = 1, \dots, J \\
 & \sum_{i=1}^n \lambda_i y_{is} \geq y_{ps}, \quad \forall s = 1, \dots, S \\
 & \sum_{i=1}^n \lambda_i = 1 \\
 & \lambda_i \geq 0, \quad \forall i = 1, \dots, n
 \end{aligned} \tag{1}$$

where θ = efficiency score of DMU p ; $s = 1$ to S (no. of outputs); $j = 1$ to J (no. of inputs); $i = 1$ to n (no. of DMUs); y_{is} = amount of output s produced by DMU i ; x_{ij} = amount of input j utilized by DMU i ; and λ_i = weight given to DMU i .

3 Developed Fuzzy Input Oriented DEA Model

Since we are interested in evaluating the performance of comparable organizations in order to assure the quality given that some of the input and/or output variables might be fuzzy in nature, it was necessary to develop a fuzzy input oriented model. Therefore, in this section we present our modification to the traditional DEA model in order to measure relative efficiency in the presence of fuzzy variation in some of the inputs and/or outputs. Our developed Fuzzy Input Oriented DEA (FIODEA) model is based on the α -cuts approach. The restriction involving some of the input and/or output quantities in the DEA model will be a fuzzy inequality that may at times be violated. Because an inequality involving a number of fuzzy variables can never be imposed with crisp, the strategy in α -cuts is to ensure that the probability that the inequality holds for a fuzzy sample of these variables and that it does not fall below a certain level. Our model consists of three stages. The first stage requires defining the membership function for the fuzzy input and output variables. The second stage involves specifying the α -cuts for the fuzzy inputs and outputs. In the third stage, the relative efficiency scores are calculated for each DMU.

The α -cuts input oriented model for measuring the efficiency level of DMU p is as follow:

$$\begin{aligned}
 & \text{Min } \tilde{Z}_p = \theta \\
 & \text{s.t.} \\
 & \sum_{i=1}^n \lambda_i x_{ij} \leq \theta x_{pj}, \quad \forall j \in J_D \\
 & \sum_{i=1}^n \lambda_i \tilde{x}_{ij} \leq \theta \tilde{x}_{pj}, \quad \forall j \in J_F \\
 & \sum_{i=1}^n \lambda_i y_{is} \geq y_{ps}, \quad \forall s \in S_D \\
 & \sum_{i=1}^n \lambda_i \tilde{y}_{is} \geq \tilde{y}_{ps}, \quad \forall s \in S_F \\
 & \sum_{i=1}^n \lambda_i = 1 \\
 & \lambda_i \geq 0, (i = 1, 2, \dots, n)
 \end{aligned} \tag{2}$$

where J_D is the set of deterministic inputs, J_F is the set of fuzzy inputs, J is the set of all inputs, where $J_D \cup J_F = J$ and S_D is the set of deterministic outputs, S_F is the set of fuzzy outputs, and S set of all outputs, where $S_D \cup S_F = S$.

By comparing model (2) to model (1), it is evident that the two constraints handling the inputs and outputs each is divided to two constraints in order to handle the deterministic variables independently from the fuzzy variables.

In the proposed model, we are assuming that the membership functions for the fuzzy variables are triangular. Accordingly, the amounts of the fuzzy inputs (\tilde{x}_{ij}) or outputs (\tilde{y}_{is}) could be expressed as follows:

$$\mu_{\tilde{x}_{ij}} = \begin{cases} 0, & x_{ij} \leq x_{ij}^L \\ \frac{x_{ij} - x_{ij}^L}{x_{ij}^M - x_{ij}^L}, & x_{ij}^L \leq x_{ij} \leq x_{ij}^M \\ \frac{x_{ij}^U - x_{ij}}{x_{ij}^U - x_{ij}^M}, & x_{ij}^M \leq x_{ij} \leq x_{ij}^U \\ 0, & x_{ij} \geq x_{ij}^U \end{cases} \tag{3}$$

$$\tilde{x}_{ij} = (x_{ij}^L, x_{ij}^M, x_{ij}^U), \quad 0 \leq x_{ij}^L \leq x_{ij}^M \leq x_{ij}^U \rightarrow \tilde{x}_{ij} \in [x_{ij}^L, x_{ij}^U] \tag{4}$$

$$\mu_{\tilde{y}_{is}} = \begin{cases} 0, & y_{is} \leq y_{is}^L \\ \frac{y_{is} - y_{is}^L}{y_{is}^M - y_{is}^L}, & y_{is}^L \leq y_{is} \leq y_{is}^M \\ \frac{y_{is}^U - y_{is}}{y_{is}^U - y_{is}^M}, & y_{is}^M \leq y_{is} \leq y_{is}^U \\ 0, & y_{is} \geq y_{is}^U \end{cases} \tag{5}$$

$$\tilde{y}_{is} = (y_{is}^L, y_{is}^M, y_{is}^U), \quad 0 \leq y_{is}^L \leq y_{is}^M \leq y_{is}^U \rightarrow \tilde{y}_{is} \in [y_{is}^L, y_{is}^U] \tag{6}$$

Equations 3 and 5 define the arithmetical operations on triangular fuzzy numbers \tilde{x}_{ij} and \tilde{y}_{is} . With this operation, an interval that shows the lower and upper bounds for different α -levels is calculated (Eqs. 4 and 6). Application of α -cut interval operations to fuzzy inputs and outputs are as follows:

$$\mu_{\tilde{x}_{ij}} \geq \alpha \begin{cases} \frac{x_{ij} - x_{ij}^L}{x_{ij}^M - x_{ij}^L} \geq \alpha \\ \frac{x_{ij}^U - x_{ij}}{x_{ij}^U - x_{ij}^M} \geq \alpha \end{cases} \quad (7)$$

$$\tilde{x}_{ij} \in [\alpha x_{ij}^M + (1 - \alpha)x_{ij}^L, \alpha x_{ij}^M + (1 - \alpha)x_{ij}^U] \quad (8)$$

$$\mu_{\tilde{y}_{is}} \geq \alpha \begin{cases} \frac{y_{is} - y_{is}^L}{y_{is}^M - y_{is}^L} \geq \alpha \\ \frac{y_{is}^U - y_{is}}{y_{is}^U - y_{is}^M} \geq \alpha \end{cases} \quad (9)$$

$$\tilde{y}_{is} \in [\alpha y_{is}^M + (1 - \alpha)y_{is}^L, \alpha y_{is}^M + (1 - \alpha)y_{is}^U] \quad (10)$$

By substituting the new variables with α -cuts (Eqs. 8 and 10) in model (2), the final presentation for the FIODEA model after the above mathematical manipulation is as shown below:

$$\text{Min } (\tilde{Z}_p)_\alpha = \theta$$

s.t.

$$\begin{aligned} \sum_{i=1}^n \lambda_i x_{ij} &\leq \theta x_{pj}, & \forall j \in J_D \\ \sum_{i=1}^n \lambda_i \tilde{x}_{ij} &\leq \theta \tilde{x}_{pj}, & \forall j \in J_F \\ \sum_{i=1}^n \lambda_i y_{is} &\geq y_{ps}, & \forall s \in S_D \\ \sum_{i=1}^n \lambda_i \tilde{y}_{is} &\geq \tilde{y}_{ps}, & \forall s \in S_F \\ \alpha x_{ij}^M + (1 - \alpha)x_{ij}^L &\leq \tilde{x}_{ij} \leq \alpha x_{ij}^M + (1 - \alpha)x_{ij}^U, & \forall j = 1 \dots J_F \\ \alpha y_{is}^M + (1 - \alpha)y_{is}^L &\leq \tilde{y}_{is} \leq \alpha y_{is}^M + (1 - \alpha)y_{is}^U, & \forall s = 1 \dots S_F \\ \sum_{i=1}^n \lambda_i &= 1 \\ \lambda_i &\geq 0, (i = 1, 2, \dots, n) \end{aligned} \quad (11)$$

4 Illustrative Example

In this section, we illustrate the use of the model developed above through a numerical example. The following hypothetical example considers seven DMUs with three input variables, two deterministic (Input 1, Input 2) and one fuzzy (Input 3) and two output variables, one deterministic (Output 1) and the other fuzzy (Output 2). The fuzzy variables either input or output are triangular fuzzy numbers having a

Table 1 Hypothetical data for the deterministic variables for the DMUs

DMU	Inputs		Output
	Input 1	Input 2	Output 1
A	6.11	4.36	0.21
B	3.66	2.54	0.12
C	1.44	0.48	0.14
D	1.21	0.23	0.10
E	2.75	1.40	0.10
F	4.18	2.74	0.06
H	6.39	3.36	0.18

Table 2 Hypothetical data for the fuzzy variables for the DMUs

DMU	Input 3	Output 2				
A	1.76	7.27	12.27	0.12	0.19	0.27
B	3.85	4.65	5.53	0.00	0.10	0.24
C	1.33	1.88	3.38	0.05	0.10	0.16
D	0.78	1.48	2.06	0.00	0.06	0.16
E	3.22	3.63	4.61	0.02	0.07	0.17
F	4.30	6.13	8.03	0.00	0.06	0.15
H	4.40	8.00	10.68	0.06	0.17	0.30

Table 3 Calculated lower and upper bounds for the fuzzy input and output variables

DMU	Input 3		Output 2	
	Lower bound	Upper bound	Lower bound	Upper bound
A	4.52	9.77	0.16	0.23
B	4.25	5.09	0.05	0.17
C	1.61	2.63	0.08	0.13
D	1.13	1.77	0.03	0.11
E	3.43	4.12	0.05	0.12
F	5.22	7.08	0.03	0.11
H	6.20	9.34	0.12	0.24

minimum, average and maximum values for each DMU. The data for the deterministic variables are provided in Table 1, while that for the parameters of fuzzy variables are assumed in Table 2.

The aim of this problem is to determine the relative efficiency of the DMUs according to our developed model, the FIODEA model. Assume for the problem that the α -cut level for the problem is 0.5.

Before we begin constructing and solving the problem, we need to calculate for each fuzzy variable (input or output) the lower and upper bounds according to the α -cuts approach (Eqs. 8 and 10) and using 0.5 for the α -cut level. The calculated values are provided in Table 3.

Given the values for the deterministic input and output variables provided in Table 1, the calculated lower and upper bounds for the fuzzy input and output variables in Table 3, and using 0.5 as the α -cut level, we construct 7 different FIODEA models for each DMU as has been explained earlier in model (11).

A linear programming formulation for each DMU has to be provided in order to measure its corresponding relative efficiency. The resulting linear programming model for DMU A is as shown below (model 12):

$$\begin{aligned}
 & \text{Min } (\tilde{Z}_A)_{0.5} = \theta \\
 & \text{s.t.} \\
 & 6.11\lambda_A + 3.66\lambda_B + 1.44\lambda_C + 1.21\lambda_D + 2.75\lambda_E + 4.18\lambda_F + 6.39\lambda_H \leq 6.11\theta \\
 & 4.36\lambda_A + 2.54\lambda_B + 0.48\lambda_C + 0.23\lambda_D + 1.04\lambda_E + 2.74\lambda_F + 3.36\lambda_H \leq 4.36\theta \\
 & \lambda_A\tilde{x}_{A1} + \lambda_B\tilde{x}_{B1} + \lambda_C\tilde{x}_{C1} + \lambda_D\tilde{x}_{D1} + \lambda_E\tilde{x}_{E1} + \lambda_F\tilde{x}_{F1} + \lambda_H\tilde{x}_{H1} \leq \tilde{x}_{A1}\theta \\
 & 0.21\lambda_A + 0.12\lambda_B + 0.14\lambda_C + 0.10\lambda_D + 0.10\lambda_E + 0.06\lambda_F + 0.18\lambda_H \geq 0.21 \\
 & \lambda_A\tilde{y}_{A1} + \lambda_B\tilde{y}_{B1} + \lambda_C\tilde{y}_{C1} + \lambda_D\tilde{y}_{D1} + \lambda_E\tilde{y}_{E1} + \lambda_F\tilde{y}_{F1} + \lambda_H\tilde{y}_{H1} \geq \tilde{y}_{A1} \\
 & 4.52 \leq \tilde{x}_{A1} \leq 9.77 \\
 & 4.25 \leq \tilde{x}_{B1} \leq 5.09 \\
 & 1.61 \leq \tilde{x}_{C1} \leq 2.63 \\
 & 1.13 \leq \tilde{x}_{D1} \leq 1.77 \\
 & 3.43 \leq \tilde{x}_{E1} \leq 4.12 \\
 & 5.22 \leq \tilde{x}_{F1} \leq 7.08 \\
 & 6.20 \leq \tilde{x}_{H1} \leq 9.34 \\
 & 0.16 \leq \tilde{x}_{A1} \leq 0.23 \\
 & 0.05 \leq \tilde{y}_{B1} \leq 0.17 \\
 & 0.08 \leq \tilde{y}_{C1} \leq 0.13 \\
 & 0.03 \leq \tilde{y}_{D1} \leq 0.11 \\
 & 0.05 \leq \tilde{y}_{E1} \leq 0.12 \\
 & 0.03 \leq \tilde{y}_{F1} \leq 0.11 \\
 & 0.12 \leq \tilde{y}_{H1} \leq 0.24 \\
 & \lambda_A + \lambda_B + \lambda_C + \lambda_D + \lambda_E + \lambda_F + \lambda_H = 1 \\
 & \lambda_A, \lambda_B, \lambda_C, \lambda_D, \lambda_E, \lambda_F, \lambda_H \geq 0
 \end{aligned}
 \tag{12}$$

Similarly, the relative efficiency models for DMUs B, C, D, E, F, and H are constructed. The models are then solved using GAMS programming language software. The relative efficiency level for each DMU is as shown in Table 4.

A closer look at the efficiency results obtained for the seven DMUs, it could be noticed that three DMUs are

efficient (DMUs A, C, and D), and the remaining four are inefficient (DMUs B, E, and F). Three of the four inefficient DMUs are very poorly efficient, while DMU H is close to being efficient.

For the sake of comparison, we also constructed the relative efficiency models for two different cases; the first while considering all variables being deterministic and the second while considering the fuzzy variables as stochastic. For the latter case we applied the model developed by EL-Demerdash et al. [19]. In the first case, we took the average values for the fuzzy variables as the deterministic values. As for the second case, for the stochastic variables we took the average of the three values for the fuzzy function to represent the mean and assumed the value of variance and covariance between DMUs to be able to run the stochastic input oriented DEA model. The relative efficiencies for these two cases are also provided in Table 4.

From the table, it is evident that the nature of the variables could have a dramatic influence on the resulting relative efficiencies of the DMUs. As illustrated by the values in Table 4, some DMUs have changed status from being efficient to being poorly inefficient and vice versa. Therefore, determining the true nature of the variables is crucial to achieving realistic results regarding the efficiencies and inefficiencies of the DMUs under study.

5 Conclusion and Future Work

A new input oriented DEA model (FIODEA) was developed that deals with fuzzy and deterministic variables. The model is tailored for fuzzy variables with triangular membership functions and solved using the α -level approach. Initially, the approach begins by determining the boundaries for the fuzzy variables. These boundaries are then used along with the α -cut level to formulate and calculate the relative efficiency for each DMU. The presented illustrative example pointed out that the nature of the variables does have an influence of the relative efficiency levels and could toggle the status of the DMU from efficient to inefficient and vice

Table 4 Relative efficiency level for each DMU

DMU	Mix of fuzzy and deterministic variables	Mix of stochastic and deterministic variables	All deterministic variables
A	1	0.59	1
B	0.36	1	0.40
C	1	1	1
D	1	1	1
E	0.44	1	0.46
F	0.29	0.99	0.29
H	0.80	0.84	1


versa. Therefore, it is necessary to identify the nature of the variable from the beginning and apply the appropriate DEA model to achieve reliable results.

As part of the future work, it is the intention of the authors to apply the developed FIODEA model to actual studies. Also, the authors are intending to modify the solving algorithm of the model through considering different membership functions for the fuzzy variables. Further future work, is to develop an integrated input oriented DEA model that is capable of handling and/or deterministic, fuzzy, and stochastic variables.

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Digital Currencies and the Power Shift in the Economy

Asma Salman 

Abstract

The emerging economies are no longer growing as rapidly as in the past. As the technological disruption accelerates, a fundamental change is underway. In an industrialized world where the market is as unpredictable as it gets; the right mix of technology could be a game changer for the financial institutions. It's a power struggle of sorts. The regulatory bodies are struggling to deal with the dynamic shift in market structure due to the eruption of digital currencies. The impact of Ethereum is studied through an estimated model and a montecarlo simulation is applied on its existing dynamic structure. As the currencies are decentralized, the power centralizes and the opportunities that emerge are noteworthy. An impact of the financial technology on the new digitized economy is realized through a time series data and estimations are made for the future.

Keywords

Fintech • Ethereum • Cryptocurrencies • Montecarlo • ADF

1 Introduction

1.1 Digital Currencies

Digital currencies have led the world to believe in an alternative economy. It includes both crypto and non-cryptocurrencies. Bitcoin, Ethereum and the likes have given a new kind of power to the users which is decentralized and anonymous, creating a disruption in the financial markets. The almost risk-free nature has made these

cryptocurrencies superior to the fiat currency and way past the commodities e.g., gold. Bitcoin has become a currency of choice for the internet generation. Mainstream or not, these currencies have created a ripple effect in the economies around the world. Many countries have come up with their own digital currencies amidst the threat of their fiat currencies losing value over time.

The system of central banking is going through an unprecedented change and around 25 trillion-dollar worth of bonds have a negative yield. More than 20 central banks around the world have their interest rates with a negative yield, this has never happened in a few hundred years. The intention of the digital currencies is not to wipe out the fiat currencies but to simply offer an alternative system which excludes the middle men. China has banned several cryptocurrencies which the gurus mark as a sign of success.

2 Literature Review

The current contemporary scenario where different economies are likely to exhibit increased use of digital currency putting the traditional forms of currency at the risk of becoming extinct in the near future. Thus, [1] cryptocurrency is referred as, “any type of digital unit used as a medium for exchange, a unit of account or a form of store of value.” Cryptocurrency transactions are mainly based on blockchain technology; which is a ledger that is in digital form, which helps to provide a permanent record of the transactions between any two parties.

Virtual currency if fully embraced by the different global economies as a medium of exchange, is likely to yield various advantages over fiat currencies [2]. However, the use of cryptocurrencies as a medium of exchange, raises various safety and legal concerns. Virtual currencies are generally decentralized are not under the control of any single authority. Consequently, the lack of a regulatory framework in many countries makes many of the digital currencies unenforceable [3]. Authors presented a comparison between

A. Salman (✉)

Department of Accounting, Finance and Economics, College of Business Administration, American University in the Emirates, Dubai, United Arab Emirates
e-mail: asma.salman@ae.ae

Bitcoin and Ethereum, their similarities and dissimilarities and devising investing options in the long run. Researchers [4], discussed the changing face of currencies from paper to digital and their impact on the economy using a partial least square structural equation model. It also points out the governance barriers faced by cryptocurrencies like the Bitcoin.

Some argue that [5] Bitcoin requires supervision, or it may end up in a bubble being burst. Tapscott [6] author of Blockchain Revolution and one of the top most influencers of the world, quoted: “Ethereum blockchain has some extraordinary capabilities. One of them is that you can build smart contracts. It’s kind of what it sounds like. It’s a contract that self-executes, and the contract handles the enforcement, the management, performance, and payment”.

Eminent researcher [7] analyzed the digital economy using Bitcoins and how trading can help create a positive value in the long run. It concludes that the use of digital coins with a limited supply can help reduce governments’ revenue generated with inflation. Semi strong efficiency of Bitcoin was discussed [8] in the Bitstamp and Mt. Gox markets, showing how the digital currency responds to monetary policy and Bitcoin events. Authors highlighted the absence of regulations thus maintaining that Bitcoin is not affected by monetary policy news. Emphasizing of the revolution in the financial markets, researchers [9] highlighted that many countries still consider the virtual currencies illegal as there is minimum awareness about such assets and the changes that it can bring about.

Moving towards the information retrieval and communication transmission [10] researchers investigate the information transmission between cryptocurrencies like Bitcoin, Litecoin, Ripple, Ethereum and Bitcoin Cash. Using VAR modelling approach, the results signify that the generalized impulse-response functions confirm a strong contemporaneous correlation.

Wallet holders and smart contracts go hand in hand. Researchers [11] argue that cryptocurrencies ultimately depend upon that multilateral agreements Therefore the wallets become creditors and debtors of smart contract.

3 Empirical Analysis

3.1 Methodology

The data for Ethereum is taken from coinmarketcap [12]. To understand the underlying impact of Ethereum, daily data has been taken for the market size of Ethereum, market capitalization and daily closing price [13]. Further analysis is carried out to understand the impact of Ethereum as a currency following a time series data. The sample is taken from Oct 2015 till Oct 2017 (Table 1).

- (a) Total Ethereum in circulation—Market Capitalization
- (b) Estimated output volume
- (c) Ethereum Price Changes

$$\ln\text{ETH}_{it} = \beta_0 + \beta_1 \ln\text{CAP}_{it} + \beta_2 \ln\text{VOL}_{it} + \varepsilon_{it} \quad (1)$$

A regression analysis is used to explain the impact of the variables, Market Capitalization (CAP), Output volume (VOL) and Ethereum (ETH), then the relationship of the regression equation to the model is discussed. The best regression equation, based on the analysis of DW (Durbin-Watson), AIC (Akaike Information Criterion) and SC (Schwarz Criterion) is fitted. The analysis follows the method of Least Squares and includes 732 observations [14] where the sample is taken from 10/31/2015 till 10/31/2017.

From the resultant equation the t-statistics, r-squared and adjusted r-squared show a strong positive relation and suggest that the regression equation fits well as indicated in Figs. 1 and 2.

Table 1 Regression results

Variable	Coefficient	Std. error	t-Statistic	Prob.
CAP	1.03E-08	4.65E-11	220.9838	0.0000
VOL	1.01E-08	1.13E-09	8.918789	0.0000
C	1.579994	0.364713	4.332154	0.0000
R-squared	0.994781	Mean dependent var		74.83529
Adjusted R-squared	0.994767	S.D. dependent var		114.9053
S.E. of regression	8.312438	Akaike info criterion		7.077473
Sum squared resid	50,371.45	Schwarz criterion		7.096308
Log likelihood	-2587.355	Hannan-Quinn criter.		7.084739
F-statistic	69,476.50	Durbin-Watson stat		1.879039
Prob(F-statistic)	0.000000			

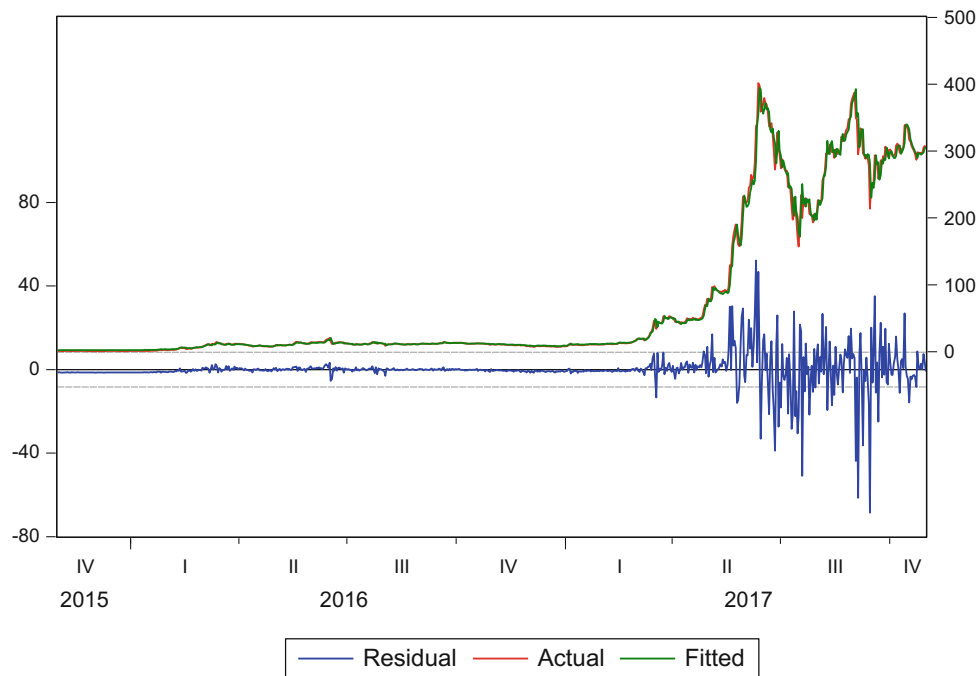


Fig. 1 Residual actual & fitted

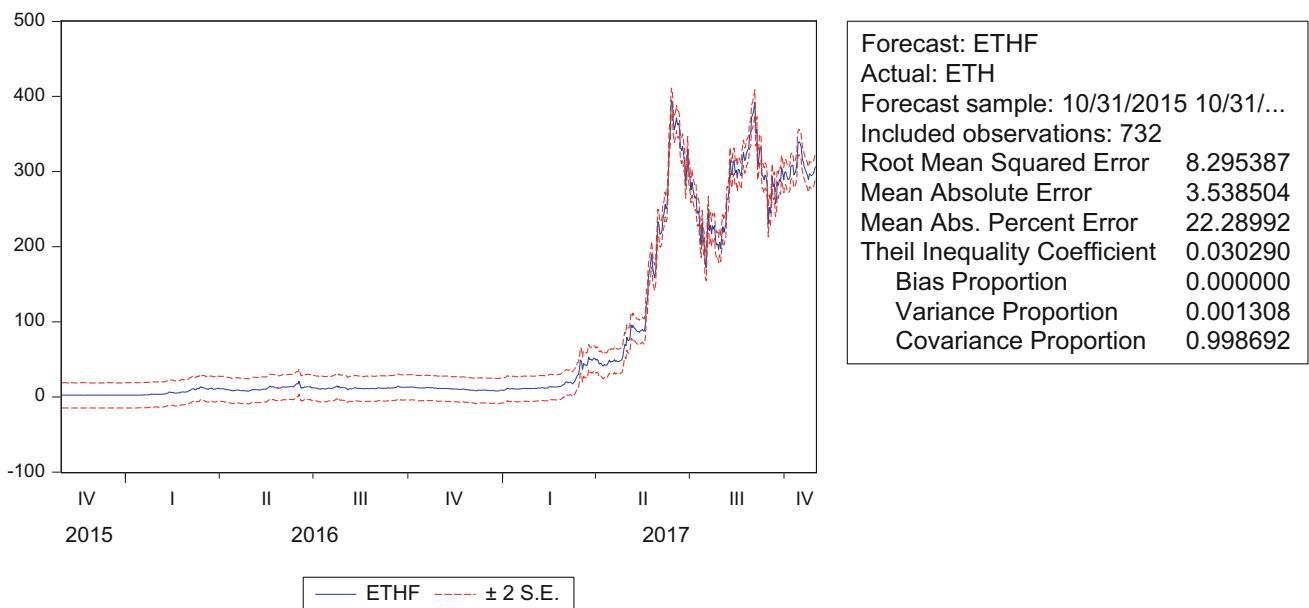


Fig. 2 ETH estimated value denoted as ETHF

3.1.1 The Augmented Dickey-Fuller (ADF) Unit-Root Test

ADF is used under the three conditions for every time series. The random process includes intercept (c) and trend (t), second includes intercept (c) but no trend (0) and

third, the includes no intercept (0) and trend (t). It was observed that each variable under the Augmented Dickey-Fuller test statistic has a unit root at various lag lengths. This augments the data and the model (Tables 2, 3, 4, 5, 6 and 7).

Table 2 Unit Root Test for ETH

Null hypothesis: ETH has a unit root			
Exogenous: constant			
Lag length: 0 (Automatic-based on SIC, maxlag = 19)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.118672	0.9454
Test critical values:	1% level	-3.439068	
	5% level	-2.865278	
	10% level	-2.568816	

*MacKinnon (1996) one-sided *p*-values [15]**Table 3** Augmented Dickey-Fuller test equation for ETH

Dependent variable: D(ETH)				
Method: least squares				
Sample (adjusted): 11/01/2015 10/31/2017				
Included observations: 731 after adjustments				
Variable	Coefficient	Std. error	t-Statistic	Prob.
ETH(-1)	-0.000331	0.002787	-0.118672	0.9056
C	0.441829	0.380881	1.160018	0.2464
R-squared	0.000019	Mean dependent var		0.417187
Adjusted R-squared	-0.001352	S.D. dependent var		8.627058
S.E. of regression	8.632890	Akaike info criterion		7.151768
Sum squared resid	54,330.03	Schwarz criterion		7.164338
Log likelihood	-2611.971	Hannan-Quinn criter.		7.156617
F-statistic	0.014083	Durbin-Watson stat		2.010870
Prob(F-statistic)	0.905568			

Table 4 Unit root test for VOL

Null hypothesis: VOL has a unit root			
Exogenous: constant			
Lag length: 19 (Automatic-based on SIC, maxlag = 19)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.087270	0.7225
Test critical values:	1% level	-3.439307	
	5% level	-2.865383	
	10% level	-2.568873	

*MacKinnon (1996) one-sided *p*-values. [16]

3.1.2 Var Co-Integration Test Statistic

The Johansen Co-integration technique is used to check the behaviour of the variables. The results obtained are presented in Table 8. The co-integration relationships are determined with lag intervals between 1 and 4 with 5% critical values. The unrestricted co-integration rank is applied.

3.1.3 Granger Causality Tests

The Granger causality test is used to analyse further the relationship between the three variables. Pairwise tests are carried out in Eviews and results are shown in Table 9. When the lag is 2, the Granger-cause between the variables does not exist. Hence this proves that the above cause and effect relationship is unidirectional and not bidirectional for ETH.

Table 5 Augmented Dickey-Fuller test equation for VOL

Dependent variable: D(VOL)				
Method: least squares				
Sample (adjusted): 11/20/2015 10/31/2017				
Included observations: 712 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
VOL(-1)	-0.020988	0.019304	-1.087270	0.2773
D(VOL(-1))	-0.423232	0.040429	-10.46863	0.0000
D(VOL(-2))	-0.421392	0.042892	-9.824380	0.0000
D(VOL(-3))	-0.192204	0.045020	-4.269327	0.0000
D(VOL(-4))	-0.336161	0.045611	-7.370109	0.0000
D(VOL(-5))	-0.314966	0.046759	-6.735911	0.0000
D(VOL(-6))	-0.308793	0.048050	-6.426536	0.0000
D(VOL(-7))	-0.302302	0.048597	-6.220525	0.0000
D(VOL(-8))	-0.259025	0.049089	-5.276600	0.0000
D(VOL(-9))	-0.335092	0.048260	-6.943540	0.0000
D(VOL(-10))	-0.372033	0.047625	-7.811702	0.0000
D(VOL(-11))	-0.319605	0.047836	-6.681269	0.0000
D(VOL(-12))	-0.223437	0.048228	-4.632913	0.0000
D(VOL(-13))	-0.239795	0.047467	-5.051783	0.0000
D(VOL(-14))	-0.118514	0.046687	-2.538478	0.0114
D(VOL(-15))	-0.187296	0.045068	-4.155839	0.0000
D(VOL(-16))	0.014144	0.043598	0.324427	0.7457
D(VOL(-17))	-0.200354	0.042840	-4.676828	0.0000
D(VOL(-18))	-0.173585	0.040274	-4.310074	0.0000
D(VOL(-19))	-0.277583	0.037280	-7.445821	0.0000
C	8623545.	8639876.	0.998110	0.3186
R-squared	0.326350	Mean dependent var		518,454.3
Adjusted R-squared	0.306852	S.D. dependent var		2.38E + 08
S.E. of regression	1.98E + 08	Akaike info criterion		41.07917
Sum squared resid	2.72E + 19	Schwarz criterion		41.21391
Log likelihood	-14603.19	Hannan-Quinn criter.		41.13122
F-statistic	16.73778	Durbin-Watson stat		2.036758
Prob(F-statistic)	0.000000			

Table 6 Unit root test for CAP

Null hypothesis: CAP has a unit root			
Exogenous: constant			
Lag length: 0 (Automatic-based on SIC, maxlag = 19)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.001228	0.9574
Test critical values:	1% level	-3.439068	
	5% level	-2.865278	
	10% level	-2.568816	

*MacKinnon (1996) one-sided p-values

Table 7 The ADF test statistic for CAP

Dependent Variable: D(CAP)				
Method: least squares				
Sample (adjusted): 11/01/2015 10/31/2017				
Included observations: 731 after adjustments				
Variable	Coefficient	Std. error	t-Statistic	Prob.
CAP(-1)	3.34E-06	0.002716	0.001228	0.9990
C	39,995,807	34,714,758	1.152127	0.2496
R-squared	0.000000	Mean dependent var		40018741
Adjusted R-squared	-0.001372	S.D. dependent var		7.91E+08
S.E. of regression	7.91E+08	Akaike info criterion		43.81874
Sum squared resid	4.56E+20	Schwarz criterion		43.83131
Log likelihood	-16013.75	Hannan-Quinn criter.		43.82359
F-statistic	1.51E-06	Durbin-Watson stat		1.974551
Prob(F-statistic)	0.999020			

Table 8 The cointegration test

Unrestricted cointegration rank test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical value	Prob.**
None*	0.109396	101.8325	29.79707	0.0000
At most 1*	0.023885	17.60581	15.49471	0.0237
At most 2	4.21E-05	0.030572	3.841466	0.8611
Trace test indicates 2 cointegrating eqn(s) at the 0.05 level				
*denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) <i>p</i> -values				
Unrestricted cointegration rank test (maximum eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical value	Prob.**
None*	0.109396	84.22666	21.13162	0.0000
At most 1*	0.023885	17.57524	14.26460	0.0144
At most 2	4.21E-05	0.030572	3.841466	0.8611
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level				
*denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) <i>p</i> -values				
Unrestricted cointegrating coefficients (normalized by $b^*S11*b = I$):				
ETH	CAP	VOL		
-0.433898	4.41E-09	5.71E-09		
0.292424	-3.04E-09	5.71E-10		
0.506084	-5.44E-09	6.52E-10		
Unrestricted adjustment coefficients (alpha):				
D(ETH)				
-0.136849		0.043791	0.054783	
D(CAP)				
-3609207.		7375010.	23664.82	
D(VOL)				
-67785462		-5530763.	336473.3	

(continued)

Table 8 (continued)

1 Cointegrating equation(s):		Log likelihood	-31390.28	
Normalized cointegrating coefficients (standard error in parentheses)				
ETH	CAP	VOL		
1.000000	-1.02E-08	-1.32E-08		
	(4.7E-11)	(1.3E-09)		
Adjustment coefficients (standard error in parentheses)				
D(ETH)	0.059379			
	(0.13750)			
D(CAP)	1566028.			
	(795492.)			
D(VOL)	29411986			
	(3305522)			
2 Cointegrating equation(s):		Log likelihood	-31381.50	
Normalized cointegrating coefficients (standard error in parentheses)				
ETH	CAP	VOL		
1.000000	0.000000	-6.95E-07		
		(9.7E-08)		
0.000000	1.000000	-67.04459		
		(9.50579)		
Adjustment coefficients (standard error in parentheses)				
D(ETH)	0.072184	-7.37E-10		
	(0.16581)	(1.7E-09)		
D(CAP)	3722655.	-0.038339		
	(948338.)	(0.00971)		
D(VOL)	27794661	-0.282254		
	(3984665)	(0.04080)		

Table 9 The Granger causality test

Null hypothesis:	Obs	F-statistic	Prob.
CAP does not Granger cause ETH	730	0.40839	0.6649
ETH does not Granger cause CAP		59666.8	0.0000
VOL does not Granger cause ETH	730	1.98539	0.1381
ETH does not Granger cause VOL		36.0168	1.E-15
VOL does not Granger cause CAP	730	30.7228	2.E-13
CAP does not Granger cause VOL		33.3527	1.E-14

4 Conclusion

The unit root analysis, ADF test statistics and the monte carlo simulation confirm the long term and short-term relation among Ethereum use in the form of smart contracts through the use of Blockchain. To categorize the dynamic structure of Ethereum, the monte carlo simulation is applied through the impulse response functions in the model. It shows how shocks to any one variable filter through the

model can affect every other variable and eventually feed back to the original variable itself. Monte Carlo simulation is best employed through possible random movements in the model. This perfectly fits the scenario of Ethereum. There are two components to a stock’s price movements: drift, which is a constant directional movement, and a random input, representing market volatility. By analyzing historical price data, the drift, standard deviation, variance and average price movement for a security is determined. These are the building blocks of a Monte Carlo simulation. The horizontal

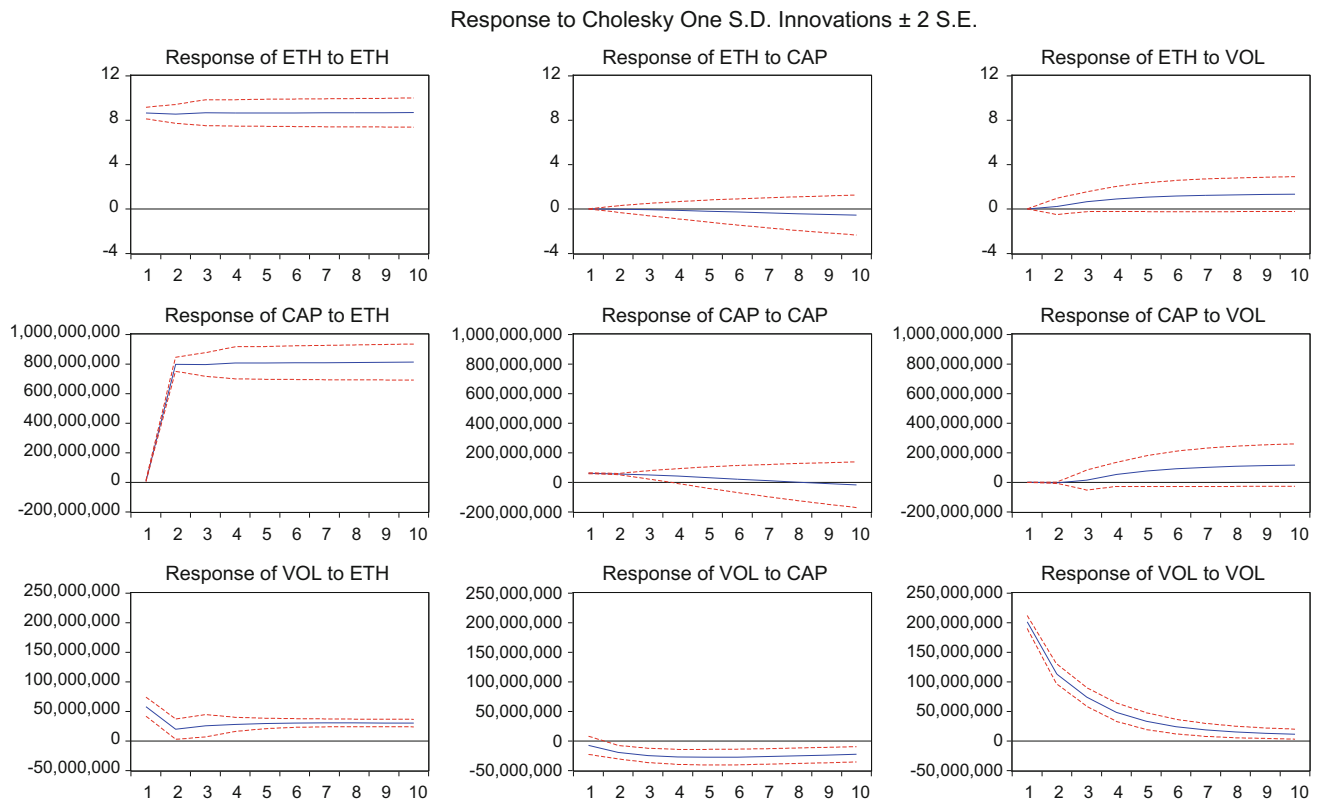


Fig. 3 Impulse response function

spool in Fig. 3 delegates trace periods of the response function and the vertical spool delegates responses of dependent variables to independent variables.

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Evaluating Inclination of Youth to Start Enterprise: A Study in Oman

Bilal Ahmad Pandow  and Ali Salem Omar 

Abstract

The study analyses the readiness of educated youth to start businesses in Sultan-ate of Oman by assessing education, checking skills level, and opportunity identifications. In addition, the study examines the impact of education on young people readiness towards business activity and its success components. The hypothetical deductive approach through a structural equation model is used in this study, in a 12,551 population of which 373 students constituted our sample across various colleges and universities in Oman. The findings highlight the effect of education, skills, awareness level and business trainings of students towards starting businesses and the important role of education on all factors, including business skill ability. This study considers human beings as changeable beings during lifetime and provides evidence for those interested in the business that can influence the innovative commerce ventures.

Keywords

Youth • Readiness • Opportunity • Entrepreneurship • Oman

1 Introduction

The economic downturn caused by the oil price dip in GCC markets since 2014 has seriously awoken Oman, particularly its youth which constitute 30% of its population [1] as mentioned in Oman National Agency in 2015, along with an unemployment rate that averaged 7.17% in 2016 according to International Labor Organization. The same rate is

expected to rise and stand at 7.80% by 2020 according to the econometric models of Trading Economics. The sultanate of Oman in near future will have no other choice but to start working towards reducing reliance on oil revenues. Diversification of economy has therefore become a must for the Omani sultanate to increase its sources of income within the 9th Five-Year Plan that commenced in 2016 hoping to realize Oman vision 2020, and paving the way towards Oman vision 2040. The plan, among other things has been focusing on the vital role of the private sector and its positive implications on the economic growth.

The concept or the way forward is clearly stated within the objectives of Oman Vision 2020 [2] and 2040 in terms of businesses creation as part of the solution and its positive implications on the economy through the evaluation of the GDP retained as an indicator of the economic growth based on its added values created by companies ($GDP = \sum_{i=0}^n AV_i + \text{taxes}$). It alludes to the fact that the more businesses Oman will be having the more jobs creation and added values the country will observe and appreciate in favor of its economic growth, upturn and its way on its population's standard of living. However, Omani young people seem to keep struggling to get into the world of business despite the rigorous efforts made by the government. The sultanate of Oman has created a good number of public and private organizations to train and financially support new budding entrepreneurs to achieve their dream. The traditional and non-traditional banks have extended their support through various schemes and setups such as Al Rafdd Fund, Riyada, Sanad Fund, SME Development Fund, Intilaaqa, Sharakah, Injaz, Startup Oman, Ta'aseess, SAS program and many more.

The *Times of Oman* recently stated that Oman has not been able to create enough employment because the number of new businesses launched every year has been declining significantly in recent years. Setting up of new businesses saw a fall of 28% on an average in the last four years [3]. The main organizations which are helping to boost the private sector agreed on these facts and key stakeholders are

B. A. Pandow (✉)
University of Kashmir, Hazratbal, Srinagar, 190006,
Jammu and Kashmir, India
e-mail: ibilalhussain@gmail.com

A. S. Omar
Middle East College, Muscat, Oman

also stating the same. This is the primary reason for this study along with a need felt for an evaluation of youth readiness to set up their own businesses in Oman.

The hypothetical deductive approach through a structural equation model is used in this study. Of an Omani population of 12,551 which attends college in higher education a sample of 373 students enrolled in Middle East College (MEC) and Sultan Qaboos University (SQU) has been used as a representative number for the in this study. The findings highlight the effect of education, skills, and opportunity identification of students towards starting businesses and the important role of education on all factors, including business skill ability.

The sultanate of Oman is finding ways and means to diversify its economic basket so as to move away from the oil dependency in parallel to the level of the literacy rate which is going up along with more and more Omani's enrolling for higher studies. However, the rate of unemployment rate is going slightly upwards and is a matter of concern for the government. One of the way forward for Omani's is to start taking up businesses. However, the denizens are still not ready foraying into new business ventures. This is the primary question that the study aims to undertake. In the process it hopes to come up with interesting findings to be able to provide relevant suggestions and recommendations.

2 Literature Review

There are numerous studies like [4] conducted which suggest that the relationship between schooling and performance is noteworthy and positive and is in tune with economic theory. Hence, for this study we have chosen the variable of education and to check the relationship between education and entrepreneurship.

Besides, there are studies where the results have shown that the effect on respondents' self-assessed skills were not significantly different from zilch and the point estimates were even negative [5]. While, researchers have argued that perceptual variables like attentiveness to prospects, fright of letdown, and self-assurance about one's own skills are also significant [6].

In almost the two past decades, several economies have been looking for ways to make use of youth's talents in favor of new venture start-ups [7]. There are obviously many business opportunities down the road but only a tiny percentage of youth is able to identify and turn them into productive output. According to [8, 9] a good business idea does not necessarily mean a good opportunity as a small number of candidates got very often funded out of hundred business ideas presented to investors. The same researchers

will also stress on the fact that successful nature of new business start-up depends on youth' readiness to turn their ideas into business. In other words the discovery of opportunity and ability to utilize it depends mainly on readiness of youth to partake in such entrepreneurial activities. Others will also rightly draw the attention that the low level of untapped open business opportunity (market niche) almost all over the world is a matter of lack of necessary skills to run the entrepreneurial activities [10]. Other studies have showed that another drivers for setting up a new venture is desire for independence [11, 12]. De-sire for independence refers to the use of personal judgement on entrepreneurial behaviors rather than being moved to act through external factors [11]. Desire to be independent occurs because of many personal reasons and individuals ended up willing to be their own boss [10]. Besides, various entrepreneurship programs, seminars and conferences are organized to find out the reasons why youth are not setting up their future venture in order to suggest solutions. Many countries have been invested in various entrepreneurship programs to see whether students can exploit untapped business opportunities. Various approaches have been used to encourage the youth towards entrepreneurial activities such as giving bank loans, business facilities and access to finance (capital) in order to influence their career options. In other instances, youths are given opportunity to submit their business proposals to get private firms or government funds in case of viable business opportunities. All these approaches have been used to test the entrepreneurial readiness of youth. Despite such effort, the youth participation in entrepreneurial activities still calls for concern. This is supported by research [13] that there are few research evidences on youth entrepreneurial activities despite huge demand from various sectors in the economy.

According to the [14], an unwavering government combined with comparatively low taxes makes Sultanate of Oman an attractive investment target for entrepreneurs, which is an encouraging sign for the youth of Oman. However, in a study by [15] reveals that the causes like non-discrimination of gender, advancement opportunities and physical working conditions have a critical impact in motivating learners to take up tourism-related jobs. Their empirical results also divulge that the high risk of misfortunes, non-tourism wife partialities and Omani old-style values discourage tourism. Hence, a normal development concerning setting up of such tourism-related entrepreneurial accomplishments is disenchanted.

Also, in 2017 a study [16] in an empirical study show that though ex-students in Oman have an optimistic approach towards entrepreneurship, inclination to start their self-business after completing their education is low. They stress on growing graduates' professional awareness and informing

them about the business risk, in addition to endorsing entrepreneurship teaching can really impact their out-look towards setting of private enterprise.

In addition there are studies [17] that have discussed framework for perceptions and attitudes of university students toward entrepreneurship in Oman, and also mentions how perception of the available prospects, obstacles, reasons, entrepreneurial experience, family backing and principles were identified and formulate the conceptual framework. Besides, there are books like the one by [18] written on how entrepreneurship has presumed super position for quickening economic development both in developed and developing countries. Based on the World Bank report on doing of business report and Oman can be seen in Fig. 1 ranked at 66 position.

The rankings in the Fig. 1 are benchmarked to June 2014 and based on the average of each economy's distance to frontier (DTF) scores for the 10 topics included in 2015s aggregate ranking. The distance to frontier score benchmarks economies with respect to regulatory practice, showing the absolute distance to the best performance in each Doing Business indicator. An economy's distance to frontier score is indicated on a scale from 0 to 100, where 0 represents the worst performance and 100 the frontier. For the economies for which the data cover 2 cities, scores are a population-weighted average for the 2 cities. Based on the Fig. 1, the Sultanate of Oman is raked below UAE, Saudi Arabia, and Bahrain, however, the country is better placed compared to Iran, Iraq and Jordan.

It is worth mention that the scale: score 0 center, score 100 outer edge. Based on the Fig. 2 the Oman scores better on parameters like paying taxes, trading across borders, starting a business, dealing with construction permits getting electricity, registering property. However, the country scored

low on parameters like getting credit, protecting minority investor, enforcing contracts, and resolving insolvency. Some of the reforms that the country have undergone over past years are mentioned below in the Table 1, which are of great significance as far the starting business in Oman is concerned.

2.1 Hypothesis

H₁: There is positive and significant relationship between education and entrepreneurial readiness of youth towards new business start-up

H₂: There is positive and significant relationship between business skills and entrepreneurial readiness of youth towards new business start-up

H₃: There is positive and significant relationship between awareness level and entrepreneurial readiness of youth towards new business start-up

H₄: Inclusion of business training moderates the relationship between education, skills, awareness level and entrepreneurial readiness of the participant group.

2.2 Objective of the Study

The study aims to examine the relationship between the readiness in the recently educated Omani youth towards setting up new business ventures while taking factors like education, skills and awareness among these youth into consideration. This study also examines the influence of business training on the new and potential entrepreneurs.

3 Research Design

The purpose of the study is hypothetical deductive approach. Maximum likelihood estimator is used as the data analysis techniques through structural equation modelling (SEM). This technique is used because this study involves large sample size. This method yields estimates that seek to maximize the likelihood that the observed data come from a population consistent with the implied model as shown in Fig. 3 and the technical details of the study can be found in Table 2.

3.1 Variables

Dependent variable. This study used a Likert-type five-point scale (ranging from 1 strongly disagree to 5 strongly agree). The purpose of the items is to test the level of students'

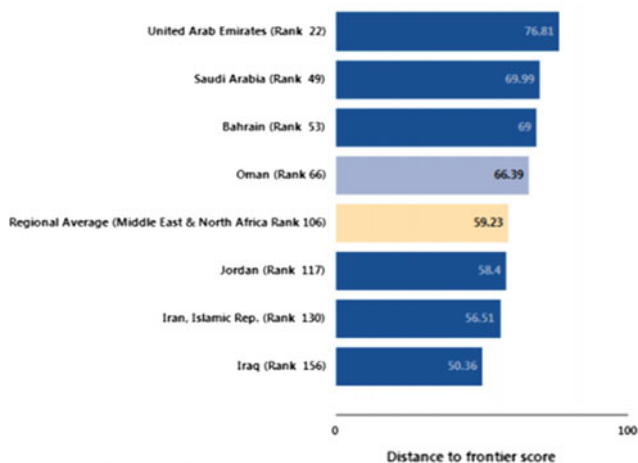


Fig. 1 Ranking of Oman and comparator economies on the ease of doing business. *Source* The World Bank report on 'doing business 2015' economy profile-Oman

Fig. 2 Distance to frontier scores on doing business—Oman. Source The World Bank report on ‘doing business 2015’ economy profile-Oman



Table 1 Reforms made in Oman for starting a business

DB year	Reform
DB 2010	Oman made starting a business easier by introducing online name registration and payment at the registry with a prepaid card
DB 2012	The one-stop shop in Oman introduced online company registration and sped up the process to register a business from 7 days to 3 days

Source The World Bank report on ‘doing business 2015’ economy profile-Oman

Fig. 3 Model used for this paper

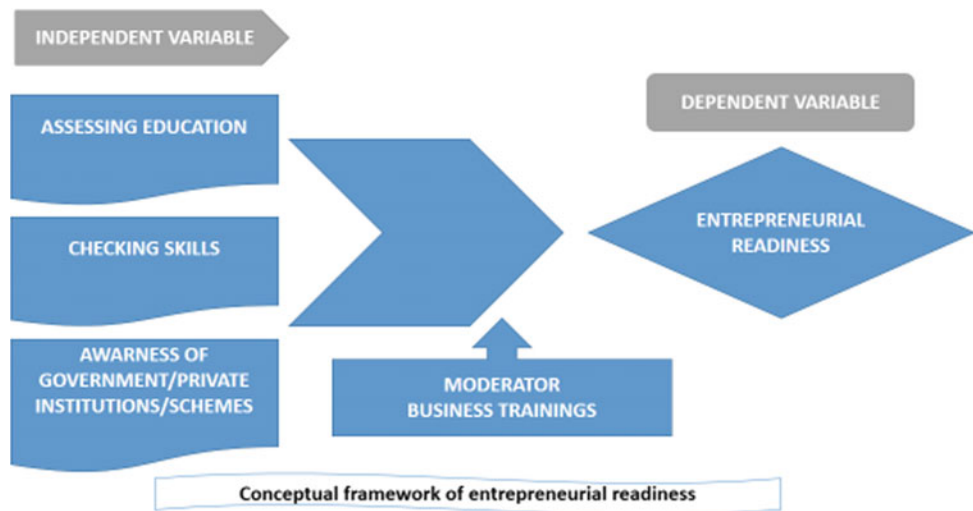


Table 2 Technical details of the research

<i>Geographic location:</i> Muscat, Oman
<i>Methodology:</i> Structured questionnaire
<i>Sampling procedure:</i> Simple random sampling
<i>Study population:</i> 12,551 students of various colleges and universities
<i>Sample size:</i> 373 (491 respondents)
<i>Data collection period:</i> March–April, 2017

business/entrepreneurial readiness towards new business start-up. This scale was adapted from [19].

Independent variables. In this aspect, the study uses Likert-type five-point scale adapted from [19]. The predictor variables are separated into three parts. The first part uses a Likert-type five point scale (ranging from 1 strongly disagree to 5 strongly agree) for constructs such as assessing

education of the second and third perspective uses a Likert-type five-point scale (ranging from 1 not at all; 2 fair; 3 good; 4 very good; 5 excellent) to test the checking skills and awareness of government/private institutions/schemes construct.

Control variables. The study will indicate the differences in the demographics of the respondents ranging from gender,

age, and educational background. Data were obtained from the following controlled variables: age, gender (1 = male, 0 = female), age was measured using ratio data. The control variables are analyzed based on descriptive analysis.

Moderating variable. According to [20], moderation takes place when the independent variable and the moderating variable have mutual effects on variance of dependent variable than that explained by the direct effect. This moderator variable of this study is measured using [21] approaches. The data are divided into two parts the participant group and non-participant group. This moderator is tested by asking the students on whether they participated in business training (1 = yes, 0 = no). In this approach, the direct effect of the constructs will be examined [22].

3.2 Measurement Validity

Since the scale and the variables used in this study have been modified in different perspective, there is need to carry out a confirmatory factor analysis using SPSS to evaluate data validity and reliability, and significance of each items [22]. The significance level will be measured at 5% level. The PLS path modeling method was developed by [23] and the PLS algorithm is essentially a sequence of regressions in terms of weight vectors [24]. The weight vectors obtained at convergence satisfy fixed point equations [25] for a general analysis of such equations and ensuing convergence issues.

4 Results and Discussion

The majority of the participants in the sample (67.3%) are in the age group of 20–25 years, followed by 25–30 years which consists of almost 20% of the population. Also, over 60% of the respondents were females, though both the genders were targeted. However, females participated more actively in the survey than their male counterparts in the survey. Over 75% of the respondents espoused an advanced vocational training/diploma/bachelors to their credit. 18.5% claimed to possess school leaving certificate, while 5% were had masters and Ph.D.s. to their credit. Only 38.9% of the sample population had undergone some business trainings in the past while 61% of the respondents claimed to have never had a chance to benefit from business/entrepreneurship training during their studies (Charts 1 and 2).

We have used the Partial Least Squares (PLS) Algorithm path modeling method which was developed by [23]. In accordance with the Fig. 4 it is clearly visible that the IV1: Accessing Education variable moderately effects the IV2:

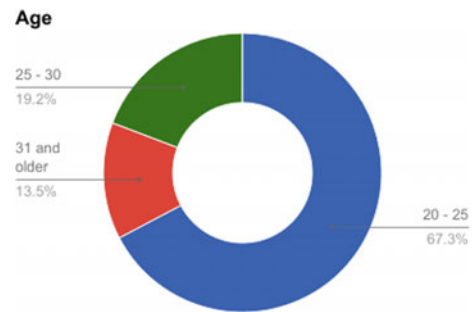


Chart 1 Age group

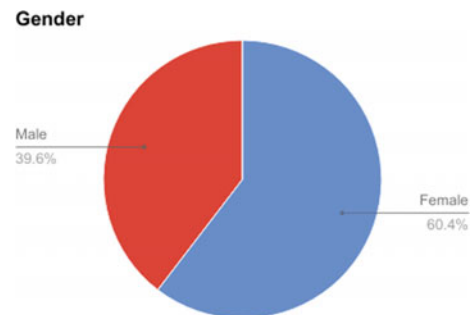


Chart 2 Gender

Checking skills and IV3: Awareness of the government and other entrepreneurship avenues to the tune of 34.9 and 35.9% and in turn the IV2 has a larger impact of 45.3% on the DV: readiness of the students for starting new business. While IV1 and IV3 both have lesser effect on DV of 11 and 16.4% respectively. However, the total effect of all the three independent variable IV1, IV2 and IV3 on DV is moderately at 37.6%.

The PLS path modeling estimation for the sample data is shown in the Table 3. And the R^2 of the respective variables is also mentioned along with the path coefficients and total effects.

The above mentioned Fig. 5 is the result of bootstrapping which is a nonparametric procedure that allows testing the statistical significance of various PLS results like path coefficients, Cronbach's alpha, and R^2 values. And accordingly following f-square test is performed as mentioned in the Table 4.

For checking the validity the following Table 5 shows the construct reliability and validity of the model. And it can be seen that Cronbach's alpha for all the variables is above 0.6, also the composite reliability also stands above 0.7 and AVE for awareness variable is at 0.597, for skills it is 0.626 while it is 0.479 for the education variable.

By looking at the Fig. 4 and 5; Tables 3 and 4 we can make the following observations.

Fig. 4 Path coefficients and total effect of the latent variables

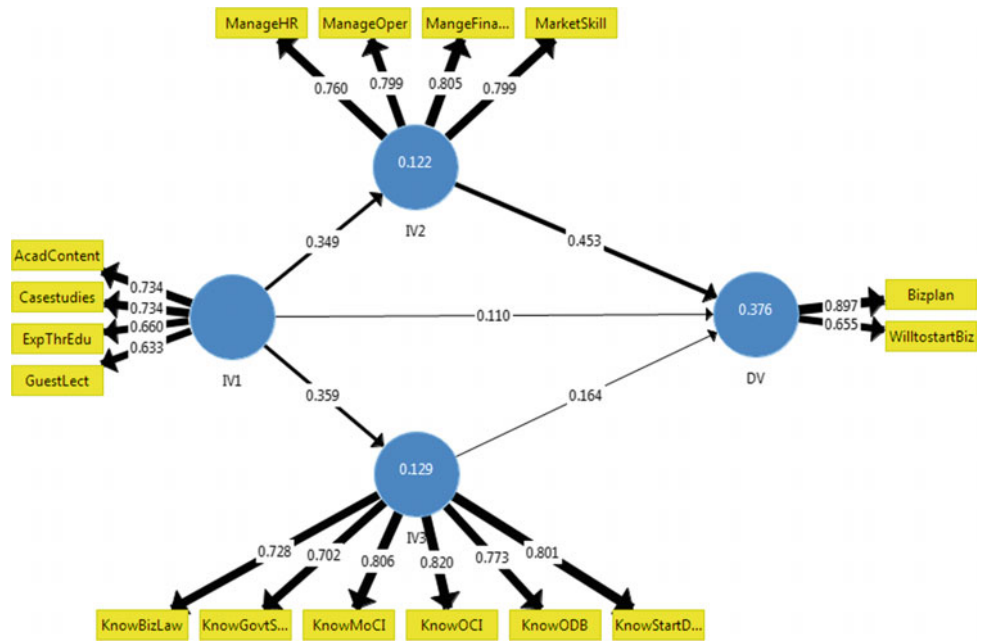


Table 3 Path coefficients and total effects

	Readiness	Awareness	Skills
Awareness	0.164		
Education	0.110	0.359	0.349
Skills	0.453		
R square	0.376	0.129	0.122

Fig. 5 Path coefficients and total effect of the latent variables

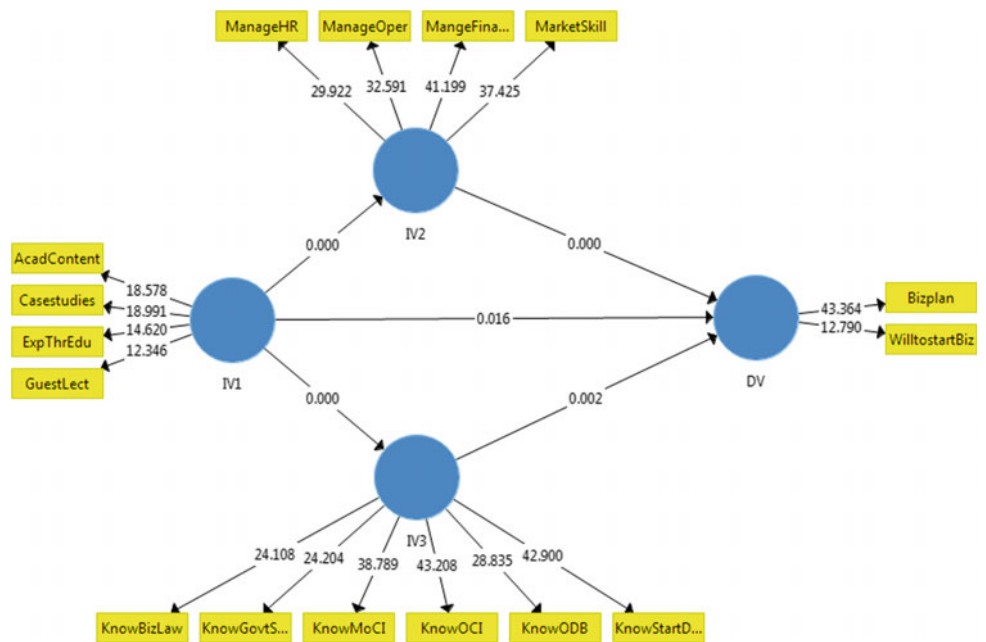


Table 4 Table showing f-square test

	Mean	SD	T statistics	P values
Awareness → readiness	0.032	0.020	1.415	0.158
Education → awareness	0.154	0.049	3.018	0.003
Education → readiness	0.019	0.014	1.170	0.243
Education → skills	0.146	0.047	2.957	0.003
Skills → readiness	0.222	0.050	4.334	0.000

Table 5 Table showing Cronbach's alpha (CA), construct reliability (CR) and average variance extracted (AVE)

	CA	CR	AVE
Awareness	0.864	0.899	0.597
Education	0.650	0.785	0.479
Skills	0.801	0.870	0.626

4.1 Explanation of Target Endogenous Variable Variance

The coefficient of determination, R^2 , is 0.376 for the readiness to start the business endogenous latent variable. This means that the three latent variables (Education, Knowledge, and Skills) moderately explain 37.6% of the variance in readiness to start the business.

4.2 Inner Model Path Coefficient Sizes and Significance

The inner model suggests that skills has the strongest effect on readiness to start the business (0.453), followed by awareness (0.164) and education (0.110).

- The hypothesized path relationship between skills and readiness to start business is statistically significant. This is in conformity with the [26] for the role of resources and skills in the decision making for entrepreneurial activity.
- The hypothesized path relationship between awareness of government & other schemes of starting business and readiness to start business is statistically significant. The results are in tune with the study [27] suggesting that the learners can even be strengthened to the point of affecting from opening recognition to setting of start-ups.
- However, the hypothesized path relationship between education and readiness to start is not statistically significant. This is because its standardized path coefficient (0.110) is almost equal to 0.1. And its P value is at 0.243 which is greater than 0.1. A study [28] indicate that inspiring effect of entrepreneurship education on learners' intent to become entrepreneurs or self-employed was seen in the long-term but a discouraging effect on their intentions in the short-term.

- Thus we can conclude that: skills and awareness of government & other schemes of starting business are both moderately strong predictors of readiness to start business, but education does not predict readiness to start business directly.

In accordance with the Fig. 6 after using the moderator business training, it is clearly visible that the IV1: Accessing Education variable moderately effects the IV2: Checking skills and IV3: Awareness of the government and other entrepreneurship avenues to the tune of 41.2 and 40.4% respectively and in turn the IV2 has an larger impact of 45.6% on the DV: readiness of the students for starting new business. While IV1 and IV3 both have lesser effect on DV of 13.3 and 17.2% respectively. While, the total effect of all the three independent variable IV1, IV2 and IV3 on DV is moderately at 43.1% (Fig. 7).

After moderation the p value of Awareness → Readiness has gone down from 0.158 to 0.130, for also Education → Readiness it has went down from 0.243 to 0.140 and for skills there is no change and still stands statically significant at 0.000. Hence, the hypothesis that inclusion of business training moderates the relationship between education, skills, awareness level and entrepreneurial readiness of the participant group is accepted.

The multi-group analysis was conducted for the model as it allows to test if pre-defined data groups have significant differences in their group-specific parameter estimates (e.g., outer weights, outer loadings and path coefficients).

As can be seen in the above mentioned Table 6 for checking the effect of the control variable on the other variables in the model, the test for bootstrapping was conducted. It is found that effect of Awareness → Business training in case of males is more compared to female as the p-value for the both is 0.262 and 0.582 respectively. Similarly for Awareness → Readiness p-value stands at 0.008 and 0.043 for males and females respectively. Likewise,

Fig. 6 Path coefficients and total effect of the latent variables using moderator

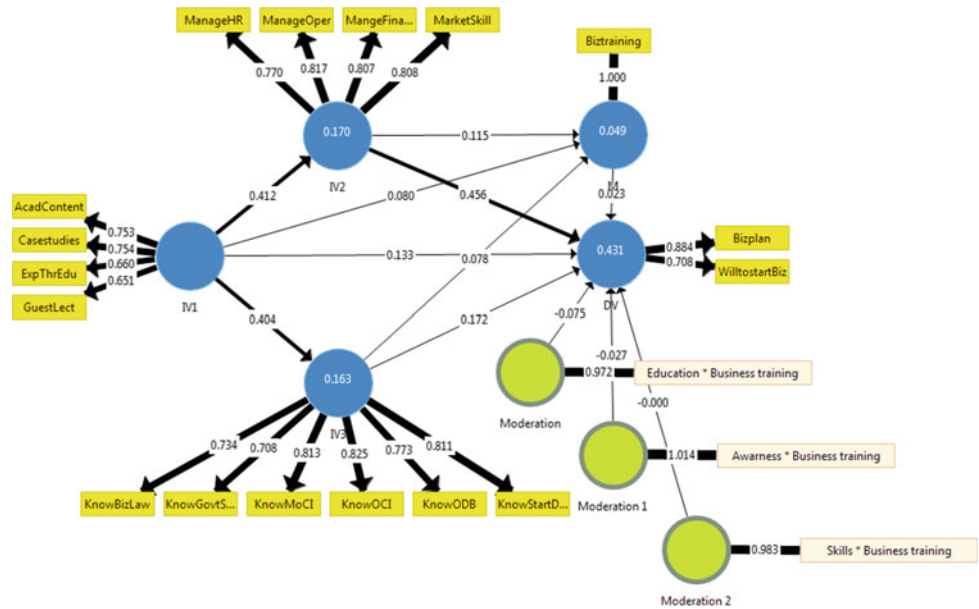
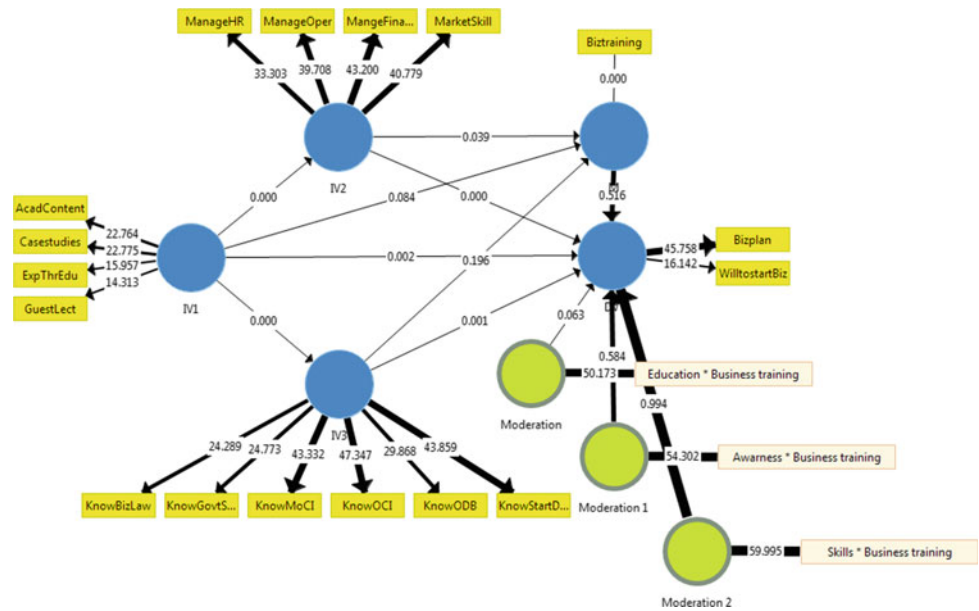


Fig. 7 Path coefficients and total effect of the latent variables using moderator



p-values can be found in the Table 6 on each construct for both males and females (Table 7).

5 Suggestions by Youth

When asked to recommend or share their experiences regarding business initiatives in Oman, only 134 students responds offer their suggestions. While some of them would like to see more flexibility in government regulations to allow new businessmen an easy and smooth start, others

would like to see governmental support especially financial support, to be able to launch their first business ventures. Still others, would like to involve senior businessmen to help and coach students to set up their business. It was also suggested the experts from outside Oman could be enlisted for this purpose. Another interesting suggestions was to bridge the gap between educational institutions, government agencies and SMEs owners in Oman. Besides, the students expected the Sultanate of Oman to set up specialized business schools to help in the preparation of a new generation of businessmen in the country.

Table 6 Table checking the relationships between variables

	Mean	SD	T statistics	P values
Awareness → readiness	0.035	0.021	1.518	0.130
Education → readiness	0.027	0.016	1.477	0.140
Skills → readiness	0.231	0.050	4.459	0.000

Table 7 Bootstrapping for the control variable gender path coefficients (PC)

	PC (F)	PC (M)	t- (F)	t- (M)	p- (F)	p- (M)
Awareness → business training	0.041	0.112	0.551	1.124	0.582	0.262
Awareness → readiness	0.139	0.238	2.024	2.656	0.043	0.008
Business training → readiness	0.058	-0.017	1.262	0.263	0.207	0.793
Education → business training	0.188	0.000	3.087	0.053	0.002	0.958
Education → readiness	0.124	0.118	2.010	1.667	0.045	0.096
Skills → business training	0.046	0.149	0.706	1.635	0.481	0.103
Skills → readiness	0.455	0.460	8.346	6.376	0.000	0.000

6 Conclusion

The study concludes that the spirit of entrepreneurship among the Omani youth is not particularly high. Many reasons have been cited to explain this lag. The principal among them being the absence of any entrepreneurial technical schools in the country, and the fact that the economy of Oman is not really diversified, which ensures that there is very little availability of skilled manpower to start a new business venture. Thus it is imperative that there should not only be more focus on providing skill based learning in educational institutions in Oman, but also that business training programmes ought to be initiated to help upcoming entrepreneurs to realize their potential. A recommendation on these lines is very much in tune with research findings in the past [29]. These findings have emphasized the positive impact made on young minds by the introduction of entrepreneurship education. Studies have found that education has an encouraging and evolving impact towards entrepreneurship intent [30].

Besides, the focus should be on skill based learnings in the educational institution in the sultanate of Oman which is in alignment with the research finding that specialization of entrepreneurship education is not enough for future entrepreneurship. Instead, it is diversity of education along with introduction of skills that has positive influence on entrepreneur's net worth [31, 32] also suggest that personal skill affect entrepreneurial intentions.

While focusing on entrepreneurial education and imparting skills is a must, the government must also work towards promotion of various schemes which are available to the perspective entrepreneurs. This may include

facilitating easy loan schemes to emerging businessmen besides providing other kind of technical support to them. The Sultan of Oman must use his personal stature to develop business networks with organisations outside the country, who would be willing to support local business initiatives, while also providing new technical skills to the native entrepreneur.

Besides, the focus has to be on all-inclusiveness so as to cater both the genders for overall development of enabling environment for start-ups. Also, some studies evaluated that the relationships amongst the possibility of initiating a business which they have found that it doesn't depend on gender [33, 34]. Also, some studies [35] have suggested for introduction of the women entrepreneurship programme.

7 Future Research & Limitations

This study has a limited scope as it is based on the respondents based in Muscat, Oman and is based on the presumption that Muscat being the capital of the country attracts the students from most regions of the country. And the study is conducted based on the responses from both private and public education institution and both of these institution are of high credibility in the region. Also, the methodology employed in the study is of structured questionnaire and inherits all its limitations.

The future research can be taken with a higher sample for the study and can include more factors. Also, the research can be taken for other regions of the Sultanate of Oman like Sohar, Dofar regions to make the ambit of research more wider and for all inclusiveness.

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Evidence-Based Tobacco Control Mobile Apps Based on Federally Funded Research Projects

Alexander V. Prokhorov, Salma K. Marani, and Mario R. Luca

Abstract

Tobacco use and exposure to secondhand smoke remain worldwide public health problems. We report results from three studies. Project ASPIRE and Project CASA are for bilingual participants (English and Spanish) utilizing interactive-computer-technologies and printed fotonovelas. Project Team utilized a continuing education training for physicians' and pharmacists' tobacco cessation counseling. Once a health-related research project is complete one of the challenges is to find a way to successfully disseminate this health information to the general public. The increasing popularity of health-related apps and the successful results of our research studies encouraged us to develop a group of evidence-based mobile apps. We developed three mobile apps corresponding to these studies: Tobacco Free Teens, Tobacco Free Family, and QuitMedKit. A fourth mobile app, Vaper Chase, was developed from evidence based data from various sources reflecting the increasing use of e-cigarettes and hookah in the USA and worldwide.

Keywords

Tobacco use • Secondhand smoke • Community • Health-care-provider • iOS-apps • Android apps

1 Introduction

Tobacco use and exposure to second hand smoke continue to be a major public health problem worldwide. The 2014 Surgeon General's report [1] shows that in the United States despite declines in the prevalence of current smoking, the annual burden of smoking-attributable mortality currently is estimated to be about 480,000, with millions more living with smoking-related diseases.

Smoking impacts nearly every organ of the body. Annually tobacco kills more people than alcohol, heroin, cocaine, suicides, auto accidents, fire and AIDS combined. Approximately \$300 billion in direct and indirect costs are attributable to tobacco use. It contributes to cancer, diabetes, heart disease, stroke, birth defects and other diseases. Nicotine is as addictive as heroin and cocaine and new and emerging tobacco products pose an additional and significant problem due to misconceptions about their health consequences. The evidence in the 2014 report expands the list of diseases and other adverse health effects caused by smoking and exposure of nonsmokers to tobacco smoke including liver and colorectal cancer, diabetes mellitus, inflammation, immune dysfunction and rheumatoid arthritis.

In order to contribute to tobacco control in the United States and globally our research team has conducted a number of federally funded studies utilizing state-of-the-art theoretical concepts and interactive computer technologies. One of the technologies we employ are mobile health apps. In recent years many physicians and other health care providers have incorporated the use of mobile technology into their health practice. Recent surveys have shown that 47% of physicians who own mobile phones use them to show their patients videos or images. In addition, about 33% of physicians have recommended mobile apps to their patients [2].

Here we describe three community based research projects addressing tobacco prevention and secondhand smoke, Project ASPIRE, Project CASA, and Project TEAM and the

A. V. Prokhorov (✉) · S. K. Marani · M. R. Luca
The University of Texas MD Anderson Cancer Center, Houston,
USA
e-mail: aprokhor@mdanderson.org

S. K. Marani
e-mail: smarani@mdanderson.org

M. R. Luca
e-mail: mluca@mdanderson.org

corresponding mobile apps, “Tobacco Free Teens”, “Tobacco Free Family”, and “QuitMedKit” that are based on these projects. These apps are currently available for downloading from the Apple App Store (iPhone domain) free of charge.

Additionally, we describe the “Vaper Chase” app which is based on recent data showing increasing use of e-cigarettes and hookah among young adults in the USA and worldwide. “Vaper Chase” is available from the Apple and Google Play stores (all devices) also free of charge.

2 Project ASPIRE—A Smoking Prevention Interactive Experience

2.1 Background

Youth-oriented smoking prevention and cessation programs utilizing state-of-the-art theoretical concepts and computer technologies hold considerable promise. Few computer-based applications have examined effectiveness at long-term (18 months), especially for high risk students. Project ASPIRE was designed to address this objective.

2.2 Methods

ASPIRE is a theoretically based interactive, multimedia smoking prevention curriculum for culturally diverse high school students. Content for our intervention was based on the PRECEDE model [3], which identifies the predisposing determinants of smoking behavior. An adolescent’s susceptibility to smoking initiation is the result of multiple social and environmental factors. An understanding how these factors operate in combination is important to guide adolescent smoking prevention programs. Project ASPIRE was a nested-cohort, group-randomized trial designed to compare a CD-ROM-based intervention for smoking prevention against the effect of a standard-care intervention (National Cancer Institute’s *Clearing the Air* self-help booklet). Sixteen predominantly minority, inner-city high schools were randomly assigned to receive ASPIRE or a standard care booklet.

2.3 Results

Of 1160 students who completed the 18-month survey, 1098 were nonsmokers at baseline. At 18-month smoking initiation rates were significantly lower in the ASPIRE condition compared to controls (1.9% vs. 5.9%, $p < 0.05$). We evaluated whether the intervention had a differential effect on smoking for high-risk students. Using the exact logistic

regression model post hoc comparisons revealed smoking initiation rates significantly lower in intervention compared to control among students with peer pressure, parental smoking, lower resistance skills and students with depression. An additive risk factor model was used to demonstrate the effect of multiple risk factors on smoking initiation. Approximately 42% of students had 3 or more risk factors. As the level of risk increased there was a significant increase in smoking initiation in the control group, ranging from 2.7 to 17.2%, $p < 0.001$ (Fig. 1). In the intervention group smoking initiation rates remained stable over the risk index. The results are extensively reported elsewhere [4, 5].

2.4 Conclusions

ASPIRE showed considerable promise in discouraging tobacco-use with options in English and Spanish and is currently disseminated in 23 states across the U.S. The ASPIRE curriculum provides an efficacious computer-based preventive option for schools aimed at smoking prevention.

3 Project CASA (Clean Air—Safe Air)

3.1 Background

Exposure to secondhand tobacco smoke has been causally linked to cancer, respiratory, and cardiovascular diseases, and to adverse effects on the health of infants and children. Second hand smoke (SHS) kills 50,000 nonsmoking Americans from heart disease and lung cancer. A recent

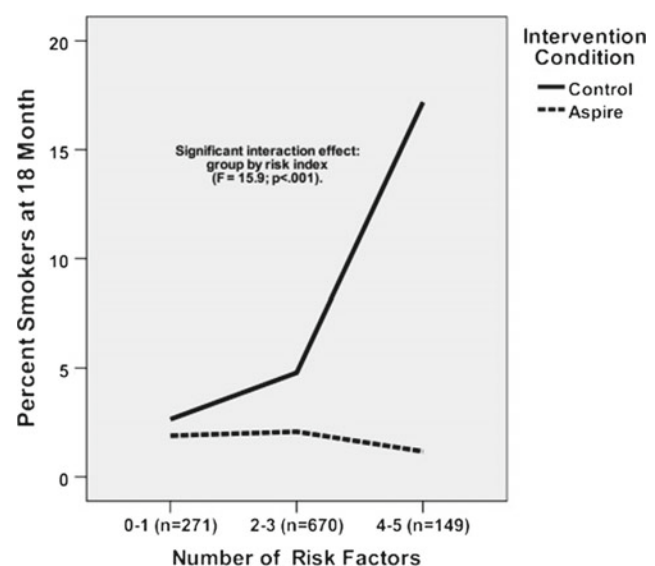


Fig. 1 Smoking initiation by risk score

report by the U.S Surgeon General [5] details the mechanisms by which SHS damages every organ in the body and how cellular damage and tissue inflammation from SHS occur immediately. SHS contains at least 250 toxic chemicals, including more than 50 that can cause cancer. Texas's diverse population is 27% Mexican. Mexican Americans are a high-risk group for developing SHS-related illnesses and have limited access to healthcare [6].

3.2 Methods

The study was a randomized controlled trial nested within a cohort of Houston-area Mexican American households. Ninety-one households were randomized into: (1) Experimental Intervention (EI) where family members received comic books and *fotonovelas* (illustrated storybooks) designed to promote tobacco-free indoor air environments and (2) Standard Care (SC) where family members received an American Cancer Society booklet. Evaluations were done at baseline, 6-month, and 12-month follow-ups. The primary outcome of SHS exposure was based on objective monitoring of SHS using passive diffusion nicotine monitors. Subjectively measured SHS exposure was based on responses on indoor smoking ban provided for each household.

3.3 Results

A total of 74 households provided the baseline as well as 6- and 12-month monitor data. In the high exposure room a significantly higher decrease in the mean ambient level was seen in the EI condition compared to the SC condition (Fig. 2). At baseline all recruited households allowed smoking indoors. At 12 months 70% percent of households in EI and 56% in SC that banned smoking at 12 month. The results from the study are presented in detail elsewhere [7].

3.4 Conclusions

Our culturally relevant intervention has potential to substantially decrease SHS-related health problems in the target households. Results will help in optimizing culturally sensitive interventions and eliminating SHS from Mexican American households.

4 Project Team—A Community-Based Intervention to Enhance Smoking Cessation Counseling Among Physicians and Pharmacists

4.1 Background

Health care providers are well positioned to identify and address tobacco use among patients. Studies have shown that even brief counseling by healthcare providers increases smoking cessation rates [8], yet fewer than 50% of patients who smoke receive cessation counseling during physician office visits [9]. Our objective was to evaluate the impact of a continuing medical education (CME)-accredited training for physicians and continuing education (CE)-accredited training for pharmacists on smoking cessation counseling practices using provider self-reports and patient exit interviews.

4.2 Methods

The study was a nested group-randomized trial using both cross-sectional and cohort repeated measures with commu-

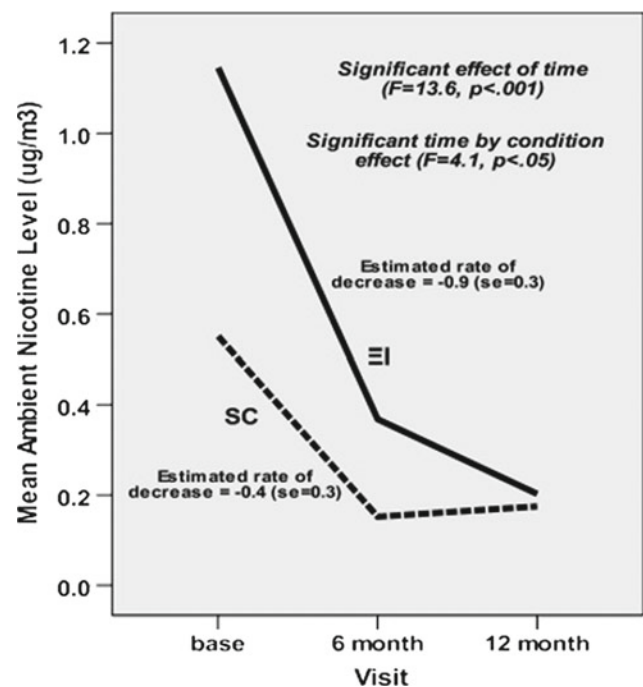


Fig. 2 Mean ambient nicotine level in high exposure room

nity as the unit of randomization. Eighty seven physicians and 83 pharmacists from 16 communities completed pre-training assessments and most completed post-training and extended (6–12 month post-training) assessments. The main outcomes included a composite index measuring providers' ability, confidence and intention to address tobacco use with their patients at pre and post training and long term follow-up and counseling practices using the 5A's of counseling from patient exit interviews at baseline and 12 month follow-up.

4.3 Results

There was a significant increase in the percentage of physicians with a high composite index in intervention from pre to post-training (27–73%, $p < 0.05$) compared to control (27–34%, $p = 0.42$) and for pharmacists (4–30%, $p < 0.05$) compared to control (10–14%, $p = 0.99$). Similar results were seen from pre-training to extended follow-up. For patients counseled by an intervention physician, there was a significant increase in assisting patients to quit (6–36% in the intervention group vs. 19–19% in the control group, $p < 0.05$) from baseline to 12 month. Other counseling practices showed similar trends although group differences were not statistically significant. Patients counseled by pharmacists did not show significant results. The results from this study are presented in detail elsewhere [10].

4.4 Conclusions

Tobacco cessation training of physicians has led to substantial and lasting improvement in patient counseling; thus, this type of training appears to be appropriate and should be broadly disseminated. Discouraging results among pharmacists are attributed not to the existing system not being conducive to implementing the counseling knowledge and skills acquired during the training.

5 Tobacco Control Mobile Apps

5.1 Rationale

Once a health-related research project is complete, one of the challenges is to find a way to successfully disseminate this health information to the general public. Fortunately, the Apple App Store and other mobile app platforms provide a way to disseminate health information to a worldwide audience.

It has been estimated that over 500 million mobile phone users around the world will have used a health-related

mobile app by 2015. By 2018 more than half of the more than 3.4 billion mobile phone and tablet users will have downloaded a mobile health app. These users include patients, health care providers and the general public [11].

The increasing popularity of health-related apps and the successful results of our research studies encouraged us to develop a group of evidence-based mobile apps. These apps include health information and materials that proved to be effective in the previously described projects.

6 Tobacco Free Teens

6.1 Background and Description

A search of the smoking cessation and prevention apps available on the Apple App Store turned up numerous results for apps directed at general users that are trying to quit smoking but few, if any, for users in specific risk categories. For example, we did not find any comprehensive smoking related apps that specifically targeted adolescents.

The results previously described for Project ASPIRE concluded that the developed curriculum for the project discourages tobacco use among adolescents. This result and the success of our web-based ASPIRE program led us to develop a mobile app that is based on the ASPIRE curriculum.

“Tobacco Free Teens” is a smoking cessation and prevention app developed specifically for adolescents and young adults. It contains a variety of illustrated comics and mini-games that will inform and entertain (“edutainment”) it's intended audience. At the start, the user can choose one of four different tracks in order to receive the most relevant information that relates to their current health needs. The app is very comprehensive and touches on all major areas of smoking prevention and cessation.

7 Tobacco Free Family

7.1 Background and Description

Our searches did not find health apps that provided information about the dangers of secondhand smoke. Our Project CASA results indicate that culturally relevant materials are effective in decreasing secondhand smoke related health issues in households. These findings led us to develop a mobile app based on the intervention materials developed for the project.

“Tobacco Free Family” contains informational materials in the form of several illustrated, easy to read stories that provide lessons on the dangers of secondhand smoke to members of a household. The app also contains a mini-game

that introduces the user to important facts about secondhand smoke. Links to smoking resources are included for those interested in quitting smoking. The app is localized for Spanish speakers.

8 QuitMedKit

8.1 Background and Description

In our research of current tobacco cessation and prevention mobile apps, we found no apps that specifically targeted physicians and other health care workers. One of the key results of our Project TEAM study indicates that patients who receive counseling from an intervention physician are more likely to quit than those who do not.

With these results in mind we developed the “QuitMed-Kit” app, an informational app designed to assist physicians and other health care provider’s to counsel their patients on smoking cessation. The user interface is straightforward and easy to navigate. The program provides up-to-date knowledge on behavioral counseling and pharmacological treatments for nicotine dependence in a compact and succinct form. All the information follows the U.S. Department of Health and Human Services Clinical Practice Guidelines [12].

9 Vaper Chase

9.1 Background and Description

One nationally representative sample found that among 18- to 24-year-old cigarette smokers, 37.6% were exclusively cigarette smokers, while 62.4% were also users of other tobacco products (i.e., variants of cigars, smokeless products, hookah, and electronic cigarettes) [13]. Twenty-five percent of a national sample of young adults in 2014 smoked tobacco with a hookah. At 6-month follow-up, an additional 8% of never users initiated hookah [14]. Perceiving a need for up to date information about these new and emerging tobacco products we developed a mobile app.

“Vaper Chase” is a cross-platform app that is compatible with all iOS and Android devices. Its’ educational materials were developed to help inform smokers and non-smokers about the current dangers of e-cigarettes and hookah.

The app was designed as a fun, interactive, mystery-type game where the user is introduced to the health information by interacting with various illustrated characters and by finding hidden objects that are embedded throughout the story locations. There are also short quizzes at the end of

each of the two main sections that reinforce the learning materials.

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Family Mediation in England and Wales: A Focus on Children

Amel Ketani

Abstract

It is said that ‘love is blind’. Love can also grow, develop and possibly lead to a union between two people. However when things go wrong, separation or divorce can become inevitable. It can also be said that the end of the relationship and the separation period can lead to the ‘couple’s deafness’ where the ex-partners refuse to hear each other and only focus at times on how best to hurt each other. In every mediation, the interests and needs of the parties tend to be the focus of the mediator and the participants. However with family mediation, an additional interest and need has to be considered and that is the one that belongs to the children. Also many other participants who are physically absent during the family mediation, such as grandparents and new partners, sometimes have to be included in the overall outcome and agreement of the family mediation. This makes family mediation unique in its complexity and intricacy. This article aims to consider how best to include children’s needs and interests in family mediation. The advantages and disadvantages of child-inclusive mediation will also be considered along with the role of the mediator in this context. This article will demonstrate that family mediators need to be aware of the children’s wishes and concerns and that there are different ways family mediators can approach and implement this.

Keywords

Family mediation • Role of the mediator • Parents’ needs • Children’s interests • Advantages and disadvantages of child-inclusive mediation • Domestic abuse • Models and approaches in mediation

1 Introduction

The definition of child-inclusive practice is to give children the opportunity to have a conversation (verbal, written, through play or storytelling) with the professionals who are assisting their parents to make arrangements for the children’s future. It enables consenting children to share their experiences of parental/family separation and express their concerns and views, and for these to be sensitively considered with their parents so that their developmental needs can be better understood and taken into account within the dispute resolution process. In this article, the following questions will be discussed: what should the role be of a family mediator when trying to include children’s needs and interests in family mediation, how should the mediator deal with domestic abuse and child protection, is the ecosystemic approach the best model to use to include children’s interest and what are the potential benefits and disadvantages of including children in mediation.

2 Family Mediator’s Role in Child-Inclusive Mediation

The consent of both parents is required for the child to be directly involved in family mediation. Parents may have concerns about the emotional impact on their children, while mediators may fear that seeing children directly may undermine and disempower parents, instead of empowering them. It also needs to be borne in mind that a large proportion of disputes between parents over arrangements for their children concern very young children who are too young to be consulted directly. 20% of the children in private law cases in a study conducted for the Ministry of Justice [1] were under two years old and a further 18% were under four years old. Three quarters of the children (76%) in contested family proceedings were under ten years old [1]. The emotional maturity of a child is not congruent with their chronological

A. Ketani (✉)
BPP University, London, UK
e-mail: Amelketani@bpp.com

age and when children are not only of an age but mature enough and willing to be involved directly, calls to Childline indicate that they are perfectly able to enter into discussions about the future, so long as they are not being asked to choose in an atmosphere of acute conflict where they feel caught in the middle ... These calls are a very persuasive argument in favour of a family mediation service which includes children ... an outside person to help everybody talk ... could be of considerable help to children, as well as to parents, in managing the feelings that threaten to overwhelm them.

Moreover studies of child-inclusive mediation in Australia, Canada and New Zealand [2] suggest significant benefits for children and their parents, provided there is careful planning with both parents and agreement as to the objectives, conditions and manner of including the child. Family mediators need to make sure that pre-conditions for involving the child can be met and parents need to understand and agree the conditions, timing and nature of any direct child involvement [3]. Pre-requisites include the suitability of child-inclusive mediation in the circumstances, clarity about the role of the family mediator or other professional who will meet with the child, the principles and limits of confidentiality (a) for parents and (b) for the child, before, during and following a meeting with the child, and the need to seek the child's informed consent. Family mediators should follow guidelines covering these pre-requisites and parents must give written agreement to the terms of the child's involvement. Mediation in Divorce (MID) provides a range of services for adults and children—child-centred and child-inclusive mediation, adult and child counselling and the Family Bridges Project [4]. MID routinely invites young people to come in for a conversation about family changes and arrangements.

Following the analysis above, it can be argued that the family mediator's role can be a catalyst in facilitating better child-parent communication. It should not be in any way directive or controlling. Sensitive interventions by mediators can help parents to work out practical arrangements and consider how to help their children adjust, while also enabling children and young people to feel that their views matter too and that their parents are taking them into account. Family mediators may draw on their understanding of attachment and systems theory, family interactions and communications. All these are relevant to mediating with parents, children, young people and other family members. Mediators who take part in helpful and supportive conversations with a child or young person can reassure the child that their feelings about what is happening in their family are normal and understandable, without the child feeling interrogated or put under pressure [5].

Due to the above complexities surrounding child-inclusive mediation, it is essential to discuss child protection in domestic abuse cases.

3 Associations Between Domestic Abuse and Child Protection

Another challenging area faced by family mediators involves protecting children who witness domestic abuse. It is hence important to argue that screening by family mediators for domestic abuse and/or child abuse is not a substitute for child welfare investigations. This is because mediators may encounter situations of children at risk that have not been reported to a safeguarding agency and which need to be reported. To understand this argument, it is necessary to consider some facts involving children and domestic abuse.

Indeed children are liable to have suffered physical abuse themselves in as many as 40–60% of domestic violence cases [6]. 750,000 children annually are reported to have witnessed domestic violence and in 90% of incidents, children were in the same or an adjoining room [7]. Children have described their terror of the violence they could hear taking place: 'I used to hide myself in the smallest part of my bedroom' [8]. The impact on children of witnessing or experiencing violence and fearing further violence may be devastating and in the longer term, it may have deeply damaging effects. Domestic violence features in the lives of 37% of children who are receiving social work interventions and 60% of those on the child protection register.

English law recognises that a child witnessing or hearing domestic abuse is a child protection issue. The meaning of harm to a child was amended in the Adoption and Children Act 2002 to include 'impairment suffered through seeing or hearing the ill treatment of another'. Hence it appears to be that when there is domestic abuse, questions need to be asked about child abuse and when there is child abuse, questions need to be asked about domestic abuse. Many children remain in contact after separation with an allegedly abusive parent and some continue to live with one. Contact between parents when collecting or returning children may be a flashpoint when further abuse occurs.

Having considered some of the complexities that family mediators face in protecting children's needs, it is necessary to examine how best to incorporate children's interests in family mediation.

4 Incorporation of Children's Interests in Family Mediation

Much of the literature on different approaches to mediation (structured, transformative and narrative)—focuses on adult perspectives and adult needs. Children are scarcely mentioned. The words 'child' and 'family' do not feature in the index to 'The Promise of Mediation'. Even where there are child-related issues, children may be regarded as objects of competition or care, rather than as the subject of rights who

need a voice in decision-making. The aim of this article is not to consider the different approaches to mediation mentioned above but to question whether the ecosystemic family mediation is a better way of incorporating children's interests.

An ecosystemic approach is an approach to therapy emphasising the interaction between a person, or family and a larger social context as well. In other words, the ecosystemic family mediation addresses the needs of individuals and families as they navigate their way through major changes in relationships and living arrangements. According to Parkinson and in this context, connections/links need to be made between a number of elements. The links are as follows:

- Links between the private family system and public systems of family justice and child protection.
- Family systems including children and parents, former partners and new partners, step-parents and members of extended families—not only separating and divorcing couples [9].

Ecosystemic mediation makes connections between private family processes and public systems, including the legal system, employment and economic systems and social support services for families. In a sense, mediators mediate between the private system of family decision-making and public systems of justice and child protection. Mediators work at the interface between these systems, assisting family members to communicate and collaborate more effectively and thus avoid the unnecessary involvement of public systems. When the judicial system needs to be involved—for example, when a court order is needed to give legal force to a divorce settlement or in child welfare mediation, the mediator can facilitate a smooth conjunction, so that the cogs of different wheels can turn without one set of wheels impeding the other. Those who work in the family justice system need to understand the complementary roles and responsibilities of judges, legal advisers, social workers and mediators. Mediators need to understand the boundaries between these roles and the ways in which systems function and interact with each other [9].

An understanding of the impact of the legal, economic, political, social, gender, cultural, ethnic, family and psychological environment of any dispute between individuals, particularly one involving children, is fundamental to the discussions that occur in mediation. If negotiations take place in mediation without reference to influences and consequences outside mediation, power imbalances may be accentuated. The changes involved in moving from a two-parent household to two single-parent households—or to family arrangements involving new partners and children

from other relationships—require multiple adjustments, for adults and for children.

It is plausible to think that there are many dimensions in which adjustments need to be made—emotional, psychological, legal, economic and social. These dimensions need to be understood and addressed in considering the needs of each partner and their children. A solution that one partner might seek for emotional reasons—such as remaining in the family home—needs to take account of the needs of all concerned, as well as being viable financially. Each family's culture, needs, circumstances and relationships are unique. It appears to be that arrangements need to be designed by family members, rather than imposed on them, so that they will work in the longer term and not just settle a dispute in the short term.

It can also be argued that ecosystemic family mediation encourages parents to consider their children's perspectives and needs in maintaining relationships that nurture and support children. The definition of 'family' as a biologically related group consisting primarily of two parents and their children—the traditional nuclear family—is largely obsolete. Many families blend different cultures and traditions within infinite varieties of living patterns and child-rearing arrangements.

Enabling children to maintain their attachments to both parents and to others they love—grandparents, aunts, uncles, close friends—may be crucial for their well-being and psychological security. A research study [10] with children aged between eight and fourteen found that from the children's perspectives, the key defining characteristics of 'family' were love, care, mutual support and respect. Children shared this concept of 'family' irrespective of differences in their gender, ethnic background and where they lived. Older children were less likely than younger ones to define family in terms of formal relationships and more likely to see the nature or quality of relationships as the defining feature.

It is plausible to think that if the dispute is viewed in a systemic frame, it may be evident that the reactions and actions of each family member, including children, influence the actions and reactions of other family members in a reciprocal way. Therefore, to work solely with the adults involved, without taking account of the needs, feelings and reactions of their children, may be ineffective in resolving disputes. Children can block arrangements with which they are profoundly unhappy. As ecosystemic mediation focuses on the family as a whole, children and other family members are included in this frame, indirectly and directly. The mediator maintains equidistance by helping participants to consider the needs of the family, rather than focusing solely on the dyad of two conflicted parents. Children and young people need opportunities to have a say and be listened to in working out arrangements that affect them.

Finally it seems to be that family mediators are presented with complex relationships in dramatically—often traumatically—changing family structures. In practical terms, childcare is often an issue for parents in stable relationships trying to juggle family and work commitments. Many couples who co-parented their children when they lived together continue to co-parent after they separate. Other separated couples do their parenting in parallel, rather than jointly. It can be argued that parallel parenting needs basic understandings between parents who may have different approaches to discipline and routine and may not communicate readily with each other, except over essentials. Parallel parenting with little communication between the parents may burden children who are used as messengers. As analysed above, the ecosystemic mediation approach appears to be the best solution so far when children are involved.

Having considered the best way to incorporate children in family mediation, it is important to consider in the following paragraphs the disadvantages and advantages of including children in family mediation.

5 Possible Disadvantages of Including Children in Mediation

Possible disadvantages of including children in mediation were highlighted by Cantwell [11] in the following way:

- Involving children increases their distress and confusion
- Children will be upset if they become more aware of parental conflict.
- Children do not share legal responsibility with their parents. Their parents hold responsibility for them and children should not be drawn into parental disputes.
- Children should not be used as judges or arbitrators in parental negotiations.
- Power imbalances between parents and children lie outside the boundaries of mediation.
- Empowering children risks ‘disempowering’ one or both parents.
- Parents’ decision-making authority is undermined if the child or the mediator is seen as the expert.
- The mediator’s role may be confused with the role of counsellor or child advocate.
- Involving children may create expectations that things will be made better for them.
- Children may feel under pressure to express their views and feelings.
- Children may fear being asked to make a choice.

- Children may not be reliable judges of their long-term interests.
- The mediator may become triangulated between parents and child.
- The mediator could be left holding secrets or confidences from a child that the child does not want shared with parents: this would be an untenable position for the mediator.
- The child’s conflicts of loyalty may be heightened.
- Parents may be unable to manage their distress in front of the children.
- Parents may brief the child on what to say and put pressure on the child.
- Parents who are unable to co-operate do not necessarily gain this ability through hearing what their child says: they may refuse to take the child’s views and wishes on board.
- Feedback to parents afterwards may result in them being angry with the child or interrogating the child.
- Young children who see their parents talking in a friendly way may think their parents are going to get back together again—feeding hopes of reconciliation.

6 Potential Benefits of Including Children in Mediation

Possible advantages of including children in mediation were highlighted by Parkinson [9] as follows:

- Research comparing child-focused mediation with child-inclusive mediation indicates that child-inclusive mediation offers significant additional benefits in terms of positive relationships and agreements being maintained, with positive feedback from children [2].
- Children need explanations and reassurance that their parents may have been unable to give them.
- Children adjust more easily if there is better communication and they understand their parents’ decisions more clearly.
- Involving children shows them that their wishes, views and feelings matter and that they are being treated with respect.
- Listening to children is a way of showing care.
- Involving children in mediation helps both parents to listen to their children.
- Parents may choose to explain their decisions and arrangements to their children in family meeting (some parents need the mediator’s support to do this).

- Dispelling misunderstandings: for example that a child does not want to see a parent when the child actually wants to do so.
- Enabling children to ask questions, comment and contribute their ideas.
- Enabling children to express a worry or concern, such as where the family's pets will live.
- Easing communication and reducing tensions in parent-child relationships.
- Giving children an opportunity to see the mediator alone and talk about their feelings and concerns, without being anxious about how the parents will hear them.

Following the above analysis on the advantages and disadvantages of child-inclusive mediation, it can be argued on one hand that allowing the voice of the child into the mediation process acknowledges the worth of the child and alleviates distress. Child-inclusive mediation can assist children work out the messages they may want to give to their parents (or other people involved) and to feel able to give these messages. It can also enable a child to receive a message from a parent who cannot give it directly, for some reason and with the child's agreement, giving feedback to parents to help them understand the child's concerns and feelings, so that these can be taken into account in the parents' decisions. However on the other hand, it can be argued that post-divorce adjustment of children depends on the interaction of a number of variables, including the quality of the relationships, the quality of the parental care, the child's environment and the wider family dynamics. It would hardly be realistic to expect that the truncated intervention of mediation would make substantial and permanent changes in the lives of children, particularly where the children do not participate. Nonetheless this should not undermine the potential of family mediation as a tool for parents who choose to co-parent after divorce, or the beneficial effects of parental co-operation for the children.

7 Conclusion

In conclusion, it is plausible to think that involving children in mediation can help them to feel clearer and more confident about what they want to say to their parents, as well as what they need to hear from their parents. However, it appears to be that there are occasions when the child wants help to explain something to their parents. Even a limited agreement on a small step may be valuable in helping

parents and children to talk and listen to each other. It is equally important to give explanations that are appropriate to their age and to convey reassuring messages, especially when communication between a child and a parent has broken down. The feelings and views children may express—or be unable to express—depend on the child's perceptions. These perceptions are liable to change as they gain a better understanding of their parents' positions and feelings. It can be argued that the main benefit of involving children directly is to re-open channels of communication between the child and both parents, so that they can listen and hear each other with more empathy and understanding.

Finally it can be said that when family mediators are positive about the benefits of including children, they are more likely to be able to reassure anxious parents. However, one can be struck by the number of trained and accredited family mediators who indicated that they do not consider themselves ready to embrace true child-inclusive practice and by the many mediators who commented that the existing training is simply not sufficient. It hence seems to be that a competency-based approach should underpin future training for child-inclusive mediation, and this training should reflect the change in culture (with respect to the mediator's former approach and training), skills and approach required. The adoption of a whole family approach in dispute resolution means that practitioners have to acquire additional knowledge and skills and demonstrate additional competencies [9].

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Forecasting of the Internet Usage in the World Regions

Ksenija Dumičić[✉] and Berislav Žmuk[✉]

Abstract

The paper focuses fitting of different forecasting methods based on annual time series data for the Percentage of individuals, aged between 16 and 74 years, using the Internet, for eight World regions. For comparison, European Union and the World are used, too. For the 2017 and 2020 forecasts, seven forecasting models were applied: three naïve models, geometric mean, simple average, linear trend and exponential trend model. The minimum mean squared error (MSE) indicated the best fitting forecast model for each of the regions. Forecasting models based on the historic data period from 1996 to 2015 indicate the new ranking of the World regions regarding the Percentage of individuals using the Internet in the near future, e.g., an increase of Percentage of individuals using the Internet in Arab World from 0.04% in 1996 to 40% in 2015, with the forecast of 60% in 2020, fixes this region at the last rank among considered eight regions, but North America, with an increase from 15% in 1996 to 76% in 2015, with the best fitted forecast of 83% in 2020, moves from the first rank in 1996 to the third rank in 2020, after Europe & Central Asia and Latin America & Caribbean. If the forecasts for the observed indicator would be based on a shorter past time series, from 2006 to 2015, in 2020 a different ranking of the World regions would appear.

Keywords

Percentage of individuals using the internet • Forecasting models • Mean squared error • World regions

K. Dumičić (✉) · B. Žmuk
Faculty of Economics and Business, University of Zagreb,
Trg J. F. Kennedyja 6, HR-10000 Zagreb, Croatia
e-mail: kdumicic@efzg.hr

B. Žmuk
e-mail: bzmuk@efzg.hr

1 Introduction

The Internet and digital technologies are transforming the lives we live, the way we work as individuals, in enterprises and institutions, and in our society as they become more incorporated across economy sectors and all strata of the society. The world economy is rapidly converting to be digital. Information and Communications Technology (ICT) is the basis of all modern advanced economic systems. This speed brings enormous possibilities and chances for growth and new jobs. In Marston et al. [1] the World regions are put in a global context presenting a strong global reaction and an importance on recent actions, with examples of mutually dependent development, regional and social inequality. The regions are the outcomes of the two factors: globalization and regionalization. The Internet practice plays an important part in connections that drive unique regional progressions, making regions, as a result, so different when compared to each other.

According to the article given by OECD [2], Southeast Asia, as one of the most dynamic regions in the world, with an increasingly diversified economy, is well positioned to hold the ongoing global digital transformation. Digitalization can support the much needed innovation and productivity growth across many economic activities, and improve well-being. For Southeast Asia, it can help to rise the value-chain and enable movement of regional economies toward growth driven more by productivity increases than by the size of exports. However challenges persist in guaranteeing that all individuals, businesses and governments have consistent and low-cost access to digital networks and services. Wide differences still exist, both within and between ASEAN member states, with the access to digital networks remaining very high in some countries. There is also a digital divide between rural and urban areas, and also between firms of different size regarding the internet use. The probable benefits of the digital transformation go

together with challenges to public institutions, individuals' skills and jobs, to data privacy and data security, as well.

The paper elaborates shortly the literature review regarding Internet usage, taken generally and especially over the World regions, mostly using secondary data sources as the reports and databases given by different global official statistical data stakeholders and suppliers. Also, the paper, presents the originally get forecasting results for the indicator called Percentage of Internet users (among all individuals, aged between 16 and 74 years, who used Internet at least once within the three months prior to the survey date) based on applications of various forecasting techniques and models. Fitting of different forecasting methods based on two different lengths of annual time series ($n = 20$ and $n = 10$) for the Percentage of individuals using the Internet has been considered for eight World regions as follows: Arab World, East Asia & Pacific, Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa, North America, South Asia and Sub-Saharan Africa. For comparison, European Union and the World are used, too. The forecasts for 2017 and 2020 were considered and evaluated, especially because they resulted with different rankings of the regions for the time horizons considered.

2 Literature Review

After European Commission [3], all EU Member States are facing similar problems but on a national basis which is too limited to allow them to seize all the opportunities and deal with all the challenges of this transformational change. The European Commission has set the creation of a Digital Single Market as one of its key priorities. Individuals and businesses can easily access and exercise Internet in environment equally. There is a high level of both consumer protection, and personal data protection, as well. The nationality or place of residence may be neglected.

European Commission's Digital Single Market [4] in the Chapter for Use of Internet and Online Activities reports and analyse the trends of internet use, as well as external reviews and reports ordered by the European countries. The use of Internet is the third of five dimensions of the overall index called the Digital Economy and Society Index (DESI), which is calculated as the weighted average of the five main DESI dimensions: Connectivity (with the weight of 25%), Human Capital (25%), Use of Internet (15%), Integration of Digital Technology (20%) and, as the last, Digital Public Services (with the weight 15%). European Union (EU) Member States in digital competitiveness, European Commission [5]. The use of Internet influence the DESI with the following three components: Content, Communication and Transactions on line, compare to European Commission

[4] Digital Single Market. According to European Commission [6] Europe's Digital Progress Report 2017 on the use of internet services by citizens in the EU 2017 and ePrivacy, people in the EU are occupied in a many of internet activities: they communicate, consume content, shop, use online banking services etc. Such activities are gathered in the DESI dimension 3, on internet use. Denmark, Sweden and Luxemburg have the most active internet users, followed by the Netherlands, Finland and Estonia. Romania, Italy and Bulgaria are the least active. Growth in the use of online services in the EU is generally slow, with a significant increases in ordering goods and services online, especially for internet banking with almost 60% of EU Internet users (aged 16–74) that are online banking users in 2017. Recently, Internet use in the EU has gone mobile, up to 59% in average in 2017.

European Commission [7] in The 2014 Predict Report: An Analysis of ICT R&D in the EU and Beyond reports that the United States (US) was the ICT productivity leader increasing the size of its ICT sector in terms of Value Added (VA) in 2011. Nevertheless, it is being challenged in terms of ICT R&D expenditure in the business sector (BERD) by four Asian countries: Japan, China, Korea and Taiwan according to the following indicators. First indicator is the US lost weight in the ICT Business Enterprise Expenditure on R&D (ICT BERD) world share between 2010 and 2011 whereas the Asian countries increased their positions. Second, the US BERD intensity and ICT BERD intensity (ICT BERD/ICT VA) retained unchanged while it increased in the four mentioned countries. The importance of the ICT sector is very uneven among the countries under consideration. Thus, in 2011 Japan, China, Korea and Taiwan, together represented 81.25% of total ICT VA produced by the thirteen countries selected for analysis in Asia.

European Commission DG Communications Networks, Content & Technology [8] prepared Monitoring the Digital Economy & Society 2016–2021, the report on growth of the ICT sector with predictions on ICT issues given up to 2021. For this purpose, according to the European Commission [9] ICT Industry Analysis: Predict Project Prospective Insights on R&D in ICT (PREDICT 2015 REPORT: An Analysis of ICT R&D—EU & beyond), the following headline indicators should be measured and collected: Share of the ICT sector in the economy measured as a proportion of GDP and of total employment; Growth of the ICT sector measured as a percentage change of VA at current prices and expressed in Purchasing Power Standard; Ratio of the productivity level in the ICT sector with respect to the entire economy; Productivity growth in the ICT sector; Size and nominal growth of ICT markets; Import and export of ICT goods and services; Demography of enterprises in the ICT sector; R&D expenditure by the ICT sector as a % of GDP; R&D

expenditure by the ICT sector as a % of total R&D expenditure in the business sector (BERD); and R&D expenditure by the ICT sector as a % of the VA (of the ICT Sector).

3 Data and Methods

The main variable under study is the development indicator named the Percentage of individuals using the Internet (percentage taken of all individuals, aged between 16 and 74 years, who used the internet at least once within the three months prior to the survey date) [10]. Internet users are individuals who have used the Internet (from any location) in the last 3 months. The Internet can be used via a computer, mobile phone, personal digital. The percentages are calculated as a share of total population of eight regions, covering the countries of the World, as follows: Arab World (ARB), East Asia & Pacific (EAS), Europe & Central Asia (ECS), Latin America & Caribbean (LCN), Middle East & North Africa (MEA), North America (NAC), South Asia (SAS) and Sub-Saharan Africa (SSF). For comparison, European Union (EUU) and the World (WLD) are used.

Data for the Percentage of individuals using the Internet are taken from the World Bank database [11]. In the analysis annual data from 1996 to 2015 are used. In the first step descriptive statistics analysis will be conducted. Afterwards, forecasting analysis will be applied. Due to usage of yearly data and rather short time series of only 20 years, in the forecasting analysis basic forecasting models are going to be taken into account. According to Makridakis, Wheelwright, Hyndman [12], the following seven forecasting models are considered to be used in the analysis: naïve model I (status quo model), naïve model II (status quo differences model), naïve model IIa (status quo change rates model), geometric mean forecasting model, simple average (arithmetic mean) forecasting model, trend polynomial of the first degree

(linear trend) model, and exponential trend polynomial of the first degree (exponential trend) model. The selection of the most appropriate forecasting model has been made by using the mean squared error (MSE) criteria. In other words, the forecasting model with the lowest MSE value has been used to perform forecasts for each group of countries separately.

The forecasting analysis will be made by observing the whole period from 1996 to 2015, but forecasts based on the values from 2006 to 2015 are going to be calculated also. The main reason for making two analyses it can be found in the fact that the main variable can take values in limited interval from zero to 100. Furthermore, it will be interesting to compare the results from those two analyses approaches.

The selected forecasting models are going to be used to calculate forecasts for two and five periods in advance. Consequently, forecast values of variable Percentage of individuals using the Internet for years 2017 and 2020 will be estimated, and new ranking of the World regions regarding this variable will be recognized and discussed.

4 Descriptive Statistics Analysis

In Tables 1 and 2 basic descriptive statistics results for variable Percentage of individuals using the Internet in the observed groups of countries are given. The main difference between these two tables is in the length of the observed period. In Table 1 values of variable Percentage of individuals using the Internet are observed in period from 1996 to 2015, whereas in Table 2 the observed period is from 2006 to 2015.

According to Table 1 convincingly the lowest average of variable Percentage of individuals using the Internet is present at countries from South Asia and from Sub-Saharan Africa. If median values of variable Percentage of

Table 1 Basic descriptive statistics results for the variable Percentage of individuals using the Internet, for the period from 1996 to 2015 (n = 20)

Country group	Country group code	Average	Standard deviation	Coefficient of variation	Median	Min	Max
Arab World	ARB	14.04	13.56	96.56	10.02	0.04	39.95
East Asia & Pacific	EAS	20.57	16.60	80.70	15.64	0.46	49.59
Europe & Central Asia	ECS	36.68	23.37	63.72	36.65	1.84	71.13
Latin America & Caribbean	LCN	21.69	17.94	82.68	18.69	0.31	54.65
Middle East & North Africa	MEA	15.11	14.39	95.27	10.77	0.08	44.31
North America	NAC	59.13	19.53	33.03	68.80	15.47	75.85
South Asia	SAS	5.55	6.75	121.65	2.77	0.04	23.63
Sub-Saharan Africa	SSF	6.11	7.25	118.68	2.49	0.07	22.39
European Union	EUU	47.34	26.41	55.78	52.76	2.81	79.55
World	WLD	19.19	13.55	70.60	16.70	1.33	43.90

Table 2 Basic descriptive statistics results for the variable Percentage of individuals using the Internet, for the period from 2006 to 2015 (n = 10)

Country group	Country group code	Average	Standard deviation	Coefficient of variation	Median	Min	Max
Arab World	ARB	25.53	9.25	36.24	25.54	11.65	39.95
East Asia & Pacific	EAS	34.49	11.23	32.56	35.80	16.62	49.59
Europe & Central Asia	ECS	56.51	11.33	20.06	57.48	38.08	71.13
Latin America & Caribbean	LCN	36.89	11.41	30.93	37.03	20.75	54.65
Middle East & North Africa	MEA	26.97	10.62	39.37	26.27	11.79	44.31
North America	NAC	73.25	2.11	2.88	73.55	69.27	75.85
South Asia	SAS	10.13	6.96	68.73	8.30	2.98	23.63
Sub-Saharan Africa	SSF	11.47	6.82	59.46	10.94	2.93	22.39
European Union	EUU	69.53	8.00	11.51	71.07	54.55	79.55
World	WLD	30.49	8.78	28.79	30.44	17.60	43.90

individuals using the Internet are observed, the difference between the countries from South Asia and from Sub-Saharan Africa and other groups of countries seems to be even larger. Finally, the maximum values, which actually represent the values for each group of countries from the last 2015 year, show that countries from South Asia and from Sub-Saharan Africa fall considerably much back in compare to the other groups of countries.

On the other side, countries from North America seem to have the highest average of variable Percentage of individuals using the Internet among the observed groups of countries. However, this situation can be explained by far the highest starting position of North America in compare to the other groups of countries. So, in countries of North America 15.47% of individuals used Internet in 1996 whereas this percentage in other groups of countries was way below 3%. Still, if the maximum values or values from 2015 are observed, it can be concluded that countries from Europe & Central Asia and the European Union have reached Percentage of individuals using the Internet level of North America.

The standard deviations and coefficients of variation from Table 1 reveal the presence of quite remarkable changes of Percentage of individuals using the Internet values during the period from 1996 to 2015 for the countries within the regions. These effects are more evident when Fig. 1 is observed.

In Fig. 1, each of the World regions, as a group of countries has been separately shown. However, for comparison purposes, two lines, for the European Union and for the whole World, have been added to graph for each of the regions.

If the ranks of the observed groups of countries according to the variable Percentage of individuals using the Internet value are observed, it can be concluded that real changes are not obvious. During the whole observed period, from 1996 to 2015, countries from North America are ranked on the 1st

place whereas countries from Europe & Central Asia are on the 2nd place. Countries from Latin America & Caribbean and countries from East Asia & Pacific switched places in 2003. Before 2003 countries from Latin America & Caribbean were placed 4th, now 3rd, whereas countries from East Asia & Pacific Caribbean were placed 3rd but now are on the 4th place. Countries from Middle East & North Africa kept their 5th place in the observed period. Countries from Arab World took 6th place in 1997 and kept it until today. Countries from South Asia and countries from Sub-Saharan Africa are changing their, last, positions in the observed period. So, countries from South Asia were on the 8th, last, place in periods from 1997 to 2000 and from 2008 to 2014 whereas countries from Sub-Saharan Africa were on the last place in period from 2001 to 2007. On the 7th place countries from South Asia can be found in 2015 whereas countries from Sub-Saharan Africa fall again to the last place in the same year.

According to Fig. 1, the most of the World regions have strong positive increase in initial years whereas this increase weakens in following years. Because of that the decision that the values of variable Percentage of individuals using the Internet will be observed in shortened period is confirmed as a good one. In Table 2 basic descriptive statistics results for shortened period, from 2006 to 2015, are shown.

After the observed period is shortened from the period 1996–2015 (n = 29) to 2006–2015 (n = 10), the values of standard deviation and coefficient of variation measures, as given in Table 2, got considerably smaller values. Accordingly, it may be concluded that the variability of the distribution of Percentage of individuals using the Internet values over the countries within the regions in the period from 2006 to 2015 are much smaller than in the previous years, between 1996 and 2006.

Figure 2 shows the Percentage of individuals using the Internet for the respective region compared to the EUU and WLD for the period from 2006 to 2015 are shown.

Fig. 1 Percentage of individuals using the Internet for the observed World regions compared to the EUU and the whole World for the period from 1996 to 2015 (n = 20)

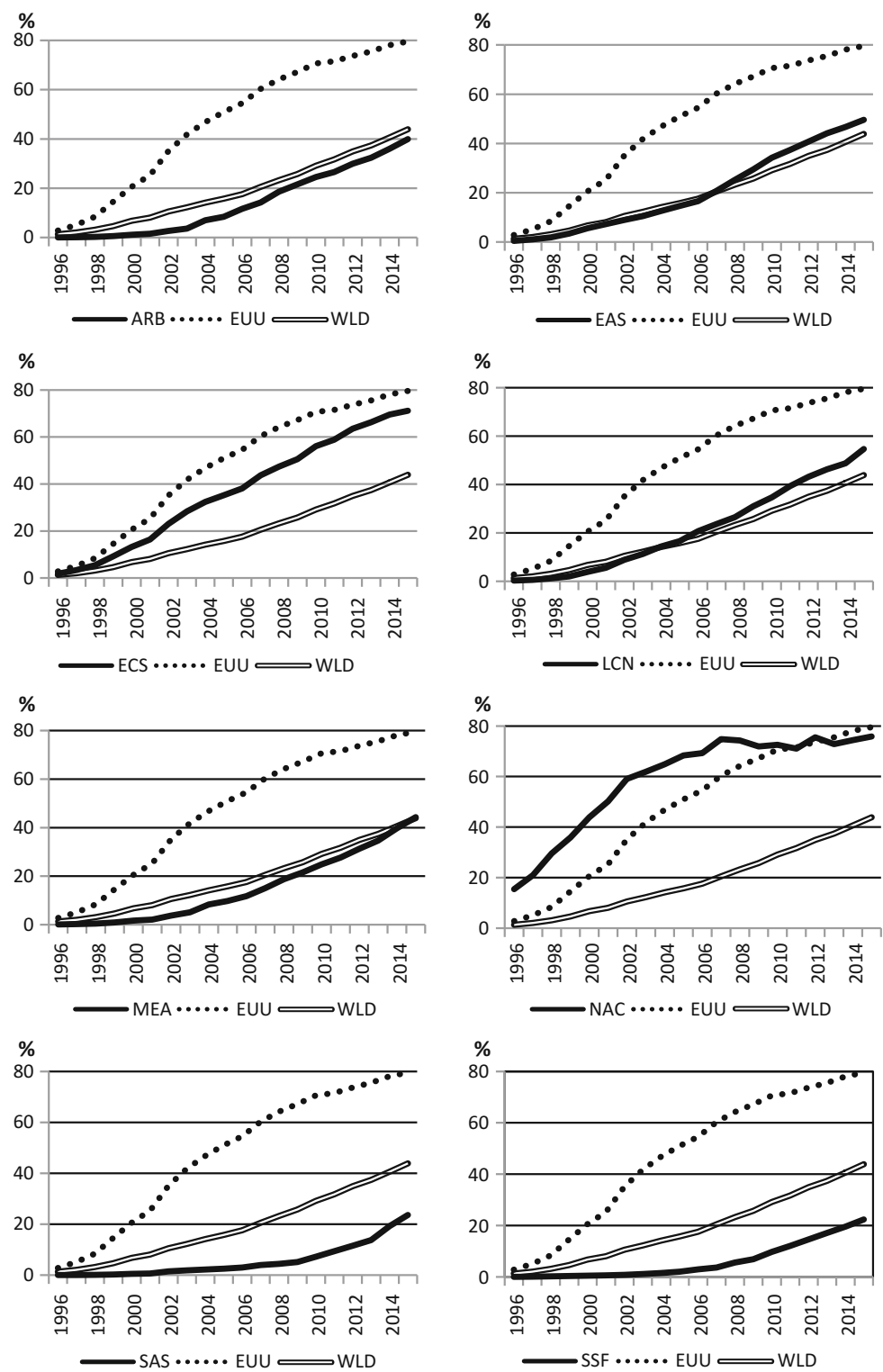
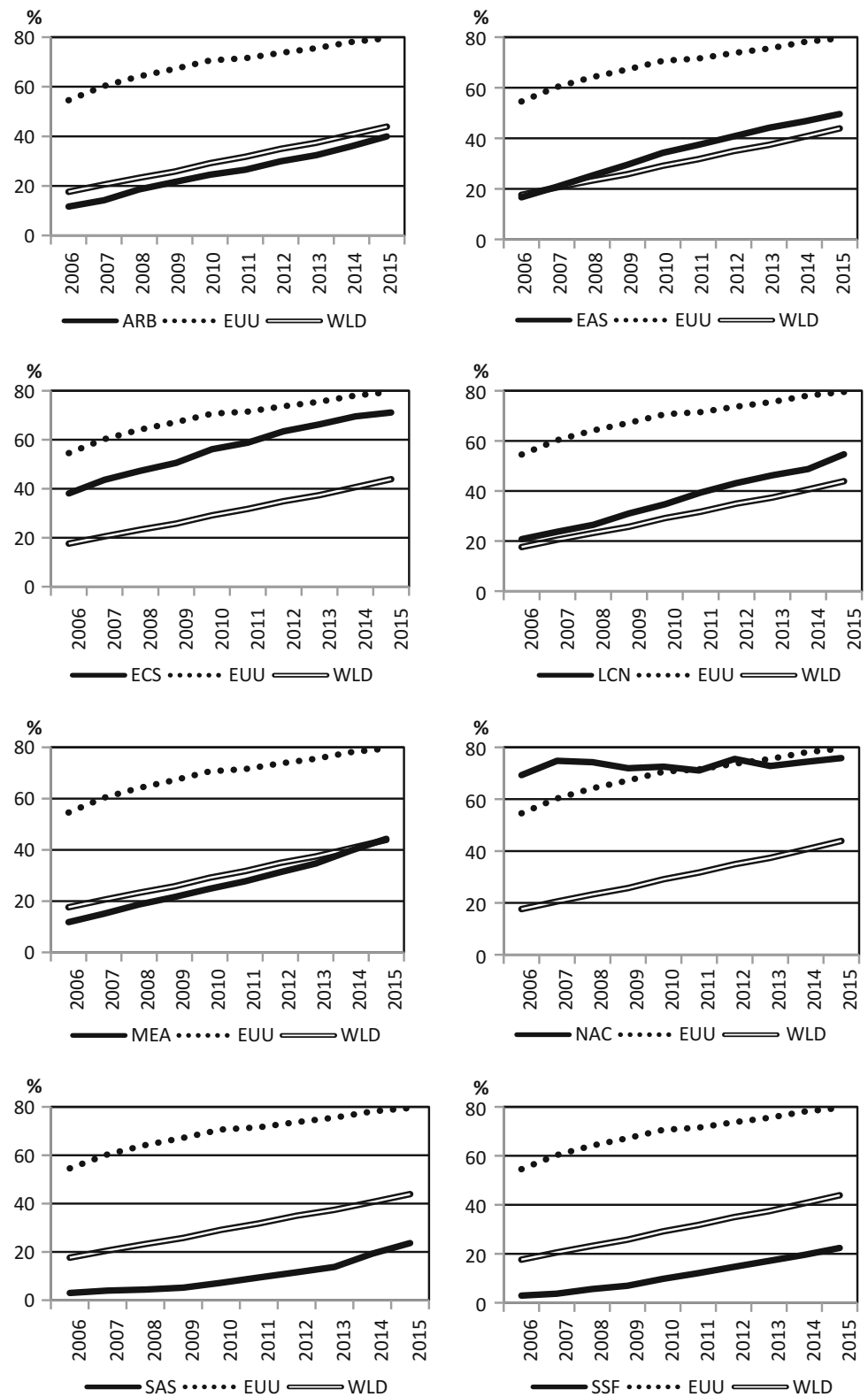


Figure 2 is organized on the same way as Fig. 1. Accordingly, percentage of individuals using the Internet can be easily compared between different regions and according to benchmarks (the European Union and the World level) in the shorter period, from 2006 to 2015.

Figure 2 reveals that the observed regions according to Percentage of individuals using the Internet variable values and changes in time can be divided into three groups. In the first group, the group with the smallest Percentage of individuals using the Internet variable values, South Asia and

Fig. 2 Percentage of individuals using the Internet for the observed World regions compared to EUU and the whole World for the period from 2006 to 2015 (n = 10)



Sub-Saharan Africa are placed, whereas in the second group, the group with the highest Percentage of individuals using the Internet variable values, can be placed countries from

Europe & Central Asia and North America. All other groups of countries can be placed in the group with medium level Percentage of individuals using the Internet variable values.

5 Forecasting Analysis

In order to forecast the Percentage of individuals using the Internet, as the variable of the research interest, for the observed groups of countries altogether seven different forecasting models have been considered: firstly, based on annual data from 1996 to 2015 (with $n = 20$), and secondly, based on annual data from 1996 to 2015 (with $n = 10$). The most appropriate forecasting model was selected by observing mean squared errors at each of the seven different forecasting models. Finally, the forecasting model with the lowest mean squared error was chosen and forecasts for 2017 and 2020 have been calculated.

5.1 Forecasting Methods Applied on Time Series Annual Data from 1996 to 2015 (N = 20)

The results of applied forecasting procedures that are based on $n = 20$ annual data, from 1996 to 2015, and for the time horizons of $\tau = 2$ (for the year 2017) and $\tau = 5$ (for the year 2020), are shown in Table 3.

According to Table 3, naïve model II has shown to be the most appropriate to forecast the variable Percentage of individuals using the Internet based on the 20-years historic period. Only at countries from Europe & Central Asia linear trend model proved to be the best choice. As expected, due to large data dispersion the highest mean squared error was measured at countries from North America.

All the applied forecasting methods suggest that the indicator Percentage of individuals using the Internet should continue to increase in the further years in all observed groups of countries. However, this increase is not the same at all groups of countries. Consequently, the rank of groups

of countries are expected to change in the future. According to calculated forecasts, countries from Europe & Central Asia are going to have the highest Percentage of individuals using the Internet value by 2020. Countries from Latin America & Caribbean and from Middle East & North Africa are forecasted to increase their rank whereas countries from North America and from East Asia & Pacific are forecasted to achieve lower ranks than in 2015. Three the worst ranked groups of countries are going to stay on their positions.

5.2 Forecasting Methods Applied on Time Series Annual Data from 2006 to 2015 (N = 10)

The results of applied forecasting procedures that are based on $n = 10$ annual data, from 2006 to 2015, and for the time horizons of $\tau = 2$ (for the year 2017) and $\tau = 5$ (for the year 2020), are shown in Table 4.

In Table 4 selected forecasting models based on the shorter time series data, from 2006 to 2015, with $n = 10$, are shown. Unlike earlier, here exponential trend model has shown to be the most appropriate choice, according to the lowest mean squared error criteria, at two groups of countries. Nevertheless, all selected forecasting models suggest that Percentage of individuals using the Internet should continue to raise in the following years. However, the lowest increase is forecasted at countries from North America whereas the highest increase is recorded at countries from South Asia. Consequently, on that way a great potential of countries from South Asia has been revealing. The calculated forecasts are graphically shown in Fig. 3.

Figure 3 shows the actual and forecasted values of the variable Percentage of individuals using the Internet for the observed groups of countries with included benchmarks (the

Table 3 Selected forecasting models and forecasts for 2017 and 2020, for the variable Percentage of individuals using the Internet, based on historic data from 1996 to 2015 ($n = 20$)

Country group code	Selected forecasting model	Mean squared error	2015		2017 ($\tau = 2$)		2020 ($\tau = 5$)	
			Actual	Rank	Forecast	Rank	Forecast	Rank
ARB	Naïve model II	1.41	40	6	48	6	60	6
EAS	Naïve model II	0.57	50	4	55	4	64	5
ECS	Linear trend model	2.20	71	2	82	1	94	1
LCN	Naïve model II	1.55	55	3	66	3	84	2
MEA	Naïve model II	0.85	44	5	54	5	67	4
NAC	Naïve model II	13.94	76	1	79	2	83	3
SAS	Naïve model II	0.84	24	7	32	7	45	7
SSF	Naïve model II	0.27	22	8	28	8	36	8
EUU	Naïve model II	3.87	80	–	82	–	87	–
WLD	Naïve model II	0.44	44	–	50	–	60	–

Table 4 Selected forecasting models and forecasts for 2017 and 2020, for the variable Percentage of individuals using the Internet, based on historic data from 2006 to 2015 ($n = 10$)

Country group code	Selected forecasting model	Mean squared error	2015		2017 ($\tau = 2$)		2020 ($\tau = 5$)	
			Actual	Rank	Forecast	Rank	Forecast	Rank
ARB	Linear trend model	0.30	40	6	45	6	55	7
EAS	Naïve model II	0.49	50	4	55	4	64	6
ECS	Linear trend model	1.21	71	2	81	1	92	1
LCN	Linear trend model	0.48	55	3	61	3	73	4
MEA	Naïve model II	0.58	44	5	54	5	67	5
NAC	Exponential trend model	2.96	76	1	76	2	77	2
SAS	Exponential trend model	0.25	24	7	37	7	73	3
SSF	Linear trend model	0.52	22	8	26	8	33	8
EUU	Naïve model II	1.79	80	–	82	–	87	–
WLD	Linear trend model	0.05	44	–	49	–	58	–

European Union and the World). Actual values cover period from 2013 to 2015 whereas forecasted values are given for period from 2016 to 2020.

By observing Fig. 3, the potential of large growth in countries from South Asia is more obvious. Countries included in South Asia group are Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. All countries, except Maldives, have low or lower middle income. It is expected that benefits of Internet use increase will lead to higher competitive position and higher income level in South Asia countries in the near future.

5.3 Discussion

The best fitting forecasting models based on the longer past period, from 1996 to 2015, indicate the new ranking of the World regions regarding the Percentage of individuals using the Internet in the near future, 2017 and 2020. If the forecasts would be based on historic data for the shorter period, from 2006 to 2015, the different forecasting models fit the best and the new ranking of the considered regions would appear in both, 2017 and 2020.

For Arab World, an increase of Percentage of individuals using the Internet from 0.04% in 1996 to 40% in 2015, with the linear trend forecast of 55% in 2020, fixes this region in that year at the last (7th) rank based on shorter time series forecast. If a longer time series based forecast is studied, the Naïve Model II forecast is the most precise with the forecast value for 2020 of 60%, which position the ARB region to the 6th rank.

For East Asia & Pacific, the shorter time series based forecast that fits the best is the Naïve Model II, with the forecasted Percentage of individuals using the Internet for 2020 of 64%, which places the EAS group of countries to

the 6th rank. The same Naïve Model II is the best fitted for the longer time series and it puts the EAS region with the same value of 64% in 2020 to the 5th rank.

For Europe & Central Asia, the best fitted shorter time series forecast is the Linear Trend Model, with the forecasted Percentage of individuals using the Internet of 92%, which position the ECS group of countries to the 1st rank in 2020. The same Linear Trend Model is the best fitted if the longer historic time series is used, and it puts the ECS region with 94% to the 1st rank again.

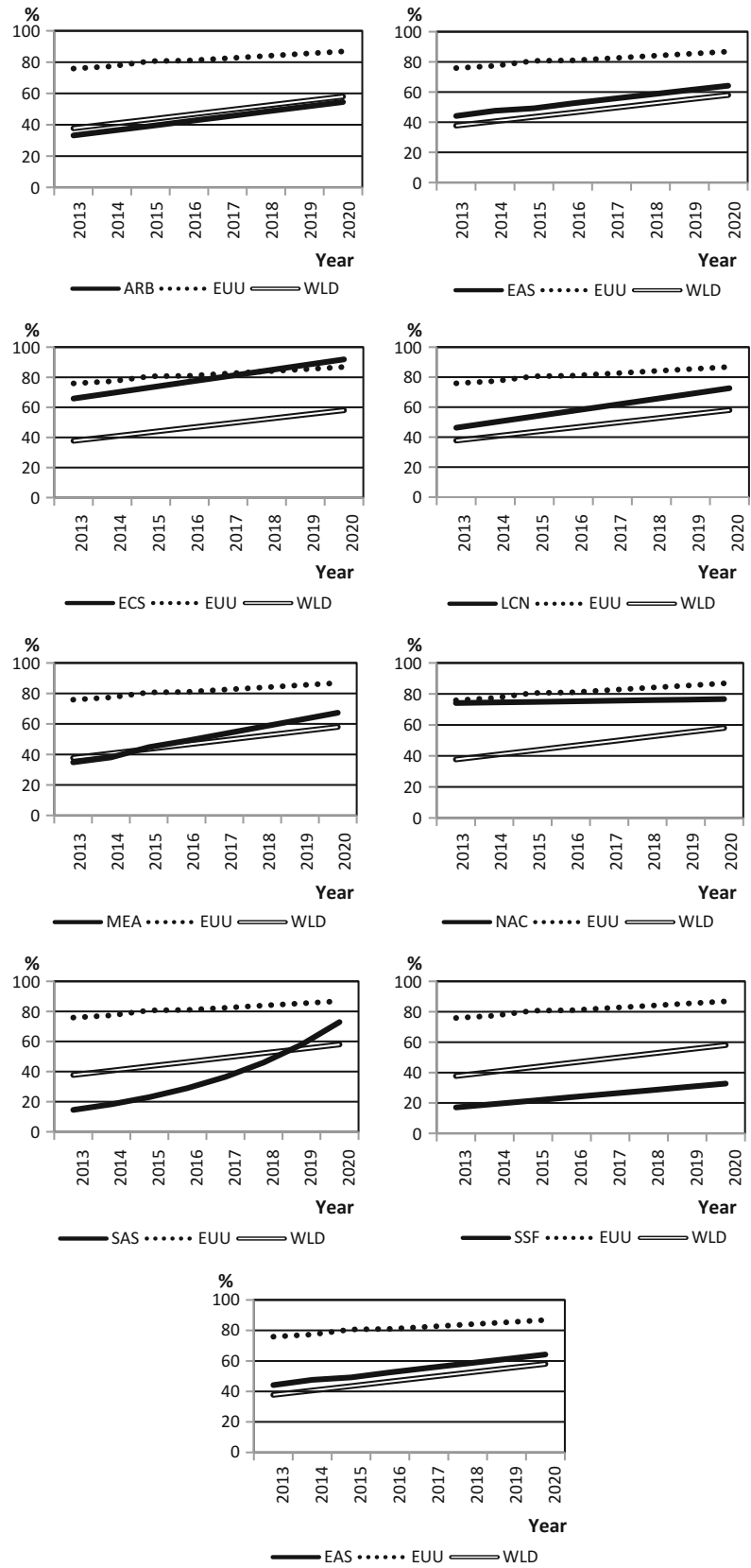
For Latin America & Caribbean, the shorter time series forecast that fits the best is the Linear Trend Model, with the forecasted Percentage of individuals using the Internet for 2020 of 73%, which puts the LCN group of countries to the 4th rank. The Naïve Model II is the best fitted for the longer time series and it places the LCN region with a very high value of 84% in 2020 to the 2nd rank.

In Middle East & North Africa, the Naïve Model II is superior for both time series lengths forecasting, and results with the same 67% as the forecast value of the Percentage of individuals using the Internet in 2020. But, the MEA region is positioned at the 5th rank for shorter historic time series period and at the 4th rank if the longer time series is used for forecasting.

For North America with an increase from 15% in 1996 to 76% in 2015, with the best fitted Exponential Trend Model forecast applied on the shorter time series data results for the NAC region with the forecast value of 77% in 2020, which is ranked by 2. The Naïve Model II is the best fitted if applied to the longer time series forecasting, and it gives to the NAC region the forecast of 83%, which ranks this region as the 3rd among eight considered regions of the World.

For the region of South Asia, the best fitted Exponential Trend Model forecast applied on the shorter time series, for the period 2006 to 2015, gave to the SAS region the forecast

Fig. 3 Percentage of individuals using the Internet for the observed eight World regions compared to EUU and the whole World, actual values from 2013 to 2015, forecasted values from 2016 to 2020



value of 73% in 2020 and the rank 3. But, much different forecasting value comes out when the longer historic time series, from 1006 to 2015, is used. The Naïve Model II is the best fitted in forecasting based on the longer time series, and it gives to the SAS region the forecast value for the Percentage of individuals using the Internet of 45% only, which ranks this region by 7 among eight considered World regions.

In the Sub-Saharan Africa region the shorter time series forecast that fits the best is the Linear Trend Model, with the forecasted Percentage of individuals using the Internet for 2020 of 33%, which puts the SSF group of countries to the last 8th rank. The Naïve Model II is the best fitted for the longer time series and it places the SSF region with 36% in 2020 to the last 8th rank again.

After European Commission (2015), achieving a Digital Single Market will ensure that Europe maintains its position as a digital economy world leader, helping companies in Europe to achieve a fast growth. Take full advantage of the growth potential of our European Digital Economy requires research and innovation to enhancement industrial competitiveness and better public services, investment in ICT skills and technologies, e.g. Big Data and Cloud computing.

6 Conclusion

The paper studies the fitting of the different forecasting methods based on two different lengths of the annual time series data for the Percentage of individuals using the Internet for eight World regions: Arab World, East Asia & Pacific, Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa, North America, South Asia and Sub-Saharan Africa. The paper investigate suitability of seven forecasting models for the development indicator named Percentage of individuals using the Internet for eight regions of the World using yearly time series data referred to the following two periods: firstly, from 1996 to 2015 (20 years), and, secondly, from 2006 to 2015 (10 years).

For the 2017 and 2020 forecasts, seven forecasting models were examined: three naïve models, geometric mean, simple average, linear trend and exponential trend model. The minimum mean squared error (MSE) indicated the best fitted forecasting model for the variable under study for each of the observed regions. Forecasting models based on the past period of 20 observations, from 1996 to 2015, or on the period of 10 observations, from 2006 to 2015, indicate different ranking of the World regions regarding the Percentage of individuals using the Internet level in the near future. But, forecasting using either a longer or a shorter time series

result with the same pattern at the top positions: instead of the North America, which was the leading region in 2015, the Europe & Central Asia region was shifted by forecasting to the top in both future years considered, in 2017 and 2020. Forecasting based on the shorter time series, from 2006 to 2015, shown that Sub-Saharan Africa, which was ranked as the last in 2015 (22%), remained as the last in 2017 (26%) and in 2020 (33%), while, on the second last position in 2015 (with 23%) there was South Asia, which remained the second last in 2017 with forecasted value of 37%, too. But in 2020, the second last position was forecasted for the Arab World region with 55% of individuals using the Internet. Forecasting based on the longer time series with 20 past observations, from 1996 to 2015, shown that Sub-Saharan Africa, at the last ranked in 2015 (22%), remained at the same rank in 2017 (forecasted value was 28%) and 2020 (forecasted value was 36%), whereas, on the second last position in 2015 (24%) and in the future 2017 (32%), as well as in 2020 (45%) there was South Asia region, while, in 2020 the forecasted Percent of individuals using the Internet for the Arab World region appeared to be better with 60%.

As benchmarks for comparison, European Union (EUU) and the World (WLD) are used, too. When using the longer time series, from 1996 to 2015, in most of the cases the superior forecasting model, for both 2017 and 2010, appeared to be the naïve model II, with the minimum MSE for seven regions, EUU and the World, and the linear trend model was the best only for Europe & Central Asia (ECS). When using the shorter time series, from 2006 to 2015, for most of the considered regions the superior forecasting model performed to be the linear trend, for four World regions and for the World (WLD) as the whole. It has been followed by the naïve model II, which was the best for two World regions and EUU. The simple exponential trend model appeared to be the best fitted model for two regions of the World only.

Using shorter time series for forecasting, European Union (EUU), as a region, stays as the world leader in digital economy with Percentage of individuals using the Internet of 80% in 2015, 82% forecasted for 2017 and 87% forecasted for 2020, enabling European companies to grow globally in a very fast way. The World the whole (WLD) is much weaker with 44% in 2015, and forecasts of 49% for 2017 and 58% in 2020.

The limitation of this research might be overwhelmed by introducing and modelling forecasts for additional economic and ICT development indicators, so that deeper insight enlighten the impacts on future development and rankings of the World regions, respectively. The connectivity, skills and the reasons of using the Internet should be explored across the World regions, as well.

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Impact of FDI on GDP and Unemployment in Macedonia Compared to Albania and Bosnia and Herzegovina

Agim Mamuti[✉] and Mehmed Ganic

Abstract

The main aim of this research is to investigate whether Foreign Direct Investment (FDI) affects economic growth and employment rate in the selected countries of Western Balkan region (Albania, Macedonia and Bosnia and Herzegovina). The hypothesized relationship between FDI and economic growth and unemployment rate was investigated using real and official data of FDI inflows as well as GDP for period between 2005 and 2015. Methodology used in the study is a multiple regression. Findings indicated that considering three countries of Western Balkans, FDI has considerable influence over their economic growth, except for the case of Bosnia and Herzegovina (B&H) where hypothesis has been rejected meaning that FDI has no considerable influence over economic growth in this country. On the other hand, when it comes to Albania and Macedonia, hypothesis was accepted which proved that FDI is significant contributor to economic growth of these two countries. In the last two decades, Macedonia has been one of the leading receivers of FDI, compared to other countries from Balkans, mainly compared to Albania and Bosnia and Herzegovina.

Keywords

FDI • GDP • Employment • Developing countries • Financial crisis

1 Introduction

During the 90s the economic situation in these three countries was very unstable, however, since the beginning of the new millennium crucial structural changes were undertaken for the countries' benefits. Even though positive changes were made, the economic legacy is still evident. The international movement of capital resulted in high significance level of FDI flows, not only because it represents a significant capital source, but also a source of intangible resources (marketing, technology, management). It is widely accepted in literature that FDI has statistical considerable influence on economic growth and development on both, developing countries and countries in transition. Considering specific history of the Balkan region, countries of this area without significant inflows of FDI may be faced with serious problems achieving of economic growth and rise of unemployment. For this reason, it is never enough of attention on developing countries, especially when it comes to politically complex Western Balkans region. These young states are still developing and struggling to attract FDI to be able to follow developed countries.

The economic growth of selected countries was highly instable and unpredictable. But, starting from middle of 1990s, the selected countries of region pursue to maintain macroeconomic stability, and increase their living standard, and to go toward ascending economic growth. Economic growth is the common goal of all countries. This paper will research the essential sources of financing economic growth in few developing countries in the Western Balkans.

The main purpose of this study is to investigate how FDI affects Economic Growth and Employment rate in context of selected the Western Balkan countries. Study's objectives are to provide empirical evidence regarding above mentioned relationship for some selected countries as: Albania, Bosnia and Herzegovina (B&H), and Macedonia. The paper covers FDI inflows and outflows as a measure for countries openness to investment and its ability to invest abroad.

A. Mamuti (✉)
Mother Teresa University, Skopje, Macedonia
e-mail: agim.mamuti@yahoo.com

M. Ganic
International University of Sarajevo, Sarajevo,
Bosnia and Herzegovina
e-mail: mganic@ius.edu.ba

GDP annual growth is the second parameter that will be considered as it represents the general baseline for all countries in terms of growth and economic outlook and gives us a bird's eye view in the overall economy of a country. The purpose of this analysis is to understand the role that each of these indicators has in a certain country, to assess the changes throughout a period of time and to make recommendations according to the conclusions that can be drawn from the analyzed data. Therefore, the research objective of this paper is to examine the impact FDI on economic growth and unemployment rate.

There are two aspects of contribution regarding this study: practical and theoretical. This study will enable theoretical contribution through provision of insights into the Western Balkans region to researchers all around the world when it comes to issues of FDI, Economic Growth and Unemployment. The findings of this study may be useful as up to date set of data for future researchers. Considering fact that only real and official data has been used in the study, all conclusions may be used by practitioners as well. More accurately said, government officials from Western Balkan countries may find this study and its findings as useful source of information in their activities.

This is especially significant for those countries whose FDI is still not great enough to be good contributor to their Economic Growth. On the other hand, the study provides recommendation for all responsible authorities in those countries (Albania, Bosnia and Herzegovina and Macedonia) to revise their investment regime policies and eliminate barriers for foreign investments.

2 Economic Background and Macroeconomic Developments of Albania, Bosnia and Herzegovina, and Macedonia

After the independence from Yugoslavia in the early 1990s, in the following years Macedonia and Bosnia and Herzegovina suffered from productivity losses. Later, in the period up to 2008 these countries had some growth, which stabilized the economic situation. When the global crises occurred in 2008, and the world's most powerful economies declined, it was time for the Macedonian and Bosnian economy to face the same destiny. But the effect of the world financial crisis was not very considerable for the Albanian economy.

The GDP growth rate serves as a measure of the growth of the economy and indicates how fast the economy is growing. It does so by comparing the GDP of one year to the previous. Generally speaking it is one of the main indicators of the macroeconomic outlook and it indicates the overall

“health” of the economy. Table 1 presents the GDP growth annual percentage in the countries of Western Balkans, Albania, Bosnia and Herzegovina, and Macedonia in the period between 2005 and 2015. There is slight variation in the percentage of GDP growth in B&H. In 2009 the lowest GDP growth rate might be seen. Since then Bosnia and Herzegovina has slow pace in increase of GDP growth.

Comparing with other European countries, these three Balkan countries are the countries with the lowest income and the unemployment rates remain very high. The table below shows the percentages of unemployment rates in these three countries in the period of ten years. Unemployment brings up the information about the portion of the labor force that is without work but available for and seeking employment. The unemployment rate is one of the indicators of the performance of the labor market. The issue of unemployment is one of the most discussed macroeconomic topics of nowadays (Table 2).

Comparing the Macedonian GDP per capita with the remaining South-East European countries, shows that it is below average and can only be compared with countries like Bosnia and Herzegovina and Albania. If Macedonia will enter the European Union it would be the poorest member state with the lowest GDP per capita (US \$4838 in 2013), which is way lower than current poorest states Bulgaria (\$7498 in 2013) and Romania (\$9499 in 2013) [1].

Comparing with Albania, Macedonia has experienced lower GDP growth rates. But in comparison with Bosnia and Herzegovina, it is slightly higher. Referring to the World Development Indicators (2016), the minor GDP growth of Macedonia was calculated in 2009 being -0.4 , and -0.5% in 2012, respectively.

When the global economic and financial crisis occurred in 2008 and the world's most powerful economies declined it was time for these three economies to face the same destiny. But as a result of rather poor trade openness to the world, the consequences were reflected with delay.

In comparison with the rest of the Balkan economies, the financial system in Macedonia resisted to the economic crisis due to its sound management of liquidity risks and positive orientation regarding the traditional banking activities. According to a study undertaken by the “German Chamber of Industry and Commerce”, in Macedonia in 2010, half of the respondents stated that they faced decrease in their annual income for 2009. On the other hand, more than 40% believed that the turnovers will increase in 2010. The situation did not last more than six months and by the second half of 2009 the confidence of the people improved regarding the existing situation. The recovery of the Macedonian economy highly depended on its main trading partners, which Germany and Greece, and the quantity of external were financing. The major concern remained the

Table 1 Annual GDP growth as %

Country name	Albania	Macedonia, FYR	Bosnia and Herzegovina
2005	5.72	4.72	8.76
2006	5.43	5.14	5.38
2007	5.90	6.47	5.73
2008	7.53	5.47	5.48
2009	3.35	-0.36	-2.87
2010	3.71	3.36	0.77
2011	2.55	2.34	0.91
2012	1.42	-0.46	-0.93
2013	1.11	2.93	2.39
2014	1.80	3.54	1.08
2015	2.80	3.67	3.03

Table 2 Unemployment rates in % (% of total labor force, modeled ILO estimate)

	Albania	Bosnia and Herzegovina	Macedonia, FYR
2005	13.83	–	37.3
2006	13.91	31.8	36
2007	13.5	29.7	34.9
2008	13	23.9	33.8
2009	13.8	24.1	32.2
2010	14.2	27.2	32
2011	14	27.6	31.4
2012	13.4	28.1	31
2013	15.6	27.5	29
2014	17.5	27.5	28
2015	17.08	27.7	25.5
2016	16.33	25.4	23.4

Table 3 Foreign direct investment, net inflows (% of GDP)

	Albania	Bosnia and Herzegovina	Macedonia, FYR
2005	3.22	5.56	2.32
2006	3.62	6.57	6.23
2007	6.10	11.68	8.80
2008	9.63	5.26	6.17
2009	11.15	0.79	2.76
2010	9.13	2.59	3.20
2011	8.14	2.53	4.84
2012	7.47	2.28	3.47
2013	9.81	1.73	3.72
2014	8.69	2.82	0.54
2015	8.70	1.81	2.94

account deficit, which by the year 2008 was 12.8% of the domestic GDP, up from 7.6% in 2007. In 2010 the rebound in exports and low imports showed significant improvement in the external balances of the country [2].

The gross domestic product (GDP) of the Republic of Macedonia throughout the history has shown slight increase year after year reaching 4.5 billion EUR in 2005. Right after gaining independence, the economic stability of the country

had to overcome the regional instability, which had to do with the aggression and civil war in Bosnia and Herzegovina and trade embargo imposed by Greece. As a result, in the period 1991–1995 the GDP in Macedonia decreased by more than 30%. The late 1990s worsened the economic stability due to the UN sanctions imposed on Serbia and Montenegro, which at that period used to be the country's major trading partners. However, the situation was stabilized through the financial support from the International Monetary Fund (IMF) and the World Bank's (WB) stabilization program in 1994. In 2005, the GDP reached the predicted growth rate of 4.1% in 2003, attaining over 4.4 billion Euros, annually. In the period from 2002 up to 2005 the government managed to boost the economic stability by increasing the GDP per-capita, keeping inflation at low level and sustain steady exchange rates.

The external debt remained constant at about 40% of GDP due to united public finances, which had direct impact on decreasing the government debt to GDP ratio. Even though, there was an increase in the number of small enterprises, which operated in the domestic economy, the official employment had a declining trajectory. Foreign Direct Investment (FDI) in the period after 2000 was steady, being around 2% of the gross domestic product. The larger share of GDP in the country during that period was kept by imports and exports of goods and services, showing better figures than EU 25 countries' average. For instance, the exports in 2005 in Macedonia totaled 36% of GDP, while in EU 25 they were almost 9% of GDP, whereas imports amounted to 58% in Macedonia and 10% in EU 25. This situation was created as a result of free trade agreement with the European Union and liberalization of the largest number of domestic products. Although, some positive economic changes occurred in the domestic economy, still the country had to fulfill some difficult tasks such as decreasing poverty and unemployment in the following years [3].

Although the economy showed steady growth, other economic activities, such as Consumer Price Index (CPI) experienced had a slight decrease. Moreover, the inflation was another component which was passing through a difficult period as a cutback in food and oil prices. In the following years public investment is expected to be one of the most important growth components, because the government has

planned to construct two additional highways which will be in benefit of the region. The manufacturing sector is also expected to maintain its position by being one of the most important growth factors followed by private consumption increase and unemployment decline. In recent year, Macedonia has introduced a technique of measuring poverty called Survey of Income and Living Conditions (SILC), which was firstly used by the EU countries. According to SILC, the number of Macedonia population at risk of poverty had a minor decrease from 27% in 2010 to 26.2% in 2012. The poverty tendency is not expected to suffer drastic change, being estimated to remain steady in the region of 30% in the years to follow. However, the construction sector is projected to be the main contributor to increase employment, mainly for the low-income families, followed by manufacturing sector and FDI exports that can be converted into job creation and help in poverty decrease [4].

According to [5], although the inflow of FDI in the countries of WB in recent years has increased, most of the benefits of FDI had Croatia and Montenegro, while inflow of FDI in Bosnia and Herzegovina and FYR Macedonia was negligible. The largest portion of FDI flows to the region was associated with the privatization of telecommunications and banks. Interestingly, there was little new manufacturing investment (Table 3).

3 Literature Review

The research about determinants of FDI started long time ago when [6] speculated the reasons why multinational firms appeared. His study explored the main drivers of producing of multinational corporations (MNCs) in selected host countries. He employed gravity model to examine the main determinants of FDI flows in selected countries. Only recently, determinants of FDI separated from the country and company conditions and international economics, and started to be researched independently.

Reference [7] explained why international production happens in his eclectic paradigm. This is first out of two classical models that are explaining determinants of FDI inflows. According to his research a company must have ownership advantages, which mostly include intangible

Table 4 Outputs of state effects model (FDI)

	State effects	Time effects	Two way fixed effects	PCSE	SCC
FDI	0.37*	0.20*	0.20	0.20*	0.20***
	(0.17)	(0.08)	(0.11)	(0.09)	(0.04)
R ²	0.14	0.21	0.14		
Adj. R ²	0.05	0.20	0.44		
Num. obs.	33	33	33		

*** p < 0.001, ** p < 0.01, * p < 0.05

assets Secondly there is an internalization process, which refers to ability to use those ownership advantages. And finally, there is location condition, which is of the most of interest for FDI research. Another important contribution of [8] is that he defined three main types of FDI based on motive that drives investment. Market-seeking type of FDI serves local and regional markets, where the market size and market growth of host economy are very significant determinants. As it replicates the production facilities in host country it is called horizontal FDI as well. The resource-seeking FDI has main goal to obtain resources that are scarce in-home country, thus the most important factors for this type of FDI are natural resources, raw materials, or low-cost labor. This type of FDI is also considered vertical, because it involves repositioning the production chain to the host country. The last type of FDI, efficiency-seeking, implies governance of geographically dispersed activities in economies of scale. Knowing Dunning's classification, it is concluded that most of the FDI is market seeking, which explains why developed countries receive more FDI than emerging ones [9, 10].

Researchers widely share opinion that FDI leads to Economic Growth. Reference [11] reported that studies show positive influence between FDI and economic growth, the rate of capital accumulation and variables that raise total factor productivity, such as education level, institutional quality, macroeconomic stability, political environment, and, potentially, trade openness.

In another study, [12] focused more on the effects of FDI for host country's economy. In this study, author did not only consider FDI as key component for successful and sustainable economic growth, but also as a part of a method to social improvement. She emphasized that the net benefits from FDI do not accrue automatically, and their importance differs according to host country and condition.

Reference [13] investigated role of FDI inflow on the post-communist Albania's economic growth. His findings indicated a significant long-term relationship between the country's economic growth and the inflow of FDI. Previous literature reported about Albanian FDI as promoters of growth. Reference [14] investigated direct relationship between FDI and Economic Growth through GDP and found another empirical evidence of relationship between two variables. Reference [15] confirmed findings of previous studies.

When it comes to Bosnia and Herzegovina, there are few studies that investigated relationship between GDP and FDI in the level of Bosnia and Herzegovina as individual state. In other words, it is very difficult to find research conducted with focus only on Bosnia and Herzegovina. Available scientific and professional reports that explain FDI and GDP relations of Bosnia and Herzegovina are usually studies of Balkans and Europe. Such example is work of [16] who

investigated the effects of FDI on transition economies in the Balkans region.

A few other studies were conducted with focus on Macedonia to examine relationship between FDI flows and Economic Growth [17, 18], while some of them researched Macedonia as a part of wider regional study [19, 20]. Researchers mainly agree that there is positive statistical relationship between FDI flows and GDP in Macedonian.

4 Research Methodology

4.1 Data

Considering fact that real and official data for all Western Balkan countries has been provided by World Bank Group and publicly available online, there was no difficulty to collect all necessary data. Unfortunately the quartile data were not available for these countries. Data has been downloaded in excel file which was formatted according to needs of this study. It is important to say that at any point in progress of this study, no modification of real and official data occurred.

4.2 Methodology

As stated already, researchers widely accepted assumption that FDI influences GDP of countries. There are many studies investigating this relationship using different scientific research methods. This relationship is not only obviously positive and significant, but all this story went step further since FDI is being expressed as a percentage of GDP in many scientific articles. A comparative analysis of three countries of the Western Balkans (Macedonia, Albania and Bosnia and Herzegovina) will be conducted in this research. First of all, a macroeconomic outlook of several indicators will be analyzed. The macroeconomic indicators analyzed are GDP growth rate (percent change) and unemployment rate as dependent variables and FDI (percent of GDP), as independent variable employed in our empirical model.

For this study, six hypotheses are developed on the basis of literature review. Even though there are already published studies dealing with relationship between FDI and GDP in Western Balkans region, there are very few studies considering country by country regression analysis, analysis in the level of Western Balkans region and cross country comparative analysis. Therefore, considering unique approach of this study which will take form explained in previous sentence, the literature review gap will be at least a little bit filled. Coming paragraphs will show that even though all Western Balkan countries are investigated when it comes to

Table 5 Outputs of state effects model (unemployment)

	State fixed effects	Time fixed effects	Two way fixed effects
Unemployment	0.30	-0.05	-0.11
	(0.21)	(0.04)	(0.17)
R ²	0.08	0.11	0.03
Adj. R ²	-0.04	-0.48	-0.86
Num. obs.	26	26	26

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

FDI and GDP, some of them were explained only as a part of wider region, without focusing on them individually.

Methodology used in the study is multiple regressions, and the main software used for this kind of statistical analysis was SPSS. Excel 2013 has been used as a supportive tool to present significant tables and graphs. The hypothesized relationship between FDI and Economic Growth and FDI and Employment rate was investigated using real and official data of FDI inflows as well as GDP for period between 2005 and 2015.

To summarize, following six hypotheses will be investigated in this study:

- H1: FDI has significant and positive influence on GDP of Albania.
- H2: FDI has significant and positive influence on GDP of Bosnia and Herzegovina.
- H3: FDI has significant and positive influence on GDP of Macedonia.
- H4: FDI has significant and positive influence on employment rate of Albania.
- H5: FDI has significant and positive influence on employment rate of Bosnia and Herzegovina.
- H6: FDI has significant and positive influence on employment rate of Macedonia.

The multiple regression statistical data analysis method utilizing "R" software will be utilized to empirically analyze the correlation between FDI, GDP and unemployment.

Note: In this study the statistical significance level will be taken at the conventional 5% level.

4.3 Findings and Interpretation

The impact of FDI on GDP. The results are presented in Table 4.

State Effects Model, which controls all variables that vary over the cross-sectional units but are constant over time, shows that the effect of FDI on GDP is significant at 0.05 levels. Thus, it can be claimed with 95% confidence level that one unit increase in FDI increases the GDP for 0.37 points.

Time Effects Model, which controls all the variables that vary over time but are constant over the cross-sectional units, is also significant at 0.05 levels. Therefore, it can be claimed with 95% level of confidence that one unit increase in FDI increases the GDP for 0.2 points.

However, the most preferred model in most applications is the one that includes both state and time fixed effects at the same time. This model is sometimes referred to as the "two way fixed effects model". The results show that when the model is controlled both for the variables that vary over time and cross-sectional units than the effect of FDI on GDP is statistically not significant. This shows that there are other variables rather than FDI which have significant impact on GDP.

The impact of FDI on Unemployment. The results are presented in Table 5.

The State Effects Model, which controls all variables that vary over the cross-sectional units but are constant over time, shows that the effect of FDI on Unemployment is significant at 0.05 levels. Thus, it can be claimed with 95% level of confidence that one unit increase in FDI increases the Unemployment for 0.30 index points.

The Time Effects Model, which controls the all variables that vary over time but are constant over the cross-sectional units, was also significant at 0.05 levels. Therefore, it can be claimed with 95% confidence that one unit increase in FDI increases the Unemployment for -0.05 index points.

Again, the results show that when we control both for the variables that vary both over time and cross-sectional units than the effect of FDI on Unemployment is statistically not significant. This shows that there are other variables rather than FDI which have significant impact on Unemployment.

5 Conclusion

Albania, Bosnia and Herzegovina, and Macedonia are small countries and in their economic development they must use the additional accumulation from abroad. Economic development over the past 15 years is characterized by insufficient investment in production and a low share of investment in gross domestic product, compared to developed countries. The inflow of foreign funds was

characterized by primarily investing in telecommunication and service companies, while very little was invested directly in manufacturing companies.

The data presented in this paper confirms what the [21] study has already stated. Foreign direct investment in the countries analyzed in this paper was biased toward the non-tradable sector and consumption. It was more frequently related to the privatization process, and repeatedly to service sector privatization, while the greenfield investment share was rather low. Privatization cannot be the orientation for future FDI attraction in the region, as the volume of the remaining available projects is, at least in some countries, relatively low.

What are the main reasons for the low impact of FDI on GDP and Unemployment rates? An obvious starting point is the absorptive capacity of the Western Balkans economies for inward FDI, which one might expect to be relatively low [22]. This might be driven by infrastructure, systems of education and training and quality of the educational institutions. Having in mind the recent history of wars and sanctions in the region, particularly important for the Western Balkans are political stability and control of corruption. FDI spillovers are also likely to be influenced by the general business climate and guarantee of fair competition.

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Insurance Coverage for IPRs: Possible Solution for Businesses in the GCC

Hanan Almawla 

Abstract

As a regional and international business hub, Gulf Cooperation Council (GCC) states have an important role to play for business holders to ensure providing a welcoming environment for businesses and enterprises. This certainly includes protection of IPRs owned by business entities through advanced legislations, and serious enforcement. Meanwhile, legal issues and concerns of Intellectual Property Rights (IPRs) are on the rise more than ever. The rapid technological developments put these rights under the imminent threat of infringement, leading to financial losses to right holders. Such losses have deeper impact when it comes to businesses and enterprises where IPRs are in fact a source of income. GCC states should therefore be concerned with securing protection of IPRs in order to maintain their position as an international and regional business hub. This protection ought to be achieved through advanced IP legislations and strong enforcement policy. At the same time, ensuring more protective measures for enterprises and businesses would minimize the risk of potential financial losses as a result of IP infringement. In search of possible ways to minimize such risks, insurance coverage comes across as a doctrine with potential advancement. Therefore, it is the aim of this paper to examine the intersection between insurance coverage and IPRs. It attempts to answer questions related to how an insurance policy can in fact be applied to save the interests of holders of IPRs. As the scope of IPRs is wide enough to include intellectual and industrial property, one needs to determine the types of IPRs that can be covered by an insurance policy. Despite the actual steps to unify laws of trademark and patents in the GCC states, its legislations

remain silent as to the question of insurance of IPRs. Hence, in order to address these issues, this paper will first examine the legal position of IPRs in GCC legislations. This will be followed by examination of the applicable legal rules to insurance policies in the GCC. Consequently, intersection of the two systems requires identification of the types of IPRs that can legally be subject to insurance policies in addition to any potential legal complications which can be associated with it from the view point of insurance companies. Finally, the paper shall conclude by evaluating the current legal position and proposing a way forward.

Keywords

Gulf cooperation council (GCC) • Intellectual property rights (IPRs) • Insurance of IPRs

1 Introduction

In today's world, Intellectual Property (IP) is a valuable asset to its right holders. In relation to businesses, IP is an essential source of income. A study conducted by the European Patent Office (EPO) estimated that 39% of the economic activity and 26% of employment in the EU is generated by industries with IPRs. In addition to that, employees of European companies that own IPRs make a 28% higher revenue than employees of companies that do not own IPRs [1].

Nevertheless, IP is in fact under serious threat in today's technologically developed world, as the possibility of IP infringement has accordingly increased, leading to remarkable financial losses for right-holders. A study published in 2013 by the Observatory and the Organization for Economic Cooperation and Development (OECD) estimated the value of counterfeit and pirated goods in international trade to be at €338 billion (USD 461 billion) globally, corresponding to 2.5% of world trade [1, p. 22]. For the smart-phones

H. Almawla (✉)
College of Law, University of Bahrain, Zallaq,
Kingdom of Bahrain
e-mail: halmawala@uob.edu.bh

industry, the economic effect on smart-phones sales due to counterfeiting is estimated at 45.3 billion EUR or 12.9% of total sales [2].

Protecting IP as an asset by safeguarding the interests of its right holders is key. As states of the Gulf Cooperation Council (GCC) [3] are considered a business hub in the region, they aim at maintaining a supportive business environment that can encourage further investment. This includes protection of IP as an asset to business holders. Trademarks, patents, and copyright are the three main pillars of any IP system, each being an asset and a source of income to its right holders. Yet the high level of IP infringement in third world countries imposes a serious threat on businesses holding IPRs. At the same time, infringement as a threat or as a risk triggers the question of insurance in relation to IPRs. Therefore, in the process of one's search in finding the most suitable solution to provide IPRs with the most effective protection in GCC states, it is essential to deal with questions of legislative protection of these rights, enforcement issues, and finally, whether insurance can actually be applied in relation to IPRs—in particular copyright, trademark and patents—to secure further protection to right holders.

Hence, we shall begin our discussion by an overview examination of how IPRs are protected in GCC states. This will be followed by a discussion of insurance policies in GCC states which naturally leads to examining the validity and effectiveness of intersection between the two doctrines i.e. IP and insurance.

2 Protection of IPRs in GCC States

The legal system in GCC states is part of the civil law system. Most of our civil law articles, including IP codes, were drafted in accordance with Egyptian and French codes. As a result, GCC legislations recognize the three main pillars of any IP system: copyright, trademarks, and patents [4].

Due to GCC states adherence to the international IP treaties, the level of legislative protection to IPRs in most GCC states is 'acceptable', as it meets the minimum international standards. Nevertheless, in the US Trade Representative (USTR) latest report, the copyright regime in Kuwait was found to be 'below' international standards [5].

Legislative protection for IPRs in GCC states is achieved via specific IP legislations. It is important to note that in relation to copyright, each GCC state applies its domestic author's right law, as there is no unified author's rights legislation at the GCC level. Patents, however, are subject to national laws as well as to a unified Patent Regulation at the GCC level, when applicants are seeking regional protection. Yet the most advanced step in relation to harmonization of IP laws in GCC is in relation to trademarks. Today, GCC

states apply GCC Trademarks Law which is a unified law for all GCC states. As the latter instrument has come into force in all GCC states, domestic laws of trademarks are no longer applicable. The following table lists laws applicable to IP in GCC states (Table 1).

Therefore, if the question was in relation to the level of *legislative* protection of IPRs in GCC states, one can say that it is 'generally satisfactory'. The International Property Rights Index 2017 provides a ranking for each country in relation to IP protection. The results for GCC countries are as follows [14] (Table 2).

Nevertheless, the main concern associated with IPRs in the region is not particularly related to the level of legislative protection, but rather to the level of enforcement [15]. Unfortunately, there is no available data from the judicial authorities—in GCC states—on the number of IP disputes settled in GCC countries. However, the issue was addressed by the annual watch-list produced by (USTR) where some Arab countries are placed on this list due to their categorization as *ineffective in enforcing IPRs*, as the report reads.

The problem of trademark counterfeiting continues on a global scale and involves the production and sale of a vast array of fake goods. Counterfeit goods, including semiconductors and other electronics, chemicals, automotive and aircraft parts, medicines, food and beverages, household consumer products, personal care products, apparel and footwear, toys, and sporting goods, make their way from China and other source countries directly to purchasers around the world and indirectly through transit hubs, including Indonesia and the United Arab Emirates, to third country markets such as Brazil, Nigeria, and Thailand that are reported to have ineffective or inadequate IP enforcement systems [16].

Interestingly, the inadequate IP enforcement system in the region was examined by some scholars from a cultural perspective, resulting in arguing that this could be attributed to rooted cultural justifications for infringement of IPRs in the Middle East [17]. Nevertheless, infringement of IPRs had certainly led to serious financial losses in the region. In a recent report published by IP experts, the financial loss in Arab states that is attributed to IP infringement was estimated to be \$3.5 billion per year [18]. As for the smart-phones industry, lost sales in Arab states due to counterfeiting was estimated to be 1.975,7 million euros for 2015 [2, p. 6].

3 Insurance Policies in the GCC

Insurance was an Italian concept, polished at a later stage by English experts. Its actual transformation took place after the industrial revolution [19]. Insurance as a concept is associated with one's fear from future possible, yet uncertain,

Table 1 Laws applicable to IP in GCC countries

	IPRS in GCC states			
	Copyright	Patents national protection	Patents regional protection	Trademarks
Bahrain [6]	Law No. 22 of 2006 concerning the Protection of Author's Right and Neighboring Rights	Law No. (1) of 2004 concerning patents and utility models	Patent regulation of the cooperation council for the arab states of the gulf (GCC) [7] In addition to national patent laws in each GCC state, an applicant may decide to apply for a Patent with protection covering all GCC states (regional protection). Such application has to be made through the GCC Office in Riyadh—KSA GCC Patent Regulation will be applied	Trademark law in the GCC is currently governed by a unified GCC Trademark Law (Regulation) [8]
KSA [9]	Author's rights law promulgated by Royal Decree No. M/41 of 2 Rajab, 1424 (August 30th, 2003)	Regulation of patents, integrated circuits, plants patents and industrial designs for 1425 H		
Kuwait [10]	Law No. 22 of 2016 concerning the Protection of Author's Rights and Neighboring Rights	Law No. (4) of 1962 concerning patents, designs and utility models		
Oman [11]	Royal Decree No. 65/2008 promulgating the Law on Author's Rights and Related Rights	Royal Decree No. 82 of 2000 promulgating patent law		
Qatar [12]	Law No. 7 of 2002 on the Protection of Author's Rights and Related Rights	Decree-Law No. (3) of 2006 promulgating patent law		
UAE [13]	Federal Legislation No. (7) for the year 2002 concerning Author's Rights and Neighbouring Rights	Federal Law no (31) of 2006 amending law No. (17) of 2002 regulating protection of patents, designs and utility models		

Table 2 Country ranking for IP protection

GCC country	Global rank	Regional rank
Bahrain	42	6
Kuwait	61	9
Oman	39	4
Qatar	22	2
Saudi Arabia	43	7
UAE	21	1

risks. Such risks could be associated with the potential damages to one's assets, money, property, health and so on. Thus, the goal was to create a system where the aim was to limit one's losses by providing one with recovery when such risks occur [20].

In GCC states, focus was on financial intermediation activities. As a result, other sectors, including insurance, remained underdeveloped. Moreover, the issue of insurance raised certain concerns, as it was argued that it was not in compliance with Shari'a rules, in particular, life insurance [21].

Nevertheless, the economic growth in the region, along with the high level of immigration of labor to GCC states required referring to at least health and vehicle insurances, and has in fact helped in boosting the insurance system in the region [21, p. 363], resulting in 34 licensed insurers in KSA alone, with an estimated premium of US \$6.87 million in 2013 [22].

Accordingly, legislators in GCC states regulated insurance through specific laws. Yet the general legislative framework for an insurance contract, its definition, conditions and elements is found in civil codes of most GCC states:

- The Bahraini legislator regulated insurance contract in Articles 686-741 of the Bahraini Civil Code (2001)
- The Kuwaiti legislator regulated insurance contract in Articles 773-809 of the Kuwaiti Civil Code (1980)
- The legislator in UAE regulated insurance contract in Articles 1026-1055 of the Civil Code (1985)
- The Qatari legislator regulated insurance contract in Articles 781-807 of the Civil Code (2004)

However, The Omani legislator in Article 735 of the Omani Civil Code (2013) merely states that insurance contract is to be regulated by special laws. Insurance is therefore addressed by the Omani Insurance Companies Law No. (12) of 1979. Meanwhile in KSA, insurance regulations came at a late stage. The first insurance regulation came into existence by The Royal Decree No. 1/8/2013. Prior to 2013, insurance companies were functioning through their branches in Saudi Arabia. However, these were foreign insurance companies. Today insurance companies in KSA are subject to the supervision of the Saudi Arabian Monetary Agency.

The insurance system in GCC states allows insurance coverage for any ‘risk’, provided it is an uncertain event that may take place in the future, does not intend to safeguard unlawful interest, and is not contrary to public policy and morals. GCC legislators provide for life insurance and insurance against fire as examples of what can actually be covered in an insurance policy [23]. In all cases, there is no clear mention of insuring risks associated with IPRs. Yet such risks would still fall within the general scope of liability against others.

4 IPRs and Insurance: Needed Intersection

As explained earlier, infringement of IPRs in today’s world is an inherent risk that any IPR holder should bear in mind. Hence, the idea of insuring right-holders against such ‘risk’ is natural [24].

The risk of financial loss associated with IP infringement is a serious concern to businesses where IPRs are in fact an asset. There is huge amount of money involved in litigation of IP cases in courts or even when settling a dispute through mediation or arbitration [25]. Hence, any business with IP assets may consider IP insurance to protect it against lawsuits brought by its competitors, damages against third party infringement, other legal expenses including expenses of having expert witnesses, legal attorney and so on [26]. In fact, showing insurance coverage to IPRs in a business portfolio will attract investment as it is a guarantee for interested investors [26, p. 8].

The concept of insuring IP was not far from reality and the intersection between the two fields was not an abstract idea. Therefore, right-holders started claiming insurance coverage of IP infringement under general liability policies. However, these claims were challenged by insurers on the grounds that IP is intangible [27]. As challenges and discussions became more intense and assets of high value were at risk, it was time to ‘tailor’ IP insurance policies.

Tailoring of IP insurance does not however mean that there is a fixed ‘template’ or ‘frame’ for an IP insurance policy. In fact the vast range of IPRs stands in the way of having a single template or frame, as IPRs include registered and unregistered

rights, with each type being subject to a different framework. Registered rights include patents, trademarks and industrial designs, whereas unregistered rights mainly concern copyright. There is no requirement in insurance laws that an IP right must be registered in order to have it covered through insurance. Thus, both types can be subject-matter for insurance protection as any work that is enjoying IP protection is an asset subject to potential future risk.

The subject matter for an insurance policy could therefore cover a company’s registered and unregistered IPRs i.e. patents, copyright, and trademarks. It may also be restricted to one or more of these rights as agreed by the parties [26, p. 10].

As for the types of insurance policies that cover IPRs, a general examination shows that an insurance policy is usually a defensive policy. Such a policy aims at protecting the insured against infringement proceedings brought against him by any IP holder. It will cover costs of IP infringement suit and any resulting judgments [26, p. 9, 28]. Insurance could also be an indemnity insurance, where it covers the insured against damage awards arising from claims relating to IPRs [25, pp. 16–17].

A less popular form of IP insurance is ‘enforcement’ coverage. This type of insurance coverage is of particular importance to small companies with valuable IPRs. This is because small companies are usually targeted by larger competitors. The latter assumes that infringement of small companies’ IPRs would most probably be safer as small companies are unable to afford litigation costs to defend their IPRs. Enforcement coverage provides small companies with protection against such actions, thus strengthening their position in the market [29].

Insurance therefore covers the legal expenses for infringement of one’s own IP or in case of alleged infringement of IPRs of others. It could also cover litigation as a result of breach of licensees [25, 30]. As for the geographical scope of protection, policies can cover national and global risks related to IPRs [25, p. 32].

The premium set by an insurance company will naturally be determined according to the value of subject matter to be protected, in addition to other factors such as the company’s history, its R&D work [25, p. 24, 31], and the geographical areas which the policy is expected to cover.

5 Proposing a Way Forward

The legal system in GCC states recognizes and protects IPRs. Insurance is well developed at this stage as insurance laws and regulations provide a clear framework for insurance companies to carry out their work. There is nothing in Insurance laws or IP laws of GCC states that prevents or restricts IP insurance.

Accordingly, this paper proposes the introduction of a harmonized IP insurance in the region. This step is certainly achievable in relation to trademarks and patents where harmonized GCC regulations already exist. As there is no fixed frame for insurance policies, it is expected that insurance companies carry out the needed research and evaluation to decide on the most appropriate insurance policy. This will certainly be affected by the level of enforcement of IP laws in each state. Countries such as the UAE which has taken serious steps in IP enforcement will be a more suited environment for insurance companies. The role of national courts should not be ignored. Foreign businesses with IPRs will be less hesitant if national courts in GCC states correctly apply IP laws to provide the needed protection for right-holders.

To sum up, IP insurance is possible as there are no legal restrictions in GCC laws. It is expected to benefit businesses and most likely encourage further investment of IPRs in the region. However, insurance companies may set their premiums high due to the likelihood of infringement on the one hand and weak enforcement level in GCC states on the other.

6 Conclusion

The importance of IP as an asset cannot be overlooked. Investment in IPRs is an essential factor when evaluating the net worth of any company in the market. Hence, providing sufficient protection for IPRs is key for investment. The more guarantees there are for IPRs, the safer it is for investors.

In GCC states, the legislative protection for IPRs is satisfactory as it, at least, meets the minimum international standards. However, the level of enforcement of these legislations is weak, which deprives these laws of their purpose. Naturally, such low level of enforcement is a serious concern for right-holders of IPRs. The inherent risk of IP infringement in today's world is in fact worsened by the fact that official authorities in a potential state of investment do not take the necessary measures to enforce these rights, thus making financial loss for companies with IPRs a likelihood rather than a mere possibility.

Yet the doctrine of insurance might provide IP with a certain level of security. The practice of insuring IPRs against 'risks' is a practice that has been adopted by European countries, UK, USA, Canada and Japan. At its minimum, IP insurance would provide right-holders with the comfort of not worrying about litigation expenses and, accordingly, encourage businesses with IPRs to invest in the region. Nevertheless, likelihood of IP infringement, along with the low level of IP enforcement in the region, are factors to be considered by insurance companies when drafting their policies and determining premiums.

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Integration of Applied Linguistics and Business Communication: A Pilot Study

Janet Madhu

Abstract

This paper gives an insight into integrating Business Communication and Applied Linguistics, and highlights the need for such an interdisciplinary study for a better and effective corporate communication among the students of Higher Education in the UAE. A literature review of the research done in the field of language and linguistics is discussed briefly, where it draws attention to the fact that a research from this perspective has not been done in the region. It also talks about the methodology adopted along with the identified objectives, and the tools used in gauging the results of the findings. Finally, the outcome of the experiment that was conducted, based on the four language skills (Listening, Speaking, Reading, and Writing) is analyzed and a recommendation was arrived at and tried as a remedial course on the relevant students, which had impacted improved and satisfactory results.

Keywords

Business • Communication • Language • Functional linguistics • Integration • Regional • Remedial • Recommendation

1 Introduction

Business Communication is one which applies the 7C's in its communication system, the 7C's being Clarity, Conciseness, Courtesy, Consideration, Concreteness, Correctness, and Completeness. The difference between General Communication and Business Communication is that BC involves less

of emotions in interaction, and is inclined more towards logic and facts.

Business Communication is nothing but the communication among people in an organization for carrying out business activities. It may be oral, verbal, written, and so on like team work and group dynamics.

The definition of Business Communication has taken a whole new perspective in today's environment with technology, virtual teams, horizontal and vertical communication, internet and intranet sharing etc. It includes all departments, staff, clients, and people involved who are aware of what is going on in the organization and around the globe.

In recent years, the Internationalization (Globalization) of education has become a major focus of national and institutional attention. There has been a substantial expansion in the manifestation and promotion of internationalization of education. It has its significance in the areas of educational quality, student mobility, student employment, teaching and learning.

This experimental paper is based on this concept of Globalization, and how it has impacted the university students, especially in the UAE where its effect is felt to the maximum on an otherwise conventional Arab culture.

Since a major impact of this globalization is among the university students, it is only relevant and understandable that many students opt for Business and Management studies. In this regard, it has become an obligation for them to compete in the global market, and for this they need effective communication skills. A need for an integration of Applied Linguistics along with Business Communication has therefore become very important, and research from this perspective became the area of interest.

This research is based on the acquisition and use of communication skills through the integration of Business and Technical communication and Applied Linguistics to improve communication skills of the university students in UAE which in turn would help them with better stance in Global Business and Communication.

J. Madhu (✉)

College of Education, American University in the Emirates, Dubai International Academic City, Dubai, United Arab Emirates
e-mail: marion.janet@aue.ae

Importance of Business Communication

Effective communication is significant for managers in the organizations to perform the basic functions of management, i.e., Planning, Organizing, Leading and Controlling. Communication helps managers to perform their jobs and responsibilities. It serves as a foundation for planning. All the essential information must be communicated to the managers who in-turn must communicate the plans to implement them. Organizing also helps effective communication with others. Similarly, leaders as managers must communicate effectively with their subordinates to achieve the team goals. Controlling is not possible without written and oral communication.

Corporates devote a great part of their time in communication. They spend time on face to face or telephonic communication with their superiors, subordinates, colleagues, customers or suppliers. Managers also use Written Communication in form of letters, reports or memos wherever oral communication is not feasible.

Thus, we can say that effective communication is an essential element for success in an organization. In other words, communication acts as the soul of an organization. To enhance the effectiveness in communication, be it written or oral, perception and application of the correct structural pattern is required in syntax, semantics, and pragmatics of the English language.

An effective and efficient communication system requires managerial proficiency in delivering and receiving messages. A manager must discover various barriers to communication analyze the reasons for their occurrence and take preventive steps to avoid those barriers. Thus, the primary responsibility of a manager is to develop and maintain an effective communication system in the organization.

An organization is an individual's first home as one spends the maximum time here only. No organization runs for charity; it is important that the organization achieves its goals. How does an organization become successful? How will an organization achieve its goals?

The employees are the assets for any organization and the profitability of any organization is directly proportional to the labor put by its employees. Putting labor does not mean getting involved in hard physical work or digging the gold mines, it refers to the smart work done by employees, transparency between the team members, free flow of information from the superior to the subordinates. How does free flow of information happen? How is the transparency between the team members achieved? This is through Communication and not only thorough communication but effective communication.

The integration of **Applied linguistics** now comes into being since it is an interdisciplinary field of study that identifies, investigates, and offers solutions to language-related real-life problems. Some of the academic

fields related to applied linguistics are education (<https://en.wikipedia.org/wiki/Education>), linguistics (<https://en.wikipedia.org/wiki/Linguistics>), psychology (<https://en.wikipedia.org/wiki/Psychology>), computer science (https://en.wikipedia.org/wiki/Computer_science), anthropology (<https://en.wikipedia.org/wiki/Anthropology>), and sociology (<https://en.wikipedia.org/wiki/Sociology>).

Per [1] “**Applied linguistics** began life in the 1950s as a postgraduate qualification. Its initial target, largely language teaching, has always been practical, policy-oriented. Its preparation at postgraduate level has been multidisciplinary and, as in mathematics, there is a continuing tension between pure (general, theoretical) linguistics and applied linguistics. It does not expect its conclusions to be buttressed with certainty (and it is unclear whether theoretical linguistics or any other social science can expect that, either). For applied linguistics, there is no finality: the problems such as how to assess language proficiency, what is the optimum age to begin a second language, what distinguishes native and non-native speakers, how we can treat memory loss, these problems may find local and temporary solutions but the problems recur. No doubt, once again, the same may be said of theoretical linguistics: whether all grammars are fundamentally one grammar; what the relation is between the sign and the referent; answers are partial, never final—the problems remain” [1].

According to [2] “**Applied linguistics** is an area of work that deals with language use in professional settings, translation, speech pathology, literacy, and language education; and it is not merely the application of linguistic knowledge to such settings but is a semiautonomous and interdisciplinary.

Applied linguistics is an interdisciplinary field of research and practice dealing with practical problems of language and communication that can be identified, analyzed or solved by applying available theories, methods or results of Linguistics or by developing new theoretical and methodological frameworks in linguistics to work on these problems. Applied Linguistics paves the way for functional and real-time English usage, suited to the context.

Thus, Applied Linguistics involves the investigation of practical problems of language learners (mainly second language learners). Its scope extends to education, culture, anthropology, psychology as well as communication.

This paper therefore has imbibed and integrated both disciplines to achieve that competency in communication, specifically to that of Business and Technical.

Speaking English as L2 learners, especially to the students of UAE has second language that has drawn more attention from the language researchers in this region. Researchers have been trying to cover and analyze the obstacles that might disturb the accuracy and fluency process in learning English. Arabic-speaking learners of English have different problems in English as any other foreign

learners of English as a second language (ESL). These problems differ according to the language skills in focus, i.e. speaking, writing, reading, or listening.

These problematic errors affect the oral and written fluency in the communication flow. This paper presents the most general problems encountered by the Arabic-speaking learners in English. Of those difficulties are: syntactic and grammatical difficulties that focus on the problematic grammatical errors in uttering noun phrases, verbs, pronouns, and genitives, interference difficulties that come from the overlap between Arabic and English, the problematic lexical choices—collocations in particular—and communicative difficulties.

Research conducted at Preston University and Zayed University among other universities has shown the importance of developing the oral proficiency skills of EFL learners. The need for such integrated study proved to be an essential component wherein ESP (English for Specific Purposes) has come into vogue as the university level students are taught need based English language proficiency. To make it clearer, it is observed that students who take up Bachelor programs at universities in the UAE are mostly employed in government and private sectors where competency of English language is tried and tested. Therefore, integrating Applied Linguistics which serves as the base for building up Business and Technical English has become a mandatory component of this research.

2 Literature Review

Literature Review indicates that research in the area integrating Applied Linguistics and Business Communication has not been experimented previously. Therefore, this research focuses mainly on the need and requirement of a study from that perspective.

In this study, a bridge between motivation and reinforcement has been identified to be the key role on the part of the ESL teachers and learners. While motivation is initiated by the ESL trainers, reinforcement should be implemented by the learners.

To better understand the students' motivation for learning English as a foreign language; it is helpful to examine the literature in two relevant areas: integrative or instrumental motivation and the factors affecting the students' motivation as they are major determinants for language acquisition and achievement.

2.1 Integrative and Instrumental Motivation

Motivation and needs are closely related. On the one hand, motivation is the fulfillment of needs, on the other hand,

human needs serve as drives or incentives which move one to a particular action. The best-known theory of human needs is Maslow's hierarchy of need. Maslow formulates a five-fold hierarchy of human needs which begins with biological needs and progresses upward to psychological ones; physiological needs, including the need for food and water; the need for safety; social needs, including belongingness and love; esteem needs, e.g. the feelings of self-respect and positive recognition from others; and self-actualization, which means the need for a sense of self-fulfillment.

In terms of the foreign or second language learning, the need for safety indicates that the L2 learner needs to be secure that learning the target language and culture doesn't affect negatively his or her own culture or language. Additionally, learning in general and learning languages needs a safe and relaxed atmosphere to facilitate language acquisition. Esteem and social needs also indicate that the learner needs to be a knowledgeable person who can communicate and integrate with others by learning their language. Failure to satisfy students' needs is likely to hinder their risk-taking and motivation. Psychologically insecure L2 learners can be very anxious [3] and if this happens, L2 learners regress in their needs, motivation, and performance in the classroom.

Motivation for learning a second/foreign language is defined as the learner's orientation with regard to the goal of learning a second language [4]. To investigate and realize the effect of motivation on second language acquisition, the two basic types of motivation (integrative and instrumental) should be identified. Integrative motivation is characterized by the learners' positive attitudes towards the target language group and the desire to integrate into the target language community. Instrumental motivation underlies the goal to gain some social or economic reward through L2 achievement, thus, referring to a more functional reason for language learning [5].

In [6] a model of motivation in second language learning called the socio-educational model is established. As a result of long studies and research, he concluded that the learner's attitude toward the target language and the culture of the target—language speaking community has great impact on language learning motivation. The model is concerned with the role of various individual differences in the learning of an L2. In the model, two classes of variables, imperativeness and attitudes toward the learning situation are said to contribute to the learner's level of motivation.

Gardner states that learning a foreign language is unlike any other subject taught in a classroom because it involves the acquisition of skills and behavior patterns which are characteristics of another community. He also claimed that motivation is a dynamic process where many other variables play a part and that this model can accommodate broader views. To assess various individual differences variables based on socio-educational model. Gardner developed the

Attitude/Motivation Test Battery (AMTB) which consists of these five categories: imperativeness, instrumental motivation, motivation, anxiety and attitudes toward learning situations. Gardner's model has been used in many motivational studies [7].

Speaking English for Arabs has been a significant area in learning English as a second language that has drawn more attention from the language researchers from the Middle East. Researchers have been trying to cover and analyze the obstacles that might disturb the accuracy and fluency process in learning English. Arabic-speaking learners of English have different problems in English as any other foreign learners of English as a second language (ESL). These problems differ according to the skill considered, in focus, i.e. speaking, writing, reading, or listening. This paper focuses on the speaking/listening communicative difficulties in English.

Arab learners make different errors in speaking English; such errors will be presented in this paper are those which are related to the oral tasks in English. These problematic errors affect the oral fluency in the second language development and the communication flow in ESL/EFL. This paper presents the most general problems encountered by the Arabic-speaking learners in English. Of those difficulties are: syntactic and grammatical difficulties that focus on the problematic grammatical errors in uttering noun phrases, verbs, pronouns, and genitives, interference difficulties that come from the overlap between Arabic and English, the problematic lexical choices—collocations in particular—and communicative difficulties.

2.2 Further Review

Research conducted at Preston University and from study on other universities has shown the importance of developing the oral proficiency skills of EFL learners. The results of those studies show that such skills were cited by prospective teachers and stakeholders as most important. This makes it incumbent upon TEFL programs to exert more efforts to meet their candidates' communicative needs and help them acquire the desirable communicative abilities that would allow them to work comfortably and effectively when they join schools/workplaces.

2.3 Methodology

The adopted methodology is claimed to be eclectic and focuses on communicative approached to language teaching, but because of teachers' practices in the class room, it is more likely a grammar translation method.

English language is a compulsory school subject in the UAE schools. Students experience 12 years of schooling before entering the higher educational institutions. Students at preparatory and secondary stages spend six 45 min English periods per week. Despite the shift from the traditional teaching methods to communicative language teaching, most English language classrooms continue to be places to memorize textbooks rather than practice communication and English is still to be treated as a school subject that needs to be mastered and tested rather than a tool form communication. Nevertheless, English language has recently become a heated topic in the UAE due to two things. First, the school graduates cannot join the institutions of higher education without passing the Common English Proficiency Assessment (CEPA). Secondly, the ministry of education has obliged the school administrations to learn English and pass the Test of English as a Foreign Language (TOEFL). So, success in learning English might determine one's upward mobility and future. But the challenges posed here is that, after acquiring the functional English knowledge the students in the UAE need to also equip themselves/be well versed in English for Specific Purposes (ESP), and in this case Business or Technical English.

2.4 The Objective of This Study

To find out and differentiate the communication skills of the students pursuing professional courses and working part-time in the corporate sector.

To find out the areas of deficiency in communication by the students as students and as employees.

To review and device strategies for effective teaching and learning of communication through Applied Linguistics.

To enhance their articulation to suit the business environment.

To enable the ESL learners to be trained to face the challenges of communication.

The study, therefore, constitutes an attempt to seek answers to the following questions:

- (1) to what extent do prospective students believe that they have acquired the necessary language competencies in merging Functional English with Business English;
- (2) to what extent do they believe that they have acquired the necessary cultural and literary knowledge that makes them aware of the English culture and literature;
- (3) to what extent are they familiar with English grammar and linguistics; and
- (4) to what extent do they believe that the TEFL program at Preston University has provided them with sufficient coursework in the above-mentioned areas?

3 The Instrument

A 32-item questionnaire was designed by the researcher based on extensive reading of the ACTFL guidelines in which language users are classified in three main levels Novice, Intermediate, and Advanced with clear indicators for each level in the four skills. In addition, the researcher looked at Stanford Foreign Language Oral Sill Evaluation Matrix (FLOSEM) a widely-used matrix by teachers to evaluate their student' oral proficiency skills. Since the TEFL program at Preston University has its own characteristics and since (FLOSEM) is not a comprehensive matrix that will cover all the domains intended to be researched by it is limited to oral proficiency skills and the ACTFL guidelines are not a matrix but guidelines, the researchers used the indicators of the guidelines and the descriptions in the FLOSEM as a guidelines for indicators of the guidelines and the descriptions in the FLOSEM as a guidelines for the design of the used instrument. The instrument underwent a three-stage process. First, the related literature was reviewed and then a first draft was created and handed to four experts in TEFL education, educational research, and measurement and evaluation to ensure face and content validity. Based on their comments and notes a second draft was created and piloted on 26 prospective teachers. Then, a final draft was created and administered to 143 prospective teachers. Items 1–20 investigate the participants' perceptions of their competencies in the four main language skills (listening, speaking, reading, and writing). Some items were designed to seek information regarding the participants' BLCs in each skill (e.g. I can clearly and easily understand the specific meanings which the speaker intends to convey—item 13). The other 12 items seek answers to the other three main questions: (1) the participants' perceptions of their cultural and literary competencies (items 21, 22, 24, and 26); (2) their perceptions of grammar and linguistic competencies (items 23, 25, 27; and 28); and (3) their perception on the sufficiency of the coursework in the above areas (items 29, 30, 31, and 32). The researcher used a five-point Likert Scale with the following variables (strongly agree, agree, undecided, disagree, and strongly disagree).

3.1 Study Hypothesis

Based on the findings of the few studies on language learning motivation reported above, it can be hypothesized that:

- The UAE higher education students like to learn English for utilitarian (instrumental) orientations;
- Most of the factors affecting the students' motivation toward learning English are related to the immediate learning context;

- The demotivating factors related to the teacher are the most dominant.

3.2 Experiment

The Questionnaire was also designed to assess the participants' perceptions of their specialist competencies. One hundred and forty-three prospective EFL teachers were selected based on availability from among 303 fourth and third year registered students in the TEFL program at Preston University. The researcher selected these two groups since they had already studied almost all courses related to specialist area; some of them had done the practical training as well. Others were doing practical training during the fall semester of 2009 while the rest were going to do it the following year.

An effective and deficient communication system requires managerial proficiency in delivering and receiving messages. A manager must discover various barriers to communication, analyze the reasons for their occurrence and take preventive steps to avoid those barriers. Thus, the primary responsibility of a manager is to develop and maintain an effective communication system in the organization. The results were computed in the form of mean, frequencies, and standard deviations (Fig. 1; Table 1).

3.3 Appropriateness of the Rationale for the Questions in the Context of the Survey

According to the survey questionnaire, the questions were based, or rather focused on the four skills of English Language Learning (Listening, Reading, Speaking, and Writing). This was intentionally done because these four basic skills are directly connected to the 'lack' or 'void' experienced in terms of 'inadequacy' in Business Communication by the L2 learners in UAE Universities.

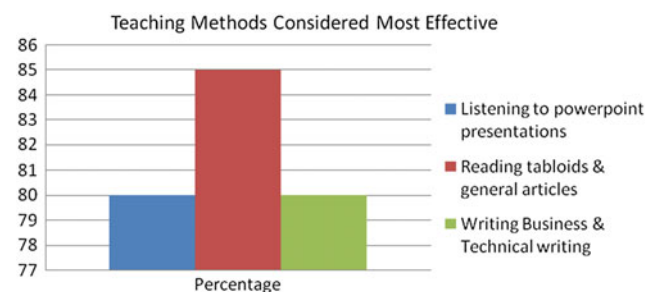


Fig. 1 Teaching methods considered most effective

Table 1 Preferred teaching methods by students

Preferred teaching methods	%
Listening to PowerPoint presentations	80
Reading tabloids & general articles	85
Writing business & technical writing	80

The inference made from the answers procured from the survey shows that many students in UAE have problems in their listening and writing. The first problem was traced to be poor listening capacity which catered to impatience and less concentration level. The Young and the Adult had very little grasping power due to many factors:

1. External factors like distraction from outside sources such as lack of seriousness from peer group, or technological devices, or many other sources like social networking proved to be real obstacles in learning and acquiring good language skills.
2. Internal factors like the imbibed attitude, or a cultural behavior that called for less endurance/focused thought process. It was observed that most students don't exist in the mind realm, but do live in their physical realm where their actions speak more than their thoughts.

In order to overcome this behavior patterns, and enable the students to think, a remedial plan was devised to formulate an intensive English Program in four levels—Beginner, Intermediate, Advanced, TOEFL/IELTS Prep, and a placement test was conducted to place the students in different levels accordingly. The rubric that was earmarked:

Score of 80 and above—TOEFL/IELTS Prep.

Score of 70–80—Advanced Level.

Score of 60–70—Intermediate Level.

Below 60 were placed at the Beginner Level. Each Level was for 60 h. CALL based language learning along with traditional/conventional teaching methodologies were adopted. Towards the completion of all the levels, a compiled Business English course with guest lecturers from corporate experts in a corporate mock scenario was given. This teaching program was also directed in giving importance to grammar structure, syntax, and the linguistic aspects of functional language skills by bringing about intonation variation, accent reduction, and spontaneous oral skills.

Functional grammar applications with pragmatics in the advanced level proved to be successful. Figures of speech and few common idiomatic phrases used in day to day English—Written and Spoken, were highlighted and encouraged for usage.

After completion of two semesters of these four levels, (if needed), some students needed only one or two levels, there was an apparent improvement in the students' English

language learning and acquiring skills which enabled them to perform as better students and employees.

Though the success rate proved to be about 50% in the beginning, the later years had a 65–70% success rate which proved to be fruitful and useful because the very purpose for which the program was implemented met with the expected.

4 Result and Recommendation

The modification of educational policies, the expectations of the society and the demands of the information era, all require schools to provide students with effective instruction in EFL as well as in other subject areas so that students can be fully prepared for future educational possibilities and be able to survive in an economically competitive world. Students may not reach the desirable literacy standards in English and in other subject areas unless schools are provided with competent teachers. Therefore, the first challenge is perceived as a lack of competent language teachers. Mostly English is taught with a lot of native language interference.

EFL prospective teachers need to be prepared in multiple areas, namely language skills, language and linguistics, culture and literature, pedagogy, psychology, and hands-on teaching experience. Researchers such as [8, 9, 10] among others point out that EFL prospective teachers need to be proficient in the target language and its culture, well qualified in pedagogy, curriculum design and curriculum implementation, and excellent in using modern technologies. TEFL programs in the UAE and elsewhere in the region play a significant role in the preparation of school TEFL teachers. Therefore, fact-findings in relations to the effectiveness of these programs will continue to be very essential and needs to be performed periodically. Further research is essential in the areas of program designs, program effectiveness, course content analysis, the nature of classroom instruction and the impact of these on the development of the candidates' professional, personal, and specialist competencies.

Even though the discussion so far had been about the use of language and its linguistic application for ESL students in Business environment, the issue that is looked upon here is not only the linguistic efficiency but also the effective application of Business communication. So, in incorporating English language structure with Business communication in the curriculum made all the difference in this approach of

study. This did pose many challenges as well since not all students were receptive to this integrated approach because they felt that they were well versed in English. So, to convince them to follow the set methodology of study, a few tests on grammar and structure was conducted. When they underperformed in these tests, it made them realize that linguistic elements in the syllabus such as Phonetics, Word stress, and Sentence stress are equally important along with Idioms and Phrases.

The Business communication taught encompassed Business letters, Minutes of the meetings, Agendas, Project proposal, Project report, and theory portions of communication like, Barriers to communication, Face-to-face communication etc.

To sum up, it can be said that this integrated study of English Language with Business communication is a necessity for proficiency in language is fundamental to all disciplines because the two forms of communication, namely, spoken and written predominates the industry world. Presentations (oral and written) captivate audience to plan for action. Corporate world needs linguists and communication experts to develop monetary wealth globally, and in the current scenario, English is dire need to a well-educated society, and has become the elixir of professional life.

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Mapping Creative Pedagogies in Fashion Design Education—Fashion Design Program at American University in the Emirates as a Case Study

Shlagha Agarwal

Abstract

The creative industries are “sectors of organized activity whose principal purpose is the production or reproduction, promotion, distribution and/or commercialization of goods, services and activities of a cultural, artistic or heritage-related nature”, according to UNESCO [1]. Fashion is an integral part of these cultural and creative industries. Creative pedagogies play an important role in establishing successful professional fashion design practice that in turn contributes to the growth of professional industries. They seek to engage students as active learners, promoting aesthetic enquiry and reflective thinking and allowing them to develop an independent vision by making, doing, critical reflection and praxis. This paper investigates creative pedagogies in fashion design education and practice. The American University in the Emirates (AUE) undergraduate fashion design program is selected as a case study for this research. Key creative methodologies are explored, analyzed and mapped to the courses in the context of professional design practice.

Keywords

Creative pedagogies • Creative industries • Fashion design education

1 Creative Industries

The world’s creative industries have witnessed remarkable growth in the last few years and have become fundamental for the development of a knowledge-based economy. According to the United Nations, between 2002 and 2011, world trade in creative goods and services more than

doubled, amounting to nearly USD 630 billion by 2011 [2]. UNESCO defines the cultural and creative industries (CCIs) as “sectors of organized activity whose principal purpose is the production or reproduction, promotion, distribution and/or commercialization of goods, services and activities of a cultural, artistic or heritage-related nature” [1]. Traditionally, the creative industries have played a prominent role in the MENA region, and considerable growth in media, contemporary architecture, art and fashion has modernized the creative industries in the Arab world. Though the design industry does not have an internationally accepted or standardized classification/definition, it is an integral part of the creative industries and often encompasses segments such as arts, architecture, interior design, fashion, graphic design and product design [2].

1.1 Design Industry in UAE

The UAE generated \$27.6 billion in design revenues in 2014 [2], the highest in the MENA region, and the design business in the UAE is forecast to be worth nearly US \$36 billion by 2019 [3]. The creative industries in the UAE are thus in a phase of quick growth, with immense support and impetus being provided by the government. The Dubai Creative Clusters Authority (DCCA) was established in 2014 to foster Dubai’s creative industries and harbor talent from across the world by promoting entrepreneurship and innovation [4]. As part of DCCA, the Dubai Design and Fashion Council (DDFC) has been established by the Dubai Government to establish and promote Dubai as a regional and global destination for design [5]. DDFC aims to develop a sustainable world-class industry by providing in-depth market intelligence and boosting local and regional talent in the fields of fashion design, product design, architecture, interior design, and graphic design. The Dubai Design District (d3) was launched in 2104 as the professional design hub of Dubai offering a custom-built facility for designers, entrepreneurs, international brands, design studios and design industry events [6].

S. Agarwal (✉)
American University in the Emirates, Dubai, United Arab Emirates
e-mail: shlagha.agarwal@aue.ae

1.2 Design Education in UAE

As mentioned by Faerm and researched by Wolff and Rhee, the design industries of any country are invariably linked to design education which creates good designers. Design education cultivates cultural and creative talents and offers intellectual support to the development of the creative industries, which in return facilitates the growth of design education.

Higher education in design in the UAE is a relatively new phenomenon. Traditionally, design education had been limited to training programs and vocational courses. But with the evolution of the UAE, and the foresight of its leaders, design education was recognized as imperative to develop the skilled workforce necessary for growth. Several institutes have since been established that offer undergraduate, diploma and short-term courses in the various fields of design such as graphic design, interior design, fashion design, animation, jewelry and product design. The state-of-the-art campus of the Dubai Institute of Design and Innovation (DIDI) is expected to open at Dubai Design District by autumn 2018 [6]. With major strides being taken to promote and provide a platform to local designers, design education in Dubai shoulders a major responsibility of producing graduates well-equipped with the right skills and knowledge to make their mark in the competitive arena. The growth of cultural and creative industries rests with the development of novel approaches to design education that would help establish advanced pedagogies.

2 Creative Pedagogies

Creativity in design education is the ability to generate new ideas and to combine existing ideas in new ways to find novel solutions to problems. Creative pedagogies help in establishing teaching strategies directed towards fostering creative thinking skills to prepare students for successful professional practice. There have been many explorations in art and design pedagogy in higher education. However, for this study, after a careful examination of creative pedagogies, five pedagogies were identified and selected due to their applicability and relevance to the field of fashion design.

The concept of creative pedagogy was introduced by Andrei Aleinikov in 1989. He opined that if pedagogy is the study of the process of teaching, then creative pedagogy is the science and art of creative teaching [7]. It is a branch of pedagogy that highlights the leading role of creativity for effective learning. Creative pedagogy has also been defined by Seals et al. as “Teaching and classroom practices that require an unorthodox and/or innovative approach to scaffolding students in their learning process” [8]. In its essence,

creative pedagogy teaches learners how to learn creatively and become creators of themselves and their future.

An open-minded design pedagogy emphasizes not just the finished product, but the process of designing and developing it through one of several methods, thus not choosing one method over others as the appropriate one. In a fashion studio, knowledge is acquired and applied simultaneously in an interactive space as hands-on learning is critical in this practical field [9]. Since fashion design is focused on designing for the human body that is 3-dimensional, an understanding of the “form” is cultivated and interpreted through observation, measurements, drawing, pattern making and construction techniques. Lau highlighted the importance of carefully designing students’ learning activities and projects in higher education so they can realize their potential and achieve maximum creative output [10].

Craik had recognized early in 1993 that fashion is clothing behavior that is often determined by situations and contexts and is an integral part of acculturation [11]. The cross-cultural differences in the concept of creativity were examined by Weiner through a comparison of certain cultures, and he mentioned how creativity is evolving in the contemporary globalized context [12].

Though research in fashion design education is picking up, many believe it is still relatively under-theorized compared to other areas of art and design education such as architecture, industrial design and fine arts [13]. This permits fashion educators to develop and support scholarly activities that would enrich students’ learning and experience, including innovative fashion design pedagogies. According to Drew, Bailey and Shreeve, there is lack of information about student learning approaches, especially for fashion design [14]. Since there is increased material and cultural interaction across the world due to the globalization, we need to find and implement pedagogies to bridge the gap between industry and design education.

2.1 Lin’s Three-Element Framework of Creative Pedagogy (Creative Pedagogy # 1)

The three elements of creative pedagogy—creative teaching, teaching creativity and creative learning—were first outlined by Lucas in 2001 [15]. Drawing from this research, as well as the works of Jeffrey and Craft [16], Lin proposed a conceptual framework of creative pedagogy to offer a more holistic view of enhancing creativity through teaching [17]. This pedagogy suggests a reciprocal interaction between the three interrelated elements—creative teaching, teaching for creativity, and creative learning—illustrating the relationship between creativity and pedagogical practices (Please refer Fig. 1).

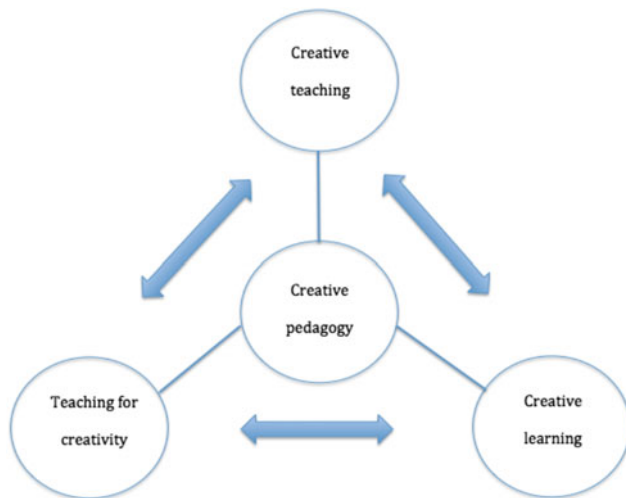


Fig. 1 The three elements of creative pedagogy [17]

The first element, creative teaching, focusses on teacher practice and aims to actively engage the learner through imaginative, flexible, dynamic, interactive and innovative approaches [16]. Thus, a creative teacher may not follow a set path for a lecture but achieve the learning outcomes through divergent methods and acting spontaneously.

The second element, teaching for creativity, considers the significance of a supportive environment by creating a learning context where the students' contributions are appreciated and they share the responsibility for the outcome. The open-minded atmosphere created by the teacher is encouraging and appreciative of independent thinking.

The third element, creative learning, is learner-focused and emphasizes the importance of learning through questioning, experimenting, observing and inquiring, drawing on the human nature of exploring out of curiosity.

2.2 Cremin et al's "Creative Teaching Framework" (Creative Pedagogy # 2)

After surveying 20 schools over one year, Cremin et al. suggested a model for creative pedagogy in which creative teaching is a dynamic interplay between three dimensions that are central to creative practice [18]. The pedagogy lays emphasis on the importance of the personal qualities of the teacher and the ethos of the class and school in addition to the pedagogy adopted (Refer Fig. 2).

Cremin observed and elaborated on each of these aspects, citing that creative teachers have a number of characteristics, some of them being originality, curiosity, autonomy, thorough subject knowledge and an ability to make connection with their students through appreciation and encouragement. They demonstrate enthusiasm and commitment as well as

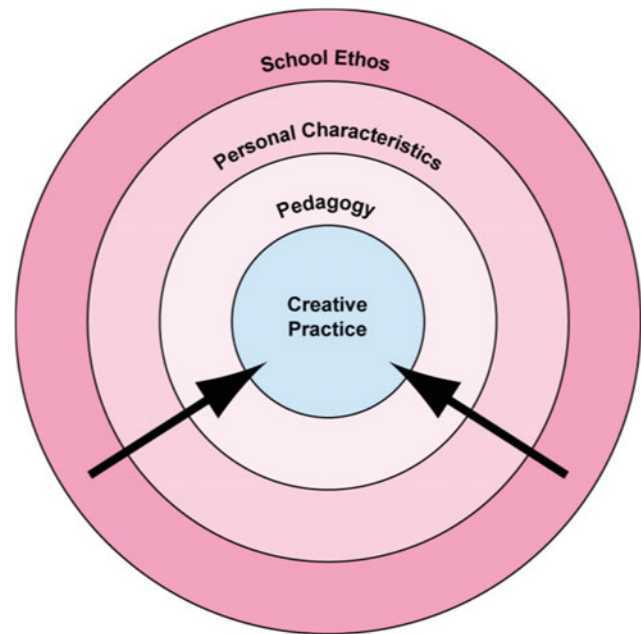


Fig. 2 Model of the creative teaching framework [18]

are flexible and adaptable in response to their learners' requirements.

The ethos is reflected in the willingness of students to express without expecting to be judged. It is an inclusive environment where they feel respected, safe, valued and trusted, taking responsibility for shaping their own learning.

The pedagogy adopted by the creative teacher encourages openness and critical reflection, fostering the autonomy of the learners in the process.

2.3 MacDonald and Bigelow's Pedagogy of Student Engagement in Competitions (Creative Pedagogy # 3)

Based upon Beghetto's suggestion [19] that student engagement in competitions could lead to learning and self-improvement, MacDonald and Bigelow conducted a study on middle-school students and found that theme-based competitions promote learning in fashion [20]. The students become an active part of the dynamic creative process, making decisions, setting goals, and achieving the result through an inclusive approach. This 'learner inclusive' strategy, as mentioned by Jeffery and Craft, encourages ownership and control that motivates the students to be creative and responsible. They are empowered with increased knowledge, awareness and reinforcement of meta-cognitive learning. Macdonald and Bigelow concluded that theme-based design projects are important for students' active learning and creative development. A variety of

assessment tools and valuable feedback from professionals in the industry belonging to different regions of the world boosts their self-confidence [16].

2.4 Costa's Pedagogy of Participative Teaching (Creative Pedagogy # 4)

Costa carried out research on the teaching benefits of experience outside the classroom in "non-controlled complex environments". The spontaneous situations and contexts generated by such environments activate a learning mechanism where students learn by reacting and responding, thereby seeing the teacher in the role of a "facilitator". According to Costa, this is a participatory teaching method and falls at the widest point of the Learning Pyramid by World Bank Group, adapted from the Learning Pyramid by National Training Laboratories in Bethel, Maine (Refer Fig. 3) [21].

The students thus become active learners by participating in real life situations and looking for suitable solutions, thereby not fulfilling the teacher's expectations but working to develop themselves.

2.5 Vaughan's Pedagogy of Ambiguity (Creative Pedagogy # 5)

Vaughan explored art and design pedagogy, concluding that the creative industries are unpredictable and students need to be prepared to deal with uncertain demands. Therefore, the creative fields relate to knowledge that may not have tangible constructs, and rely on ambiguity to a certain extent since learning parameters may not always be explicit or

clearly defined. In the field of fashion, students do not learn by rote or formula, but by practice based on an understanding of the context. There are social and political contexts that frame this pedagogy, and the students are successful based on a clear foundation of the context in which the design is to be created. Thus, this pedagogy deals with competencies and skills imparted to the students so they can operate in the "complex of uncertainties".

Since creativity goes beyond "right" and "wrong", educators need to balance ambiguity and openness with formative assessments to let students comprehend the instructor's expectations. Critiques therefore play an important role in this area since they encourage the students to express their views and evaluate their own work as well as the work of their peers [22].

3 Creative Pedagogy in Fashion Education—AUE as a Case Study

Fashion design education is intricately linked to the multi-billion-dollar fashion industry. In this era of over-consumption, the rate of apparel production is unprecedented. Creative pedagogies are even more relevant now to feed the fashion industry with a generation of knowledgeable and skilled designers possessing critical thinking and problem-solving skills.

The case study was conducted to explore the creative pedagogies and their applicability in fashion design education. The sample selected was the fashion design program at American University in the Emirates located in Dubai International Academic City. The College of Fine Arts and Design at the university offers a four-year undergraduate program with four areas of specialization, viz., fashion design, interior design, animation and graphic design. The foundation year focusses on several areas of general education, while their creative side is engaged in the core and specialization courses. To graduate, a student must complete 11 general courses (33 credit hours), 9 core courses (27 credit hours), 12 specialization courses (54 credit hours) and 4 elective courses (12 credit hours). This mix of courses provides balanced and comprehensive learning that engages and trains the students for the dynamic design industry. The capstone experience as the last course of the undergraduate education is the development of a graduate portfolio and fashion collection that showcases the student's abilities and launches them into the industry.

A detailed study and analysis of the curriculum, the courses offered, syllabi, teaching methodologies, resources and learning outcomes was carried out. The selected pedagogies were mapped to the course offerings after a careful examination of the syllabus and the ethos behind the creative pedagogies. Since art and design students rely heavily on

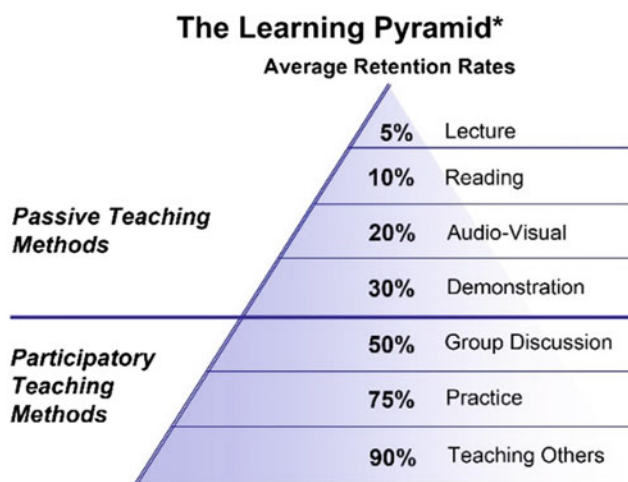


Fig. 3 *Adapted from the Learning Pyramid by National Training Laboratories in Bethel, Maine [21]

their tutors for feedback and assessment of the quality of their work, these pedagogies aim to move in a direction where parameters are not well-defined, non-negotiable or explicit, rather there is an open-ended process of enquiry, based on experimentation and risk-taking to assess the appropriateness of solutions per context.

4 Analysis

The fashion design curriculum at AUE is typically framed by practical aspects of courses that aim to provide students the skillset required by the industry. In addition to this technical competence, the education is tailored to stimulate and ameliorate the creativity of future designers through a contextual approach that will enable them to succeed in creative industries.

After a careful consideration of leading creative pedagogies and the fashion design curriculum at AUE, the mapping of courses to creative pedagogies was carried out to identify the appropriate methodologies for fashion design (Table 1). The applicability of each pedagogy to course learning outcomes was judged in relation to the course content, as well as the projects and practical work required in the course (Tables 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13). It was found that Lin's creative framework pedagogy and Cremin's "Creative Teaching Framework" are the most appropriate as they can be

applied to all the courses with minimum 40% and maximum 100% mapping. This can be attributed to the wide-ranging and all-encompassing nature of the pedagogies as they emphasize not just teaching methodology, but also the qualities of the teacher, learning of the student and environment of the class/school. MacDonald and Bigelow's pedagogy of student engagement in competitions, Costa's pedagogy of participative teaching and Vaughan's pedagogy of ambiguity have been found to have limited application, with 0% suitability in several courses. They find favor mostly with advanced level courses that are offered in third or fourth year. This could be due to the fact that these methodologies relate to experience outside the classroom or the ambiguous nature of creativity, thereby limiting their relevance for first and second year courses and those that focus primarily on imparting defined technical skills.

Interestingly, for the "Capstone graduation project", which is the last course to be completed before graduation and involves the conceptualization to execution of a fashion collection, all the pedagogies can be applied 100%, except pedagogy Vaughan's pedagogy of ambiguity which has only 50% mapping.

Therefore, a single or a combination of creative pedagogies can be used in the fashion design program at American University in the Emirates for the enhancement of students' learning. This applicability depends, to a large extent, on the kind of projects assigned for the course.

Table 1 Mapping of fashion courses to creative pedagogies

Course code and name of course/creative pedagogy	Creative pedagogy # 1	Creative pedagogy # 2	Creative pedagogy # 3	Creative pedagogy # 4	Creative pedagogy # 5
Introduction to the fashion industry	✓	✓	–	✓	–
Introduction to textiles, materials and processes	✓	✓	–	✓	–
History of costume	✓	✓	✓	✓	✓
Garment construction	✓	✓	–	–	–
Fashion studio I	✓	✓	✓	–	–
Fashion illustration	✓	✓	✓	✓	–
Fashion merchandising	✓	✓	–	✓	–
Fashion studio II	✓	✓	✓	✓	–
Patternmaking	✓	✓	✓	✓	–
CAD for fashion design	✓	✓	✓	✓	✓
Fashion design by draping	✓	✓	✓	✓	✓
Capstone graduation project	✓	✓	✓	✓	✓

Table 2 Mapping of course learning outcomes to creative pedagogies

Introduction to the fashion industry					
Course learning outcomes	Creative pedagogy # 1	Creative pedagogy # 2	Creative pedagogy # 3	Creative pedagogy # 4	Creative pedagogy # 5
Understand the stages and key aspects of the fashion design process in the industry	✓	✓	–	–	–
Comprehend the principles, theories and terminology related to the field of fashion	–	–	–	–	–
Recognize the various segments of the fashion industry and compare their operating styles	✓	✓	–	✓	–
Identify and describe the role of technology and software in producing contemporary fashion	✓	–	–	✓	–
% Applicability of pedagogy	75	50	0	50	0

Table 3 Mapping of course learning outcomes to creative pedagogies

Introduction to textiles, materials and processes					
Course learning outcomes	Creative pedagogy # 1	Creative pedagogy # 2	Creative pedagogy # 3	Creative pedagogy # 4	Creative pedagogy # 5
Understand textile materials in terms of their classification and complete process of production	✓	✓	–	–	–
Use textile terms to identify and define fabrics and their characteristics	✓	–	–	–	–
Recognize and recommend fabrics suitable for various end uses considering the cost, properties and performance	✓	✓	–	✓	–
Demonstrate the knowledge of fabric care and maintenance procedures in accordance with the content, structure and finishing	✓	✓	–	–	–
% Applicability of pedagogy	100	75	0	25	0

Table 4 Mapping of course learning outcomes to creative pedagogies

History of costume					
Course learning outcomes	Creative pedagogy # 1	Creative pedagogy # 2	Creative pedagogy # 3	Creative pedagogy # 4	Creative pedagogy # 5
Understand how social, economic, and artistic movements influence fashion	–	–	–	✓	–
Identify the general styles of clothing in all historical periods	✓	–	–	–	–
Appreciate the history of fashion design in the Far East & Asia and recent adaptations	✓	–	–	✓	–
Analyze the design features and elements by comparing historical and contemporary examples	–	✓	✓	✓	–
Demonstrate the ability to interpret and apply historical inspirations to contemporary fashion design	✓	✓	✓	✓	✓
% Applicability of pedagogy	60	40	40	20	20

Table 5 Mapping of course learning outcomes to creative pedagogies

Garment construction					
Course learning outcomes	Creative pedagogy # 1	Creative pedagogy # 2	Creative pedagogy # 3	Creative pedagogy # 4	Creative pedagogy # 5
Identify the parts and skillfully operate a sewing machine	–	–	–	–	–
Construct a variety of sewing techniques such as seams, seam finishes, garment techniques, hems, and closures	✓	✓	–	–	–
Select suitable fabrics for garments, home decorating items, and fashion accessories according to sewing patterns and the intended end use of items	✓	✓	–	–	–
Interpret the guide sheet and various instructions and symbols to complete a sewing project	✓	✓	–	–	–
% Applicability of pedagogy	75	75	0	0	0

Table 6 Mapping of course learning outcomes to creative pedagogies

Fashion studio I					
Course learning outcomes	Creative pedagogy # 1	Creative pedagogy # 2	Creative pedagogy # 3	Creative pedagogy # 4	Creative pedagogy # 5
Apply design principles and the knowledge of fabric and notion selection to execute a structured design process in developing original garments	✓	–	–	–	–
Understand the application of lean methodology of learning to research and create effective and economical design solutions	✓	✓	✓	–	–
Learn and implement the basic process of apparel pre-production, from design concept through finished sample	✓	✓	✓	–	–
Demonstrate the ability to produce well-fitted garments through the appropriate implementation of pattern making and garment construction skills	✓	✓	✓	–	–
% Applicability of pedagogy	100	75	75	0	0

Table 7 Mapping of course learning outcomes to creative pedagogies

Fashion illustration					
Course learning outcomes	Creative pedagogy # 1	Creative pedagogy # 2	Creative pedagogy # 3	Creative pedagogy # 4	Creative pedagogy # 5
Draw the fashion figure and communicate apparel design details using a variety of media	✓	–	✓	–	–
Develop skills for effective visual communication using concept boards, technical design procedures and other presentation methods	✓	✓	✓	✓	–
Learn to analyze garment styles, fabric drapes and reproduce them to fit the fashion figure	✓	✓	–	✓	–
Understand the various types of fashion art, including advertising art, working drawings, flats, spec drawings and portfolio art	✓	–	–	–	–
Become familiar with fashion illustration styles of the past and present and develop a personal style of illustration and presentation techniques	✓	✓	✓	✓	–
% Applicability of pedagogy	100	60	60	60	0

Table 8 Mapping of course learning outcomes to creative pedagogies

Fashion merchandising					
Course learning outcomes	Creative pedagogy # 1	Creative pedagogy # 2	Creative pedagogy # 3	Creative pedagogy # 4	Creative pedagogy # 5
Understand the fashion merchandising industry in today's market	–	–	–	–	–
Document fashion merchandising resources, brands versus private labels	✓	✓	–	✓	–
Analyze the role of fashion media in predicting consumer buying trends	✓	✓	–	–	–
Interpret retailing formats and trends in retail growth and expansion	✓	✓	–	✓	–
Communicate the activities involved in preparing for and making fashion market buying trips	✓	✓	–	✓	–
% Applicability of pedagogy	80	80	0	60	0

Table 9 Mapping of course learning outcomes to creative pedagogies

Fashion studio II					
Course learning outcomes	Creative pedagogy # 1	Creative pedagogy # 2	Creative pedagogy # 3	Creative pedagogy # 4	Creative pedagogy # 5
Demonstrate the ability to construct garments using intermediate skill level patterns	–	✓	–	✓	–
Adapt the required skills to execute a project including selection of fabric, fit and construction techniques	✓	✓	✓	✓	–
Produce two types of made-to-measurement trousers with fly zipper, welt pocket, side pocket and elastic band by considering the different elements and defining the cost factor	✓	✓	✓	–	–
Construct a tailored jacket using interfacings, linings, shoulder pads and other techniques involved in producing this type of garment	✓	✓	✓	–	–
% Applicability of pedagogy	75	100	75	50	0

Table 10 Mapping of course learning outcomes to creative pedagogies

Patternmaking					
Course learning outcomes	Creative pedagogy # 1	Creative pedagogy # 2	Creative pedagogy # 3	Creative pedagogy # 4	Creative pedagogy # 5
Recognize and understand the various patternmaking tools and appropriate methods	–	–	–	–	–
Showcase the required skills to execute patterns with a tailor-made fit	–	✓	✓	–	–
Apply a specific patternmaking method and skills to solve a given design problem	✓	✓	✓	✓	–
Design and create patterns for two versions of made-to-measurement pants	✓	✓	✓	–	–
Create made-to-measurement blouse and dress patterns and exhibit advanced knowledge of different manipulations of collar and sleeve patterns	✓	✓	✓	✓	–
% Applicability of pedagogy	60	80	80	40	0

Table 11 Mapping of course learning outcomes to creative pedagogies

CAD for fashion design					
Course learning outcomes	Creative pedagogy # 1	Creative pedagogy # 2	Creative pedagogy # 3	Creative pedagogy # 4	Creative pedagogy # 5
Understand stages of development and components of a design portfolio	✓	✓	–	–	✓
Implement product development and creative techniques through appropriate software	✓	✓	✓	✓	✓
Development of garment collections incorporating illustrations, flats, and storyboards	✓	✓	✓	✓	✓
Recognize of the application of flat measurements and product specification incorporating industry standards	✓	✓	✓	✓	–
% Applicability of pedagogy	100	100	75	75	75

Table 12 Mapping of course learning outcomes to creative pedagogies

Fashion design by draping					
Course learning outcomes	Creative pedagogy # 1	Creative pedagogy # 2	Creative pedagogy # 3	Creative pedagogy # 4	Creative pedagogy # 5
Demonstrate the principles and process of draping muslin pieces on full-scale dress forms to develop: basic foundation patterns, design variations of the basic patterns, and advanced designs	✓	✓	–	–	✓
Articulate standards and specifications for evaluation of finished drapes	✓	✓	–	–	–
Use and experiment with the principles of draping to create new designs	✓	✓	✓	✓	✓
Evaluate and critique apparel designs in terms of the integration of materials, design lines, construction processes, and price point	✓	✓	✓	✓	✓
% Applicability of pedagogy	100	100	50	50	75

Table 13 Mapping of course learning outcomes to creative pedagogies

Capstone graduation project					
Course learning outcomes	Creative pedagogy # 1	Creative pedagogy # 2	Creative pedagogy # 3	Creative pedagogy # 4	Creative pedagogy # 5
Develop and implement a strategy for a design project	✓	✓	✓	✓	✓
Successfully execute and document an original design project from concept to completion	✓	✓	✓	✓	–
Demonstrate creativity, critical thinking and problem solving skills	✓	✓	✓	✓	✓
Interpret and analyze the findings of a design project from an industry perspective	✓	✓	✓	✓	–
% Applicability of pedagogy	100	100	100	100	50

5 Creative Pedagogies—Future Perspective

The research surveyed and identified creative pedagogies and how they could be applied to a fashion design curriculum in the United Arab Emirates for preparing future designers to tackle professional challenges in the dynamic world of design, in line with the country's vision of becoming the design destination in the region. The study included an in-depth review and exploration of several creative pedagogies and their applicability to fashion design education, an area with insufficient research and documentation.

Though the study was limited to the undergraduate Fashion Design program at American University in the Emirates, it provided insight about the connection between creative pedagogies and fashion design. The area of research may be expanded to include more universities within and outside the UAE. Since the use of creative pedagogies in fashion design is expected to enhance the learning of the students, the impact of the pedagogies could be examined after application.

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Modern Versus Traditional Assets Allocation Models on Imperfect Markets—Which One Is More Convenient for Investors?

Jelena Janjusevic 

Abstract

In an asset allocation problem, the investor seeks the combination of securities that best suit his needs in an uncertain environment. In order to determine the optimum allocation, the investor needs to model, estimate, and access and manage uncertainty. After a brief lull in literature on asset allocation, there have been considerable advances over the last fifty years. One of those responsible was Markowitz who presented the mean—variance approach (MV), as a modern and widely used tool on portfolio selection. However, MV assumes certain statistical performance of the stock markets which makes limitations for model application on small and emerging markets. Can MV or other modern assets allocation models assist investors on emerging markets in portfolio selection? How great errors investors are facing with in such cases? Would traditional 1/N allocation rule outperforms substantially the mean-variance portfolios?—questions are that this paper will try to answer. Research conducted 10 years ago, when standard MV approach was implemented on Montenegrin stock market and results obtained were compared with traditional 1/N approach, will be presented. The mean-variance optimal portfolios were constructed and overlooked measures of performance of this sophisticated strategy compared with the most naïve—1/N strategy. After 10 years since model was developed, author is in position to test the results in the real time. The main findings from the empirical datasets will be presented in this paper showing that emerging equity markets provide a challenge to existing models, however could be successfully applied using some extra features.

Keywords

Asset allocation • Modeling • Imperfect markets

1 Introduction

In about the 4th century, Rabbi Issac bar Aha proposed the following rule for asset allocation: “One should always divide his wealth into three parts: a third in land, a third in merchandise, and a third ready to hand” (Babylonian Talmud: Tractate Baba Mezi’a, folio 42a.)

Financial risk is a nuisance for the investor, but a potential source of income for the practitioner [1]. Finance has become a beautiful theory, with clean, though complicated, mathematical formulas that depend on some parameters. The values of these parameters are often taken for granted, but in most cases they have to be estimated. In financial applications it is often very desirable to know the future outcome of some uncertain variables [2]. A typical example is the return on a set of assets after a determined time step. Since it is in generally impossible to know exactly the future values of these returns, we model them as random variables, assigning them a suitable joint probability distribution [3]. In many cases, finding the exact analytical expression of the whole future joint probability distribution is too ambitious plan. Instead, we may only get (possible) accurate values for the first two moments of the joint distribution. In particular, as far as risk management is concerned, the most important quantity by far is the covariance matrix, called by practitioners the “risk matrix”.

In this work, we deal with asset allocation problems, i.e. how to allocate our capital between a set of disposable assets. There are many models and theories which offer solutions for making this decision. The most popular approach to asset allocation is the mean-variance framework pioneered by Markowitz, where the investor aims at maximizing the portfolio’s expected return for a given level of variance within a given set of investment constraints. Given a few assumptions, it is possible to estimate the market parameters that feed the model and then to solve the ensuing optimization problem [4]. This approach is highly intuitive. Paradoxically, this can be a drawback, in that one is tempted

J. Janjusevic (✉)
Heriot Watt University, Dubai Campus, Dubai, UAE
e-mail: jjanjusevic@hw.ac.uk

to rush to conclusions or to make implementations, without considering the underlying assumptions.

Implementation of this approach, nonetheless, requires knowledge of both the expected returns on all assets comprised in a portfolio and their covariance matrix; an information set which, by definition, is not available. A common way to circumvent this problem is therefore to use sample estimates of such measures in the optimization procedure (the so called plug-in approach). It follows that a prototypical investor is not only exposed to market risk, but also to estimation risk. Even if the true moments of the asset return distributions of a portfolio were known with certainty, MV optimized portfolios would not beat other portfolios in every future investment period, since return realizations usually differ from their expected values.

However, in computing the optimal asset allocation, there are some preconditions and statistical features that available data has to meet, particularly in terms of the existence of the normal distribution of data as well as adequate size of the time series that is going to be used in the model. Usually, markets in transition, such as Montenegrin capital market do not meet those criteria, questioning possibility of implementation of the MV approach and searching for other less advanced models. Our research questions that we are going to deal with in this paper are—Can MV or other modern assets allocation models assist investors on emerging markets in portfolio selection? How great errors investors are facing with in such cases? Would traditional 1/N allocation rule outperforms substantially the mean-variance portfolios?

Research initiated 10 years ago by author, when standard MV approach was implemented on Montenegrin stock market and results obtained were compared with traditional 1/N approach, will be presented. The mean-variance optimal portfolios were constructed and overlooked measures of performance of this sophisticated strategy compared with the most naïve—1/N strategy. Additionally, the results of the model developed 10 years ago, were tested and portfolio performance was analyzed, with goal to compare performance of the portfolios resulted from MV approach and 1/N approach, as well as performance of the relevant stock exchange index.

The research Hypothesis we are setting in this research is that *MV approach can be applied on emerging markets despite the lack of certain statistical performance of the stock markets this model assumes.*

This research presents an application of the standard MV approach to the Montenegrin market. In our implementation, we computed a risky asset mean-variance frontier, and, as a benchmark, we choose an equally weighted portfolio. In order to do this, we constructed mean-variance optimal portfolios, i.e. we implemented this strategy on weekly data from the Montenegrin stock exchanges and overlooked measures of performance of this strategy in terms of the

Sharpe Ratio and compared this sophisticated strategy with the most naïve—1/N strategy. We evaluated the performance of the MV portfolio over the last year period (52 weeks) with different estimating windows ($T = 90$, $T = 120$ and $T = 140$). We compared the out-of-sample performance of the rule allocating 1/N to that of the MV strategy using two performance criteria. These two criteria were: (i) the out-of-sample Sharpe Ratio of each asset-allocation strategy and (ii) the turnover for each portfolio strategy.

The out-of-sample simulation presented differences in average returns, risks, Sharpe ratios and turnovers for the three mean-variance portfolios—GMV, I and M for the different estimating windows (GMV—the global minimum variance portfolio, I—the intermediate return portfolio and M—the maximum expected return portfolio). The results of the model developed in Matlab software 10 year ago, was tested in real time, with aim to test portfolio performance in both cases (using MV and 1/N approaches) and which one will present better investment opportunity. Also, all was compared with the performance of the stock exchange official index.

2 The Data Set and Model Implementation

2.1 The Data Set

In this section, we will provide a description of the data used in our application. We used data from two Montenegrin Stock exchanges—NEX Montenegro and Montenegroberza. The total number of stocks at the outset was 340. We collected 4 years of weekly data corresponding to 200 weekly observations. Since the number of stocks on the Montenegrin capital market is higher than the number observed, we cannot obtain reliable estimates of mean variance inputs. This is because the capital market of Montenegro is relatively young and its “real” trade started in 2002 (when only a few stocks were traded) and 2003, which we took as the starting period for our analysis.

This estimation problem can be solved using a time series of daily data and then projecting estimates over the weekly investment horizon. This can easily be done under the assumption that returns follow a multivariate normal distribution, which is not a feature of the dataset. Another approach can be a twostep analysis: to choose optimal weights in terms of asset subclasses (industry classes or sectors) and then solve the mean-variance optimization problem within each subclass. This is suboptimal from a mathematical point of view, but can, in fact, provide much more meaningful results in practice, due to estimation errors.

The simplified solution we adopted is the following. Because of the level of development in the Montenegrin

capital market, many shares were very rarely traded in the analysed period. Considering this fact, we decided to decrease the number of shares included in the analysis, excluding all shares traded less than 30 times per year. Also, since some of the shares weren't traded each day, or each week, we decided to use the last price that shares were traded before the date. According to this and to secure analysis considerations, after selection, we were left with 47 shares.

The period taken into consideration was from 07/01/03 to the 31/10/06. We decided to use weekly data, obtained from daily data and converted in average, using E-views, in order to keep the mathematical framework simple. Nevertheless, we are aware that this came at a high cost in terms of estimation error. We had 200 observations, i.e. 199 observations, after calculating discrete returns. The statistical analysis of the time series of the Montenegrin capital market showed that almost each time series exhibit high expected returns as well as high volatility. In particular, our data exhibits the typical features of stock market data of emerging countries: lack of normality, correlation in the return series, heavy tails and volatility clusters. Moreover, almost all of the series have shown an increasing trend, and the trend line is very clear over recent years. This suggests a formulation of the asset allocation problem, taking into consideration higher moments of the stock distribution and using ad hoc models to forecast expected returns and co-variances.

2.2 Model Construction

The aim of this case is to evaluate a performance of a mean-variance strategy compared to the equally weighted strategy. In order to do this we constructed the mean-variance optimal portfolios, i.e. we implemented the MV strategy on weekly data from Montenegrin stock exchanges, overlooked measures of performance of this strategy in terms of Sharpe ratio and compared this sophisticated strategy with the most naïve—1/N strategy. We were evaluating the performance of the MV portfolio over last one year period (52 weeks) with different estimating windows ($T = 90$, $T = 120$ and $T = 140$).

The structure of the analysis is as follows. In Sect. 2.1, the classic MV portfolio optimization is presented as a problem of optimally allocating capital among risky assets. Section 2.2 details the mean—variance technique. Section 2.3 shows results obtained from our work, presenting the results of both—in-sample/out-of-sample analysis. Last Sect. (3) is comparing performance of portfolios developed using MV and 1/N technique, with portfolio created based on the structure of Montenegrin stock exchange index using real data from Montenegro stock exchange.

2.3 The Problem Statement

According to MV approach, an investor chooses a portfolio $\omega = [\omega_1, \omega_2, \dots, \omega_K]$, such that portfolio variance is minimized given a predetermined level m of expected return. Therefore the investor's problem, assuming no short-selling, may be summarized as follows [5]:

$$\begin{aligned} \min_{\omega} \quad & \omega \Sigma \omega' \\ \text{sub :} \quad & \omega \mu = m \\ & \omega \mathbf{1} = 1 \\ & \omega \geq 0 \end{aligned} \quad (1)$$

where μ is the $K \times 1$ vector of expected returns, Σ is the $K \times K$ variance-covariance matrix of returns, $\mathbf{1}$ the $K \times 1$ vector with all elements equal to 1. Thus, in each period, the investor trades off portfolio expected return with portfolio variance.

The inputs to the classical portfolio selection model, the expected return vector μ and the variance-covariance matrix Σ , are not known with certainty so they need to be estimated from sample data, exposing the asset allocation choice to estimation risk. The consequences of estimation risk on MV optimized portfolios are of three kinds:

- Low degree of diversification. MV portfolios often involve very extreme positions. In particular, as the number of assets grows, the weight on each single asset does not tend to zero as suggested by a naive notion of diversification;
- Sudden shifts in the allocation of the optimal weights along the efficient frontier, i.e., the composition of the optimal portfolio is very different for individuals that differ slightly in their attitude towards risk;
- High sensitivity of portfolio weights to small variations in expected returns. Since little changes in expected returns can completely alter the composition of MV optimal portfolios, while modification in the variance-covariance matrix have smaller impact, it follows that errors in the sample estimates of expected return have great bearing on allocation choices. Errors in variance estimates are in turn about twice as important as errors in covariance estimates.

As consequence, MV optimized efficient portfolios constructed using sampled means and sampled variance-covariance matrices from a given population can score badly once their performance is verified using out of sample data.

The other strategy we consider is the naïve 1/N asset-allocation rule, where 1/N is allocated to each of the N stocks available for investment. In the version

implemented here the investor constantly rebalances the portfolio in order to maintain the 1/N allocation over time. There are several reasons for studying the 1/N asset-allocation rule. One, it is easy to implement because it does not rely on estimation of moments of asset returns and or optimization. Two, despite the sophisticated theoretical models developed in the last fifty years and the advances in methods for estimating the parameters for these models, investors continue to use such simple allocation rules for allocating their wealth across assets [6].

We compare the out-of-sample performance of the rule allocating 1/N to that of MV strategy using two performance criteria. These two criteria are: (i) the out-of-sample Sharpe ratio of each asset-allocation strategy and (ii) the turnover for each portfolio strategy.

2.4 Model and Solution Methodology

In detail Markowitz mean-variance procedure requires:

1. Collecting T historical returns on a set of K asset classes, i.e. on investments such as stocks, bonds, real estate, or cash (in our implementation we used stock returns from Montenegrin capital market).
2. Computing sample means μ and the variance-covariance matrix Σ .
3. Finding optimal weights— ω for a set of Z mean-variance efficient portfolios. Target expected returns to solve the MV problem are fixed in the following way.

Let E_{r_M} be the higher, among assets, expected return and let $E_{r_{GMV}}$ the expected return on the global minimum variance portfolio. Then divide the range $(E_{r_{GMV}}, E_{r_M})$ in $Z - 1$ sub-intervals [5]:

$$\{E_{r_{GMV}}, E_{r_{GMV}} + \delta, \dots, E_{r_{GMV}} + (Z - 1) * \delta = E_{r_M}\} \quad (2)$$

$$\text{where } \delta = \frac{E_{r_M} - E_{r_{GMV}}}{Z - 1}$$

The portfolio whose expected return is $E_{r_{GMV}}$ is called portfolio with rank 1, while the one whose expected return is E_{r_M} is called portfolio with rank Z. Portfolios with intermediate expected return are then named accordingly.

4. For each rank j, $j = 1, \dots, Z$, computing the efficient frontier, solving the mean-variance optimization problem.

2.5 Results and Comments

In the following section, we present results of in-sample and out-of-sample simulations. Table 1 shows the input stocks in the model. We start our analysis by generating the mean-variance efficient frontier (see Fig. 1) for the first 90 observations, i.e., $T = 90$. We then perform a rolled-out sample simulation. The in-sample period is set equal to 90 periods. The out-of-sample period is kept fixed and equal to one year, or since we are dealing with weekly data, 52 weeks, with three estimation windows, $T = 90$, $T = 120$ and $T = 140$. Further details of these simulations will be given in the next sections where we describe the results obtained.

In-sample analysis. The results of the in-sample analysis are presented in Figs. 1 and 2. Figure 1 shows the mean-variance efficient frontier. The mean-variance efficient frontier is computed using a standard quadratic programming algorithm. Sample data is of length $T = 90$, which means that we took into consideration a certain time period, in this case 90 weeks, and calculated the efficient frontier and the mean-variance optimal weights. The time period for in sample analysis is called an estimation window. In one word, at one point in time, we are seeking to make an optimal decision about where to invest. For the chosen time series length, we calculated the expected returns and the variance covariance matrix.

The in-sample analysis relies on two estimation techniques. Firstly, we computed the efficient frontier and the optimal weights from the historical data series. Secondly, we used a shrinkage input data series. Figures 3 and 4 present the results of this analysis. Figure 1 displays the mean-variance efficient frontier. Let us focus on three specific portfolios on the mean-variance efficient frontier: GMV, I and M.

Figure 2 exhibits efficient portfolio weights generated in mean-variance settings.

In sample analysis using shrinkage input data. The next graphs and table present an in-sample analysis using shrinkage estimators.

Table 1 Three portfolios in the case of shrinkage and historical data

	GMV (%)	I (%)	M (%)
ERmvh	0.70	6.38	12.07
Ermvs	0.46	6.26	12.07
SDmvh	0.73	12.41	90.70
SDmvs	0.97	12.64	90.20

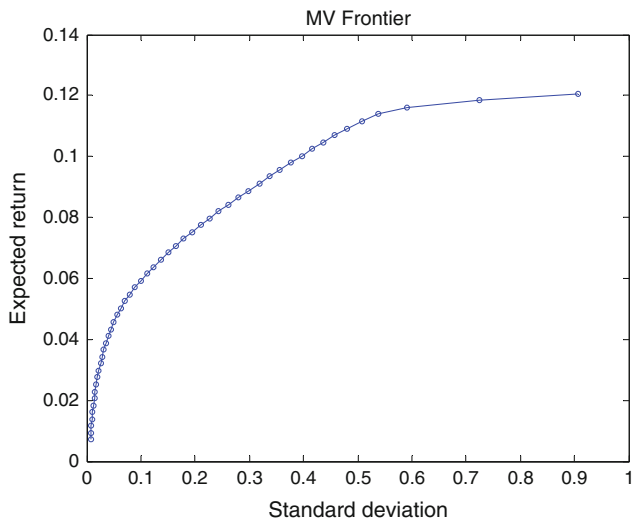
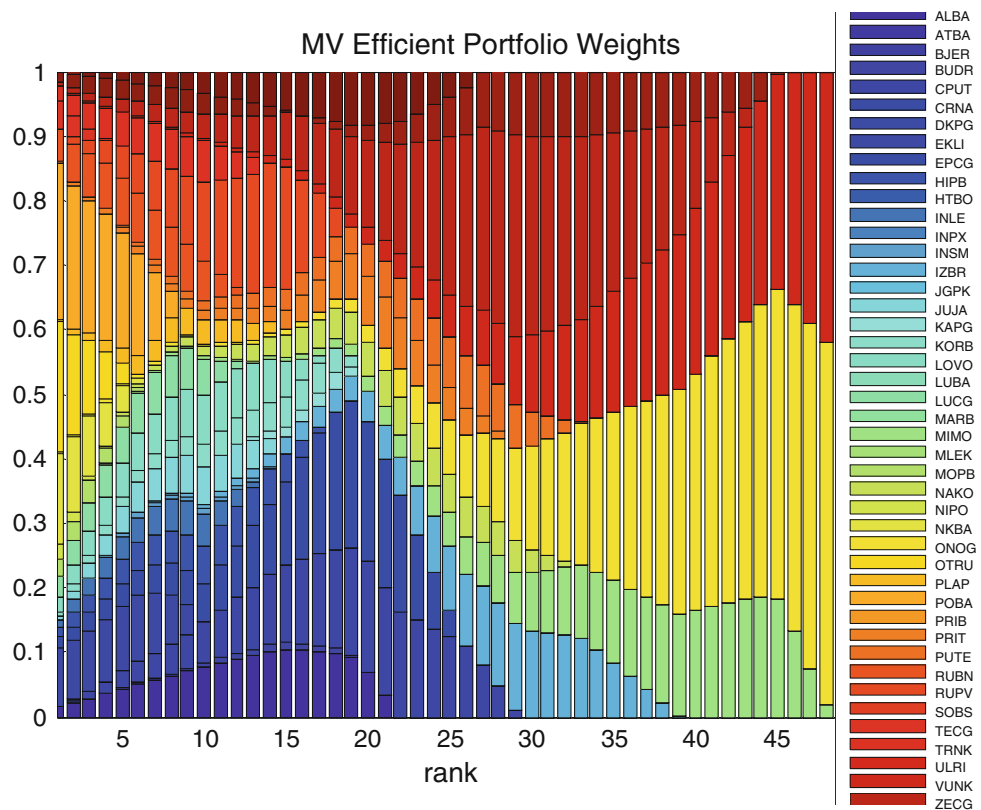


Fig. 1 MV efficient frontier

As we can see from the presented graphs and tables, optimal portfolio weights using the historical estimators only slightly differ from weights computed using shrinkage estimators for three chosen portfolios (GMV, I and M).

In the next table we present results of the in-sample analysis using historical and shrinkage estimators [5]:

Fig. 2 MV efficient portfolio weights



As shown, expected returns and standard deviations with historical returns are slightly different from those in shrinkage estimators. The difference exists only for the Global Minimum-Variance portfolio. Namely, the expected return on this portfolio, using historical data, is much higher in comparison to the same portfolio using shrinkage data, and, what is interesting, even if the expected return in the first case is higher, the risk is lower.

Out-of-sample simulation. In the previous section, we have illustrated how we calculated the efficient frontier and optimal portfolio weights at a given point in time. The analysis we conducted was based on an in-sample approach. We now move to an out-of-sample approach. How to choose the investment horizon and the length of the estimation window? If the investment horizon is equal to the estimation interval—use discreet returns!

Using data on the 47 asset classes, we implement a rolled out sample analysis. We choose an investment horizon of 52 weeks, or 1 year. Three simulations are performed. They differ for the size of the estimation period. Three different sampling lengths are considered:—90, 120 and 140 weeks. In each case, the out of sample period length remains the same: $T = 52$. Simulations are done considering three portfolios: GMV, Intermediate Return and Maximum (expected) Return portfolios. The optimal portfolios from each period

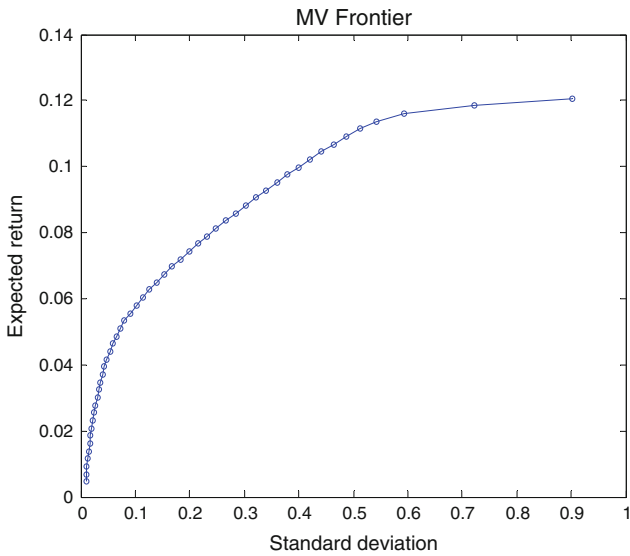
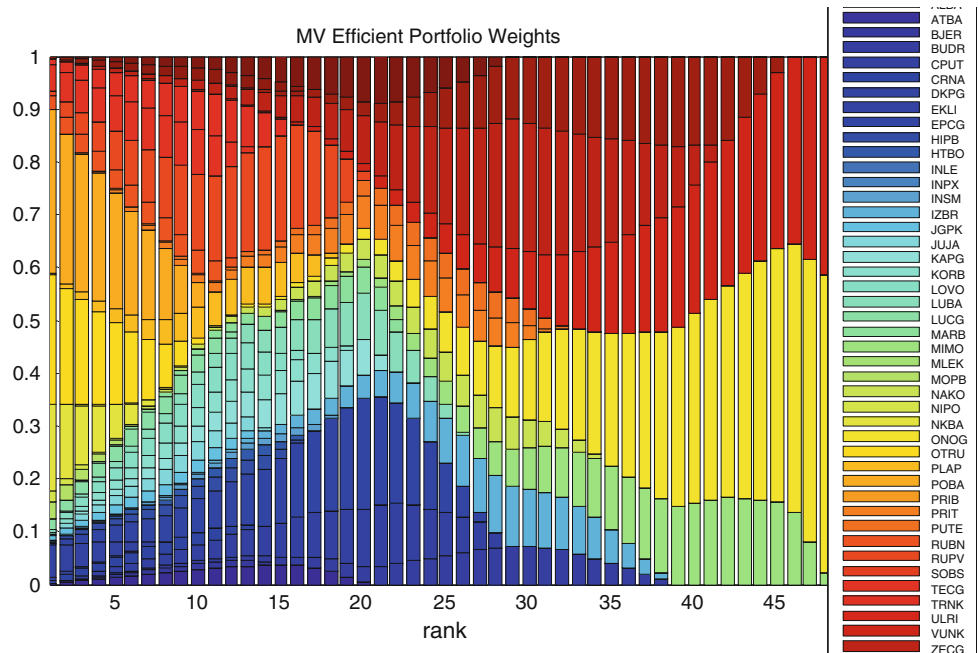


Fig. 3 MV efficient frontier (with shrinkage estimators)

are computed. The sample period is then moved forward one week and optimisation is repeated. Using the optimal weights computed for the previous period, together with the realised returns of stocks, the algorithm computes the realised returns generated by the optimal portfolios. Realised returns are then averaged across the out of sample period and normalised according to the average risk of the portfolio. In this way, a realised Sharpe Ratio (average) is computed for the cases of all three portfolios of the mean-variance strategy.

Fig. 4 MV efficient portfolio weights (with shrinkage)



The out of sample performance is summarised by the (average) realised Sharpe Ratios reported in Table 2. Results could depend on the following [5]:

1. By increasing sample size, estimation risk decreases and the quadratic programming procedure, it is more likely to produce portfolios that are real winners;
2. Sample period considered: in markets showing strong trends, like the one considered, assuming extreme positions can be highly rewarding.

In particular, we consider the (average) turnover of portfolios. This quantity measures the rate of trading activity across portfolio assets and, hence, it represents the percentage of the portfolio that is bought and sold in exchange for other assets. Namely, this measure is related to the level of transaction costs incurred during the implementation of the portfolio strategy, but it is important to realise that in the presence of transaction costs, it would no longer be optimal to implement the same portfolio strategy as that from the model without transactions costs.

There are several ways to calculate this quantity. Here, we adopt a simplifying approach. Turnover has been computed as the sum of absolute values of purchases and sales during a pre-set time period, divided by 2. This definition has a drawback in the case of equally weighted portfolios, as it hides the transaction costs incurred in rebalancing the current portfolio in order to keep constant weights (whilst relative prices change).

Let $\omega_i(t - 1)$ and $\omega_i(t)$ be K-dimensional column vectors representing portfolio weights at time $t - 1$ and t

Table 2 Sharpe ratio and turnover for mean-variance strategy

T = 90	Return	Risk	Sharpe ratio	Turnover
GMV	0.0019	0.0039	0.4924	0.0372
I	0.0201	0.0864	0.2328	0.0773
M	0.0327	0.7834	0.0418	0.1569
T = 120	Return	Risk	Sharpe ratio	Turnover
GMV	0.0014	0.0040	0.3497	0.0413
I	0.0144	0.1846	0.0778	0.0486
M	0.0236	1.2332	0.0191	0.0588
T = 140	Return	Risk	Sharpe ratio	Turnover
GMV	0.0044	0.0045	0.9893	0.0422
I	0.0248	0.2298	0.1081	0.0267
M	0.0213	1.3391	0.0159	0.0196

respectively. Then, the portfolio turnover from time $t - 1$ to time t , $T.O(t - 1, t)$, can be defined as:

$$T.O.(t - 1, t) = \frac{\sum_{i=1}^K |\omega_i(t - 1) - \omega_i(t)|}{2} \tag{3}$$

where $\omega_i(t)$ and $\omega_i(t - 1)$ indicate the weight of the generic asset class i at time $t - 1$ and t respectively.

For example, let us consider the case in which:

$$K = 2, \omega(t - 1) = \begin{bmatrix} 1 \\ 0 \end{bmatrix}, \omega(t) = \begin{bmatrix} 0 \\ 1 \end{bmatrix} \tag{4}$$

Therefore,

$$T.O.(t - 1) = \frac{|1 - 0| + |0 - 1|}{2} = 1 \tag{5}$$

i.e., a one hundred percent turnover moves from time $t - 1$ to time t . The turnover computing formula can be easily converted using the MATLAB code. Using the functions sum and abs, we can write:

$$TO = \text{sum}(\text{abs}(W_minus1 - W))/2.$$

This syntax has been used in SimulMv.m and SimulEw.m codes.

The next table presents the results of the out-of-sample analysis for the mean-variance strategy.

As we have already mentioned, a special part of our analysis is related to the construction of an equally weighted portfolio, and we will also see the Sharpe Ratio and turnover for this portfolio. Of course, by design, the turnover for EW portfolio is equal to zero ($TO = 0$). This is the case because

we kept the weights constant. Regarding the mean-variance strategy, where when considering 47 stocks, the weight of each stock in the portfolio will be 2.13%. The next table presents means, standard deviations and Sharpe Ratios of equally weighted portfolios (Table 3).

Next graph presents MV efficient frontier under historical and Shrinkage estimators (Fig. 5).

The out-of-sample simulation presents differences between the three mean-variance portfolios—GMV, I and M for the different estimating windows, in average returns, risks, Sharpe Ratios and turnover.

3 Comparison of the Portfolios and Their Performance 10 Years After Modeling

A comparison of the mean-variance portfolios and the equally weighted portfolio (1/N) can be done by considering both the out-of-sample performance, measured by the (average) realized Sharpe ratios. Our main finding from the empirical datasets is that the 1/N allocation rule outperforms substantially the mean-variance portfolios.

Other studies (see [5]), show that “the 1/N asset-allocation rule typically has a higher out-of-sample Sharpe ratio and a lower turnover than optimal asset allocation policies. The intuition for the poor performance of the policies from the optimizing models is that the gain from optimal diversification relative to naive diversification under the 1/N rule is typically smaller than the loss arising from having to use as inputs for the optimizing models parameters that are estimated with error rather than known precisely.

Table 3 Sharpe ratio and turnover for equally weighted portfolio [5]

EW	Return	Risk	Sharpe ratio
T = 90	0.0273	0.0421	0.6472
T = 120	0.0273	0.0463	0.5895
T = 140	0.0273	0.0488	0.5895

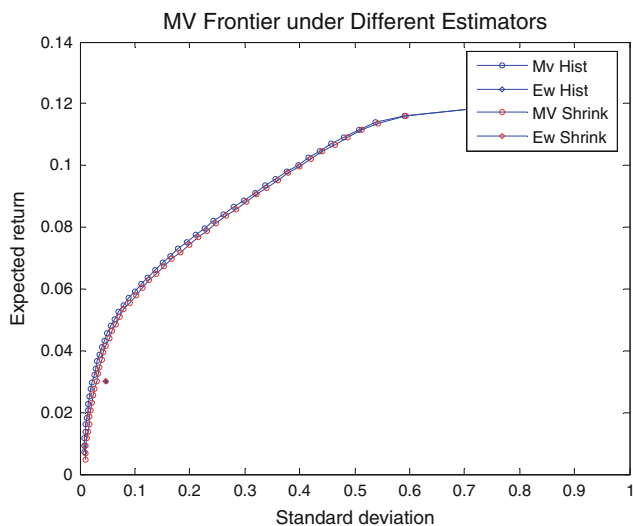


Fig. 5 MV frontier under different estimators [5]

Simulations show that the performance of optimal strategies relative to the 1/N rule improves with the length of the estimation window, which reduces estimation error". This is not at all evident in our findings.

Since EW portfolios always outperform significantly MV portfolios (except in GMV when $T = 140$, where the risk, as well as the expected return, is very low), the clear indication of our experiment is that MV analysis should be implemented with some extra features:

- Optimal use of available data: use of daily data and projection on weekly time horizon;
- Emerging markets exhibit high returns as well as high volatility. In particular, there is relatively high degree of predictability of emerging countries' returns (see [7]). Therefore, suitable forecasts should be used as inputs (for instance, relying on factor models or portfolio manager views in the Black-Littermann extended framework);
- Estimation error can be reduced also adding additional constraints to the optimization problem. In our example, we used Shrinkage estimator. We already mention that nonparametric estimators are suitable in the case of a very large number of observations and shrinkage estimators perform better when the amount of data available is limited. However, this did not helped much in our simulations;
- Choose optimal weights in terms of asset subclasses (industry, classes or sectors) and then solve the mean-variance optimization problem within each subclass, with additional constraints from security analysis.

Moreover, if, in some way, all theoretical approaches in asset allocation world are aimed at helping investors make optimal investment decision—with goal to achieve gains

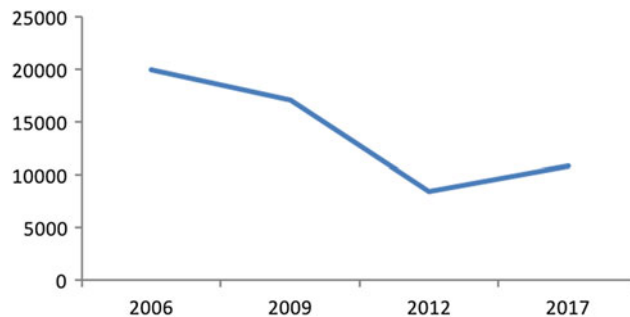


Fig. 6 Montenegro stock exchange index trend (Montenegroberza 2017) [8]

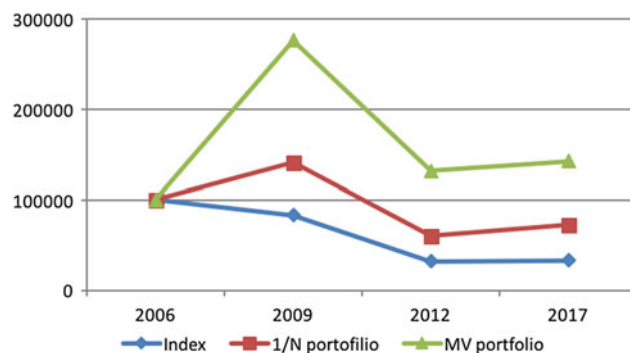


Fig. 7 MV, 1/N and index based portfolio trend

from their investments, the best way to test both approaches would be to "sit in investor's shoes", assuming that 10 year ago investor invested in both MV and 1/N portfolio. Furthermore, besides comparing results of these two portfolios and in order to have more realistic picture on the portfolios' performance having in mind market trends and level of development, we will compare each other with portfolio reflecting structure of Montenegrin stock exchange index as the best barometer of the capital market state.

Below are results of each portfolio.

Figure 6 present trend of Montenegrin stock exchange index. It is obvious that from 2006 Montenegrin capital market followed regression, which is important fact that has to be taken in consideration when evaluating portfolio performance (Fig. 7).

As visible from above graph, all three portfolios showed identical trends, increase in first years and then sharp decrease (this decrease reflect situation on the Montenegrin capital market which experience strong recession and fall in 2009), which from 2012 up to now has some constant trend. Difference is seen in volume of the trend. MV portfolio realized highest gains from 1 euro invested in it, followed by 1/N portfolio and index based portfolio as the one with the highest losses achieved. MV portfolio is the only one achieving gains all the time, while 1/N initially realized gains, but from 2009 its value decreased leaving potential

investor in losses. Portfolio which reflects structure of the stock exchange index constantly achieved negative financial result, which actually demonstrates that situation on the market was poor and that the market was in recession all the time, which in our case even strongly indicates importance of asset allocation strategies and models, as well as how useful those can be.

Of course, as shown in tables above and presented by Sharpe ratios, each return is accompanied by certain level of risk, which should not be ignored. Although MV portfolio, taking real time conditions and circumstances, obtained the highest gains for investors in our case, we should also take in consideration that graphs above presents GMV portfolio, which is the less risky among 47 portfolios we calculated in our analysis. All other portfolios performed much worse and some of those (line M portfolio) created significant losses for investors.

4 Conclusion

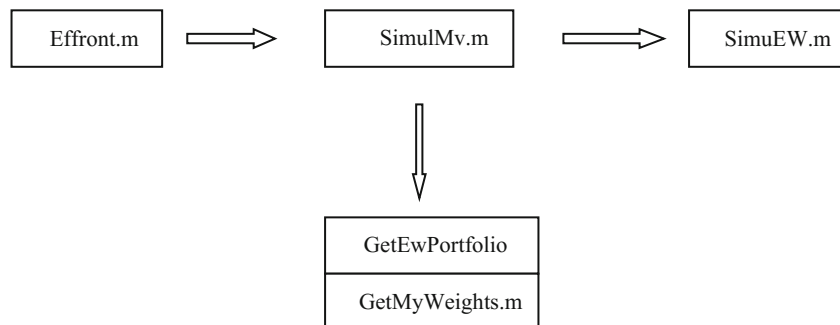
Emerging equity markets provide a challenge to existing models and beg the creation of new models [7]. While the

small and emerging markets, our analysis proved that results in portfolio selection obtained using MV approach can be reliable and assist investors on emerging markets in portfolio selection. Errors investors are facing with in such case are not lower compared to the ones from other models, such as traditional 1/N allocation rule or stock exchange index modeling rule. The research Hypothesis we set in this research, that MV approach can be applied on emerging markets despite the lack of certain statistical performance of the stock markets this model assumes was proved and confirmed.

Appendix 1. Implementation and Algorithm

In this Section we present the MATLAB functions used to perform the analysis and simulations. Functions used are:

- effront.m
- SimulMv.m
- SimuEW.m
- GetEwPortfolio
- GetMyWeights.m



data are not nearly as extensive, it is better for the empiricist to use what is available than to use nothing. Such work demands extensive robustness tests given the limited nature of the data. In this context, it is crucial to implement forecasting models for the inputs of the mean-variance optimization problem, reducing the estimation error by introducing additional constraints to the optimization problem and portfolio manager views from security analysis. Despite constraints, Markowitz allocation model method is widely used in practice. Almost all investment funds and bigger investors use this method or methods derived from it in asset allocation. This was confirmed by our analysis and measurement of the performance of the portfolio constructed using MV approach, as well as comparing it with other two constructed using 1/N and index modeling approach.

Although MV foundation lies on the certain statistical performance of the stock markets limiting its application on

Function `effront.m` computes the mean variance efficient frontier solving a standard quadratic programming problem. Weights, expected returns and standard deviations of a set of efficient portfolios are provided as outputs. Optimal portfolios satisfy the expected return ranking constraint, i.e. they are equally distant in term of expected return. A short selling constraint is also imposed.

Inputs:

ERassets = row vector of asset expected returns;

Varcov = variance-covariance matrix of asset returns;

NumPortf = number of efficient portfolios to be computed.

Outputs:

Wmv = NumAsset*NumPortf - matrix of efficient portfolio weights;

ERmv = column vector of efficient portfolio expected returns;

SDmv = column vector of efficient portfolio standard deviations.

Function SimulMv.m performs out of sample simulation evaluating mean variance efficiency. Efficiency is in terms of realized Sharpe ratio and portfolio turnover.

Inputs:

RetSeriesTotal = Ttotal*NumAssets matrix collecting return time series (total stands for in-sample plus out-of-sample period);

T = length of in-sample period used in rolling simulations;

NumPortf = number of portfolios considered in the simulation.

Outputs:

ARRmv = vector collecting average realized returns for mean variance portfolios;

ASDmv = vector collecting average realized risk for mean variance portfolios;

ASR = vector collecting average realized Sharpe ratios for mean variance portfolios;

ATO = vector collecting average turnovers for mean variance portfolios.

Function SimulEW.m performs out of sample simulation evaluating equally weighted efficiency. Efficiency is in terms of realized Sharpe ratio and portfolio turnover.

Inputs:

RetSeriesTotal - Ttotal*NumAssets matrix collecting return time series. Total stands for in-sample plus out-of-sample period;

T - length of in-sample period used in rolling simulations;

NumPortf - number of portfolios considered in the simulation.

Outputs:

ARRew - vector collecting average realized returns for equally weighted portfolios;

ASDew - vector collecting average realized risk for equally weighted portfolios;

ASR - vector collecting average realized Sharpe ratios for equally weighted portfolios.

Function GetEwPortfolio.m generate the equally weighted portfolio, which is used as a benchmark for the mean-variance portfolio.

Function GetMyWeights.m generates a matrix containing mean variance portfolio weights for the set of ranks specified in PortSet (row vector collecting the ranks we want to analyze).

Inputs:

Wmv = NumAsset*NumPortf matrix collecting mean-variance portfolio weights

PortSet = 1 x NumRanks, collecting the ranks we want to analyze

Output:

MyWeights = NumAssets x NumRanks, mean-variance weights in a matrix

In next few steps we will explain how we performed in-sample and out-of-sample analysis.

To perform in-sample analysis:

Load a price time series, data.mat, into the workspace. Data.mat need to be a $(T \times K)$ matrix, where T indicates the number of prices and K the number of assets. Prices in data.mat start from the oldest observation up to the more recent ones. Then we compute discrete returns series:

RetSeriesTotal = price2ret(data,[],'periodic')

Call function GetEfffront to generate mean variance efficient frontier

[Wmv, ERmv, SDmv] = GetEfffront(RetSeries, NumPortf, InputType);

call function GetMyWeights in order to extract mean-variance weights for three portfolios ranks (GMV, I, M).

MyWeights = GetMyWeights(Wmv,PortSet);

Call function GetEwPortfolio to generate the equally weighted portfolio.

[Wew,ERew,SDew] = GetEwPortfolio(RetSeries, InputType);

To perform out-of-sample simulation:

Choose estimating window and number of rolling optimization to be performed in out of sample analysis - NumRoll. We choose that NUmRoll = 52 and three estimating windows - T = 90, T = 120 and T = 140.

Call function SimulMv.m - this function will repeatedly call mean variance procedure looking the performance of this method and storing results period by period. Input data T indicates the time length of the in-sample period; where we choose three estimating windows - T = 90, T = 120 and T = 140.

[ARR,ASD,ASR,ATO] = SimulMv(RetSeries,T,NumPortf,InputType)

We call function GetMyTable.m which give us a table which elements are: Average Portfolio Return (ARR), Average Standard Deviation (ASD), Average Sharpe Ratio (ASR) and Average Turnover (ATO):

Table = [ARR ASD ASR ATO].

MyTable = GetMyTable(Table,PortSet).

We did the same out of sample analysis reference to equally weighted portfolio!

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Online Summative Assessment and Its Impact on Students' Academic Performance, Perception and Attitude Towards Online Exams: University of Sharjah Study Case

Hussein M. Elmehdi and Al-Mehdi Ibrahim

Abstract

In this paper we present the results of a study carried out at the University of Sharjah (UOS) over the past three semesters to evaluate the impact of online exams on the performance of students and examines student perceptions, attitude and feedback on online assessment in comparison to traditional in-class exams. The study (1493 respondents) aims to answer questions on effectiveness and impact of online assessment, especially those related to time management, preparation, reliability, fairness, security, grading, prompt feedback and possible impact on students' performance. The survey also aims at identifying possible risks associated with online assessment at the UOS. The results indicate that there is no clear indication of improvement in the overall class GPA or in the overall passing percentage of the class. Student's opinion and perception on online assessment seem to be divided among the 1493 students who responded to the online survey. More than half of the students preferred online exams over traditional paper-based exams. Students' opinion was more in favor of online exams in questions related to the added values and benefits of online exams, especially those related to logistics and improving teaching and learning. No age or gender biases were found in any of the areas investigated. The results of our study support the UOS's effort to integrate online summative assessments into teaching and learning, which will in turn improve the quality of education through accurate and fair assessment. UOS need to raise awareness among staff and students on the values of online

testing in improving course assessment and help facilitate testing logistics.

Keywords

Online summative assessment • Student performance • Education quality • Course outcomes

1 Introduction

In light of the latest technological advances and recent developments in higher education, postsecondary institutions are faced with a number of challenges [1]. At the forefront of these challenges is the utilization of Learning Management Systems (LMS) and the various tools and functionalities provides. Currently, LMS environment is limited to posting material and communicating with students. LMS tools and functionalities should be utilized in assessments and evaluation to enable linking course assessment to expected outcomes [2, 3, 4]. In addition, and with the increased demand on detailed analysis of achievements of various courses outcomes, LMS can contribute to this since it has tools that track and keep detailed stats of students' activities and interaction in any course component posted on the online course page. A second challenge facing higher institutions is the increased demand coming from accreditation boards that require detailed analysis of student performance; especially those related to achievement of course outcomes and course objective. These exercises can be rigorous and require tracking various activities and calculating students' achievements based on their performance on various assessment tools. A third challenge facing higher education institutions is the increase in education cost, which forces institutions to look into ways to reduce education cost without compromising the quality of the education these institutions deliver [4]. In the three listed challenges, technology has been viewed as it may provide the solution to some of the problems associate with these challenges. In

H. M. Elmehdi (✉)
Department of Applied Physics and Astronomy,
University of Sharjah, Sharjah, UAE
e-mail: hmelmehti@sharjah.ac.ae

A.-M. Ibrahim
Department of Mechanical and Manufacturing Engineering,
University of Manitoba, Winnipeg, Canada
e-mail: almehdi68@gmail.com

addition, researchers have identified the widespread and the exponential growth in the use of smart devices to have a great potential to help educators transform and improve educational methodologies and approaches including course assessment and evaluation [5]. In addition, in recent years the use of Internet in education has grown considerably. However, in many institutions in the region the use of the Internet is limited to providing access to students to course materials and communication with students. While there are many additional tools provided in LMS solutions, a typical course page is usually limited posting course outline, lecture PowerPoint slides, some instructional materials, and communicate assessments results over grade book [6].

In past two years, the University of Sharjah (UOS), United Arab Emirates, has included in its strategic plans expanding the use of LMS tools and functionalities to include online assessment and measuring achievement of course outcomes based on detailed analysis of students' performance in every assessment tool. This can be easily achievable by linking course objectives to assessment tools for every topic listed in the course outcomes. Technically, such tasks can be easily achieved with the recent web-based and user-friendly LMS systems and solutions that include assessment packages and secure Internet testing protocols. The latter led to increase in employing LMS solutions to conduct summative online assessment, including assignments, quizzes, and tests. Deans and administrative management at the University of Sharjah are enthusiastic about potential for conducting assessments (quizzes, midterms and final exams) using available LMS tools for summative assessment materials. This is mainly due to the various advantages employing online assessments systems bring, including saving time in grading, recording and producing statistical reports for feedback and program evaluation [7].

From our brief search in the literature, it seems that there is no clear consensus among researchers in the field on the impact of online exams using web-based assessment LMS tools on students' performance [8, 9]. In addition, little information has been found on the students' perception, acceptance and attitudes towards such online systems. In the UAE and Gulf Region, no studies have been found on this topic, which makes our study the first study that explores the impact of online exams on students' performance and gauges their attitudes and acceptance (or feelings) towards summative online assessment. This makes the objectives of this initial study to: (1) Conduct a statistical comparison between the performance of the students' summative (graded) assessment using the online web-based system vs. those assessed using traditional paper-pencil in class exams; (2) Gauge students' perception, possible advantages, disadvantages and the challenges faced when conducting assessment online via LMS systems. Our goal is to assess the

experience of the University of Sharjah with online summative assessment and provide feedback and recommendation to improve the experience and make sure that it serves the purposes it is intended for including improving the education quality through improving courses assessment that is based on expected course outcome. Implementation of such approaches will improve teaching and learning in large-size undergraduate classes through improved student confidence and increased instructional time.

2 University of Sharjah Online Summative Assessment

2.1 General

Before we present the details of our summative online testing, it should be noted that summative testing in an online testing environment that includes various types of course assessments, which were conducted and graded automatically through the LMS system. By definition, summative assessment generally takes place after completing a period of instruction and it requires students to answer questions or solve a set of problems that is based on the covered material to ensure learning outcomes are achieved [10]. The assessment (or the test papers) is graded and counted towards the final grade of the course. In contrast, in formative testing or assessment students are evaluated during the work process and the focus is on improving the process [10]. Online summative assessment process requires high levels of access and security controls that allow students to access and respond to questions through private and carefully generated passwords that are given to students with access limited to LMS testing environment only. In addition, the online summative system must be reliable to ensure accuracy, validity in scores and most importantly free of any technical errors and glitches. Additional security measures are taken by the technical supporting team to ensure that testing is done according to accreditation requirement and course outcomes and objective.

Some of the advantages of the online summative testing, which the University of Sharjah hopes to exploit include [11, 12]:

- Flexibility in delivering tests to students: Students can write the exams at different times of the day to fit their schedule. This will save the university the effort they endure in scheduling large-size classes in theaters and large exam halls. Less invigilators are needed since students have the option to write the test in computer labs available throughout campus.
- Efficiency in scoring, recording and reporting grades, which are done automatically via the LMS tools.

- Since the exams are conducted outside the class time, an additional benefit that can be gained by conducting exams online is the fact additional class time may be gained in traditional on-campus courses. That is, rather than taking a class period for completing the quiz or exam, instructors can use the class period for instructional delivery or other activities.
- Once the assessment questions are setup the first time, the material can be recycled again several times thereby saving instructors a lot of time and effort.

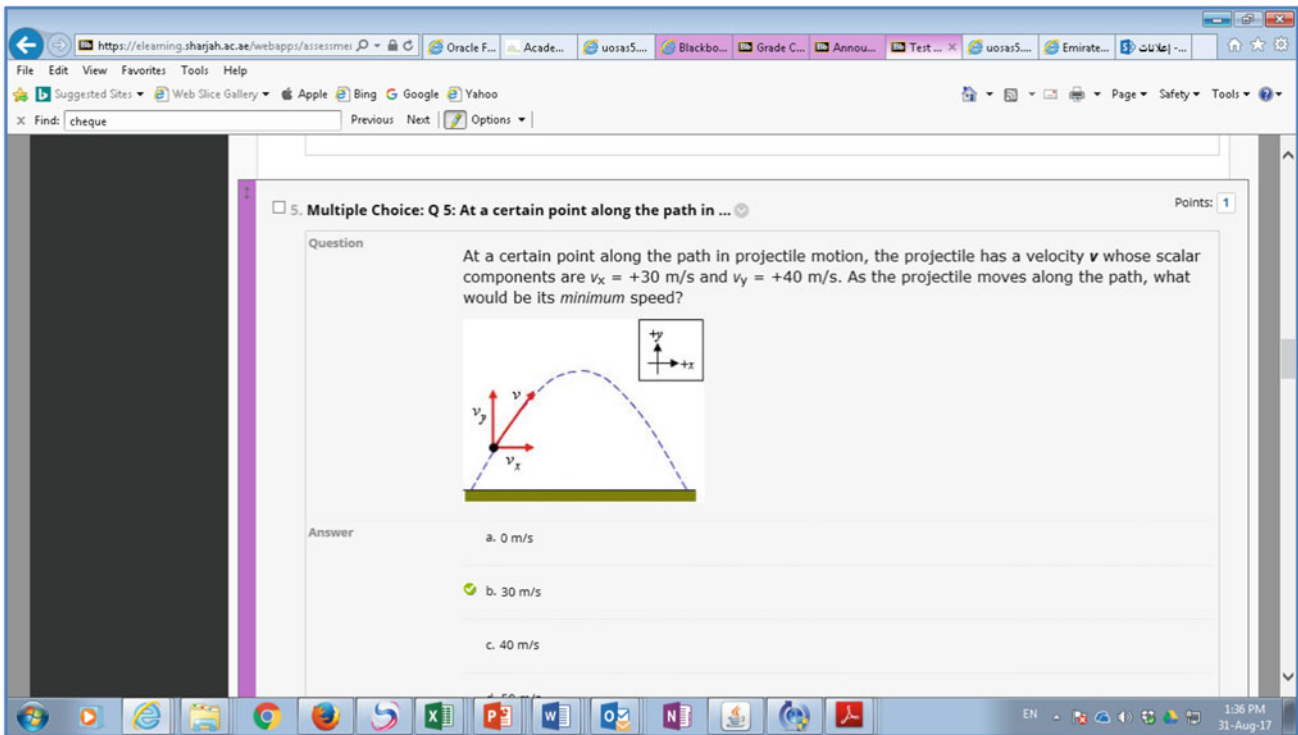


Fig. 1 Two screenshots of typical online exam questions

- Through technological solutions, cheating can be minimized, especially in MCQ type of exams. LMS testing tools provide randomization functionalities that allow instructors to make multiple versions of the exams so that students have no hopes of seeking assistance from peers sitting next to them. In addition, lock browsers' functions and applications were installed on the PC's to prevent students from consulting Google for answers.

While the above advantages were taken to support conducting quizzes and exams online, it should be noted that there are counter arguments that are not as supportive. For example, statistical analysis reported by Hollister et al. and Summers et al. have revealed that conducting exams online had no significant differences in mean exam scores for students [13, 14]. Hollister et al. also found significant variations in scores of unproctored online exams, which were attributed to possible increase in cheating. On students' satisfaction, Summers et al., reported that students were significantly less satisfied with the course than the traditional classroom students on several dimensions.

2.2 Exam Structure and Setup

As an initial phase, the University of Sharjah introduced online exams to large class sizes, which included university and colleges elective courses. The enrollment of such courses reaches as high as 2000 students. Traditionally, midterm and final examinations for these courses is a logistical nightmare for schedulers, instructors and departments. It involves an army of invigilators and making up several versions of MCQ exams that are photocopied and distributed in a very tedious process to ensure safety and security of the exams. Grading is usually done by hand, which usually requires a considerable amount of time to be finalized, double checked and approved.

Moving to online exams, course instructors were required to submit a bank of questions with various levels (easy, medium and hard) along with model (or correct) answers. The technical IT team uploaded these exams into the Blackboard under a separate course page. Multiple versions were prepared from the test bank with proper randomization parameters that ensures enough versions in specific setting (computer lab). A schedule of the exam halls timing and availability were sent to the students prior to the test date via the Blackboard. Screen shots of the exams for a number of courses are shown in Fig. 1. As mentioned above, students are given the option to sit in any of the announced times that fit their schedule. Invigilation was assigned to IT lab supervisors to ensure the availability of technical support when and if needed. Students were given time limit, which was set by the academic instructors. The number of attempts

was left open to students but once they submit, they cannot change their answers. Instructors were asked to conduct mock exams to ensure that students are well acquainted with the system functionalities. Student grades were recorded directly into the students' course evaluation worksheet.

The courses, which exams (Midterm or Final) were conducted online are listed in Table 1. It should be noted that while we have been monitoring the process for the Fall and Spring semesters, the analysis and results reported in this paper were conducted on the Spring 2017 cohort. The first trial (Fall 16/17) was somewhat an exploration of the system, especially from the logistical and technical aspects. The College of Sharia and Islamic Studies takes the credit for taking the initiative. The proposal was submitted to the Deanship of Academic Support Services (DASS) by the Sharia College Council as a solution to deal with the large classes, especially Islamic Culture, which is a compulsory university elective course that must be taken by students in all academic programs. In a typical semester, over 1500 students divided among 40 plus sections usually take the course. The experience proven to be successful providing the much needed help with invigilation, grading, recording, and reporting and course statistics. Building up on the success of the College of Sharia successful experience in the Fall 16/17 semester, more departments submitted requested to DASS to conduct their exams online.

3 Results and Discussion

3.1 Comparing Students' Grades: Online Versus Traditional

Before we present the results of the students' perception and satisfaction survey, we will present a comparison of the students' grades in one of the courses that was assessed using online summative approach and compare it to students' grades and class average in previous semesters when assessment was done using traditional paper-based. The purpose of the comparison is to look for possible effects on the overall grade distribution and class averages. An example of such comparison is shown in Figs. 2 and 3.

As highlighted in the legends in Figs. 2 and 3, Fall 15/16 and Spring 15/16 represent traditionally examined courses, while Fall 16/17 is the semester during which the students were examined using the online approach. Furthermore, the data presented in Figs. 2 and 3 represent the students' grades in Islamic Culture and Analytical Biography of the Prophet. Both of these courses are offered by the College of Sharia as University Elective Courses.

It is apparent for Figs. 2 and 3 that the grade distribution of the classes is comparable in both approaches, i.e. traditional paper and pencil exams versus online exams. The only

Table 1 The list of exams conducted online using Blackboard on exam tools

Semester	Departments	No of courses	No of sections	Total no of students
Spring 2017 (final exam)	Applied Physics, Arabic, English, Sharia	10	83	4431
Spring 2017 (midterm exam)		7	54	2021
Fall 2017 (final exam)	Sharia	3	46	1151
Fall 2017 (midterm exam)		3	42	1134

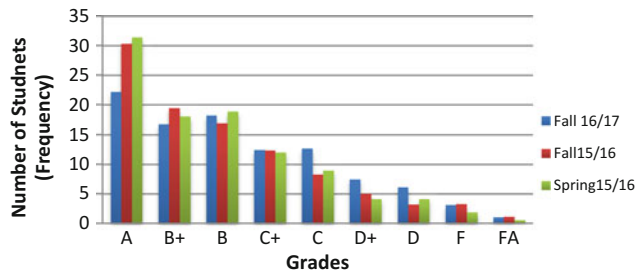


Fig. 2 The distribution of class grades (in Islamic Culture) using paper-based exams (Fall 15/16 and Spring 15/16) versus online exams (Spring 15/16)

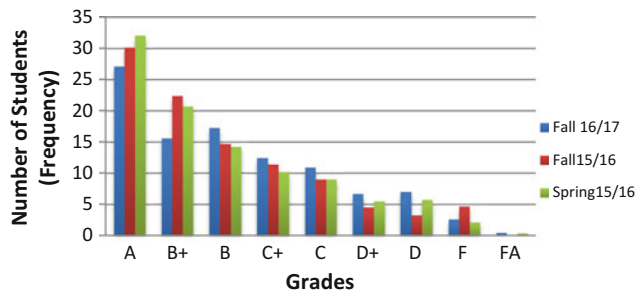


Fig. 3 The distribution of class grades (in and Analytical Biography of the Prophet) using paper-based exams (Fall 15/16 and Spring 15/16) versus online exams (Spring 15/16)

observable difference is in the number of A's, which seems to be lower for courses where the exams were held online. While we could not identify possible reasons for this noticeable difference, we have raised this with the Dean of the College of Sharia and the Department Chairman and they both agreed to monitor this for the next few semesters to make sure that it is a real effect. The passing percentage and the overall class averages are consistent throughout the three semesters. The clear conclusion that can be drawn from Figs. 2 and 3 is that the overall performance of the students did not change as a result of conducting the exams online. This is welcome news considering the many advantages the system provides including logistical, saving time in grading, efficiency in recording and reporting grades.

3.2 Assessing Student Perception of Online Summative Assessment

In this section of the paper, we present the second part of our study, which was conducted to gauge student perceptions of online summative assessment. An online questionnaire sent to students who took the online exams through the Blackboard LMS emailing tool. The questions included in the survey questionnaire were collected from various studies published in the literature [15, 16]. While the total number of students who took the online exams exceeded 5000 students, it should be noted that many of them are taking more than one course, which means that they could be were counted more than once. To avoid that, before performing the analysis, we have run a script to eliminate all duplicate answers.

Among these 5000 students 1493 students responded to the online survey, which is substantial number that should provide significant statistical results. The distribution of the students among the colleges and various courses is summarized in Tables 2 and 3. The selection of the classes was based on the available data for those who took the online

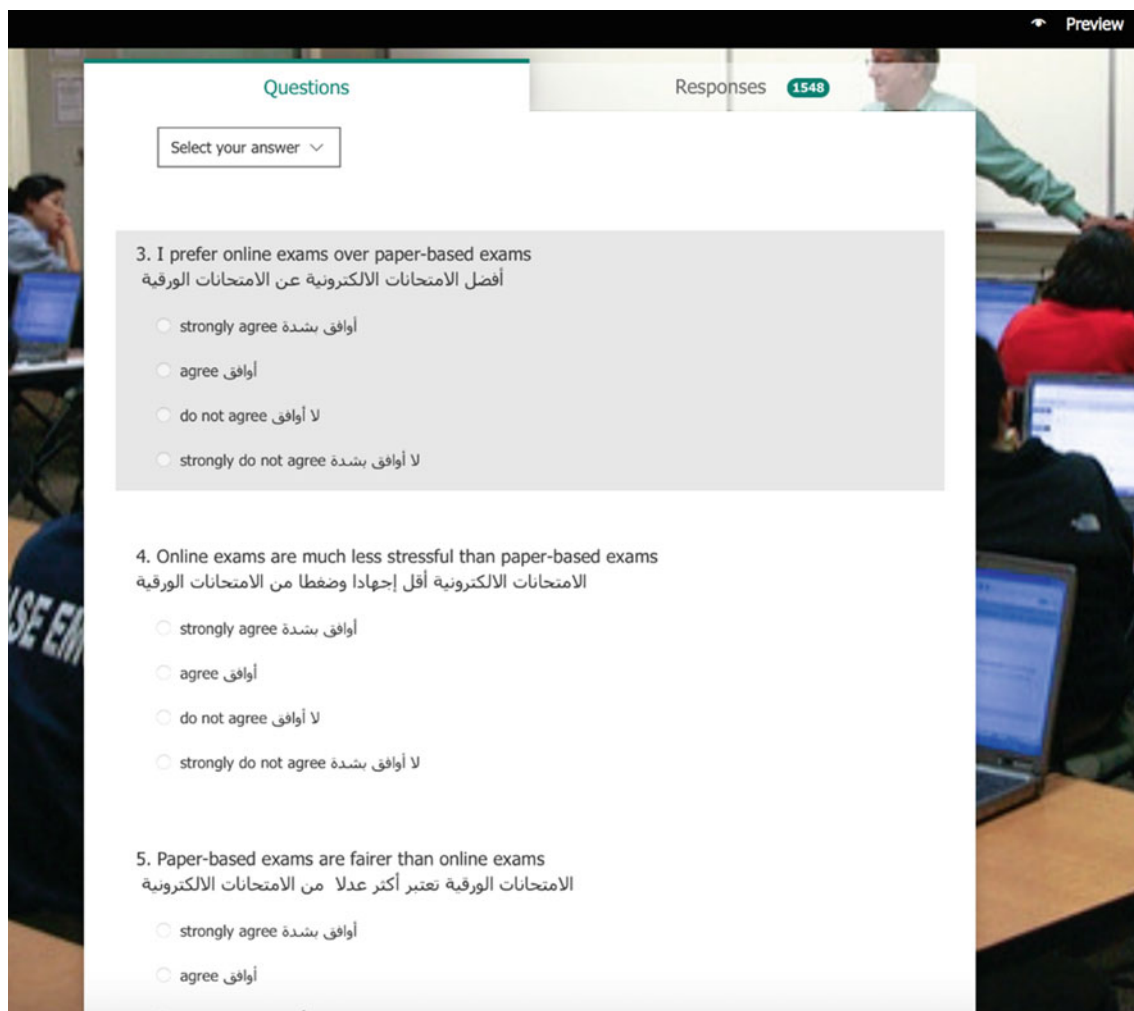
Table 2 The distribution of the students who took the online exams over the various colleges

College	Number of students
Arts and Humanities	131
Sciences	110
Communication	97
Bus Admin	109
Engineering	412
Health Sciences	191
Sharia	58
Pharmacy	88
Dentistry	67
Medicine	117
Law	64
Fine Arts	49
Total	1493

Table 3 The distribution of the students who took the online exams over the various courses

Course	Number of students
Basic English	118
English For Medical Sciences 1	136
Islamic Culture	373
English for Academic Purposes	140
English for Humanities	65
Arabic Language	276
Astro & Space Sciences	171
Analytical Biog of the Prophet	214
Total	1493

exam. In future studies, we plan to focus on specific subjects to limit the control factors. In addition to demographic questions, the questions in the survey focused on asking students about the effectiveness, validity, reliability and security of the online system, including technical issues. They survey also asked students questions about the fairness and the benefits that it can bring to teaching and learning. In addition, questions on the effectiveness of the approach and its impact on their academic performance with the aim of identifying possible risks associated with online assessment from the students prospective. Figure 4 shows sample of the questions, which were provided in both Arabic and English.

**Fig. 4** A screenshot of the questions included in the online students' satisfaction survey

To gauge the students' perception on the impact of online exams on their academic performance, subjects were asked if "immediate feedback will help me improve my learning experience". The results showed that 69% of respondents agreed with the statement. In a second question on the same category of questions, the students were asked if they felt "my marks will not be negatively affected by the Online Exams". Their responses showed that 56% of the students agreed with the statement. Responses were much higher in favor of technical advantages of online exams, especially in questions on accessibility (83% agreed), test reliability (81% in favor) and grading accuracy (84% agreed that grading in online is much more accurate than paper-based exams). Students felt the online exams were easy to navigate (79%) and user-friendly (87%). On the technical assessment questions of the survey, only 23% of the students reported experiencing technical issues during the exam. In addition, we have examined the data for possible gender gaps and there were no consistent visible differences in student responses among genders.

4 Conclusions

In the first part of this paper, we have presented the results of a study conducted at the University of Sharjah, United Arab Emirates, to study the impact of online exams on students' performance in comparison to paper-based exams. In the second part of the paper, we investigated the students' perception and attitudes towards taking exams online, with focus on a number of educational and behavioral factors.

The results of the first part of the investigation showed that students' performance was not affected by taking exams online. The grade distribution and the class passing percentage are consistent for both paper-based and online exams. The only noticeable difference is the slight decrease in the number of students who scored A's in online exams; an observation that needs to be further examined to ensure that it is real and the possible reasons behind it.

In the second part of the paper, the overall feeling and perception of the students towards online exams were investigated using an online survey questionnaire. While almost half the students enjoyed taking exams online, the majority of the students praised online exams when it came to fairness, security, grading and cheating possibilities. On stress and impact of their academic performance, slightly more than half of students reported positive impact on both dimensions. The latter is in line with the findings of other researches who have reported that students' satisfaction with online exams is low [13, 14].

The results indicate that there are challenges, including awareness among students, which need to be overcome before the University of Sharjah decides to adopt online summative

assessment. Our final conclusion can be summarized in the following statement: even though online summative assessment have proven to provide a number of logistical and academic advantages, the University of Sharjah needs to work on raising the awareness among staff and students to highlight these advantages and additional services. UOS needs to highlight that online assessment in principle should positively impact the performance of students through linking questions to expected course outcomes. Future studies will focus on investigating possible areas where the University should focus on to improve the experience.

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Risk Exposure, Liquidity and Bank Performance: New Evidence from the Recent Financial Crisis of 2007–2008

Miroslav Mateev[✉] and Petko Bachvarov[✉]

Abstract

In this paper, we examine the main determinants of stock return performance of 178 large and medium sized banks across the world, during the recent financial crisis of 2007–2008. We test the validity of various hypotheses advanced in the academic literature to address the question of why some banks performed so poorly during the crisis. Previous empirical analysis reports that the fragility of banks financed with short-term funds raised in capital markets, as well as the insufficient capital are among the factors that can explain the poor bank performance during the crisis. Our analysis brings new evidences in support of these arguments. We find that financial institutions with less deposits and loans, more liquid assets, lower return, lower ex-ante risk, and more funding fragility ahead of the crisis performed more poorly during the crisis. We investigate the impact of regulations on bank performance and find a strong correlation between restrictions on bank activities and bank stock return only in the sample of large banks. However, no systematic evidence exists that such restrictions made banks less risky before the crisis. Our main results hold up in a variety of robustness tests.

Keywords

Credit crisis • Risk taking • Bank fragility • Regulation • Ownership control

JEL Classification

G21 • G28 • G30 • G38

M. Mateev (✉)

American University in the Emirates, International Academic City, Dubai, UAE

e-mail: miroslav.mateev@ae.ae

P. Bachvarov

School of Management, University of Bath, Building 8 West, Quarry Road, Bath, UK

e-mail: petkobachvarov@gmail.com

1 Introduction

The financial meltdown that started initially in 2007 caused an excessive amount of losses among the majority of financial institutions throughout the world. Even more, some banks have seen their equity completely destroyed due to the large exposure to risk and bank runs. Specifically, large investment banks in the United States failed to meet their obligations and subsequently found themselves in insolvency. For instance, Lehman Brothers, one of the largest investment banks in America before 2007, entirely disappeared from the banking sector via bankruptcy. In addition, some of the financial institutions in America were taken over by their competitors to avoid any further potential collapse in the banking sector. A classic example could be the acquisition of Bear Stearns and Merrill Lynch by JP Morgan chase and Bank of America, respectively. It is also worth mentioning that other major investment banks in the U.S (i.e., Morgan Stanley and Goldman Sachs) were forced to transform into full service banks, because of a liquidity issue.

The empirical literature reports that lax regulation, insufficient capital, excessive reliance on short-term financing, and poor governance, were among the factors contributing to the financial crisis of 2007–2008. While some studies (see [1–3]) argue that poor governance was the main cause of the financial meltdown, others (see [4–6]) claimed that the heavy reliance on wholesale funding and non-interest activities affected the bank performance during the crisis. The general perception among researchers is that banks with poor governance had engaged in excessive risk taking, causing them to accumulate large losses during the crisis as these activities were riskier. If these factors did contribute to making the crisis worse, one should expect banks that were more exposed to these factors to perform more poorly during the crisis [5]. To test this hypothesis, we investigate the variation in the cross-section of stock returns of 178 large and medium sized banks across the world. Out

of these, 71 are large banks defined as banks with assets in excess of \$50 billion in 2006.

Some previous analyses emphasize that flaws in bank governance played a key role in the performance of banks [2]. If this is the case, one would expect banks with better governance to have performed better during the crisis. Our analysis does not support this argument. We find no significant relation between governance (as proxied by ownership of the controlling shareholder) and the performance of banks during the crisis. However, ownership was strongly correlated with bank risk taking before the crisis, that is, banks in which the controlling shareholder had a larger stake had lower distance to default. Prior research on the financial crisis of 2007–2008 emphasizes the run on the funding of banks that relied on short-term finance in the capital markets for a substantial fraction of their financing. Thus, one would expect banks that rely heavily on short-term finance before the crisis to perform worse during the crisis. We did not find strong evidence in support of this hypothesis. However, the evidence shows that funding fragility had significant and negative impact on bank performance even when we control in our regressions for regulatory and macroeconomic effects.

Numerous papers also pointed out that capital adequacy played an important role in making the crisis as serious as it was. For example, Demirgüç-Kunt et al. [7] report that capital was not the major cause of the crisis, but it became important, specifically for the largest banks, during the crisis. Our analysis shows the opposite; banks did not perform more poorly because of the lack of adequate capital. Another strand of literature (see [8, 9]) argues that regulators and supervision bodies failed in their efforts to strengthen the regulations on the excessive amount of risk taking and the heavy reliance on off-balance sheet products. Beltratti and Stulz [5] find that large banks from countries that had more restrictions on banks in 2006 fared better during the crisis, but no systematic evidence exists that such restrictions made banks less risky before the crisis.¹ We test this hypothesis for our sample of 178 banks and find positive correlation between bank restrictions and stock performance only in the sample of large banks. Furthermore, banks that come from countries with strong capital regulations and less private monitoring of bank activities also perform better during the crisis.

This paper contributes to the existing literature on bank crisis and bank risk taking in several ways. First, we extend the previous analysis of the financial crisis by testing the validity of several hypotheses advanced in the empirical literature. For example, no evidence exists that the crisis had

resulted from excessive risk taking which was made possible by poor governance; in opposite, we find a positive relation between ownership by the controlling shareholder and bank risk taking. Second, we investigate the impact of regulations on bank performance during the crisis. We find strong correlation between restrictions on bank activities and bank stock return only in the sample of large banks. However, no systematic evidence exists that such restrictions made banks less risky before the crisis. Finally, we provide new supportive evidence to the argument that banks that were rewarded with large stock returns in 2006 were actually the banks whose stock suffered the largest losses during the crisis. This finding holds equally for large banks and those with assets smaller than \$50 billion.

To check the robustness of our results we run several additional tests. For example, we use alternative measures of capital adequacy, income diversity and risk. In addition to the fixed- and random-effects models, the analysis employs identical specifications using GMM estimator, developed by Arellano and Bover [10]. This estimator controls for the presence of unobserved firm-specific effects and for the endogeneity of explanatory variables. The instruments used depend on the assumption made as to whether the variables are endogenous or predetermined, or exogenous. Instrument validity is tested using the Sargan test of overidentifying restrictions. Further, we estimate the determinants of bank performance after the crisis. Bank characteristics such as deposits, tangible equity and income diversity are important determinants of bank behavior after the crisis. We also investigate the relation between the post-crisis return and regulatory variables, and find that the index of official supervisory power and the restrictions on bank activities are strongly correlated with bank performance.

The paper proceeds as follows. In Sect. 2 we present the main finding of our analysis of the existing literature and formulate our hypotheses. In Sect. 3, we introduce the data set and the methodology that we use. In Sect. 4, we examine how the performance of banks during the crisis relates to bank-level characteristics, governance, regulation, and country characteristics other than regulation. We also show how these bank characteristics are related to bank risk taking activities. We conclude in Sect. 5.

2 Literature Review and Empirical Hypotheses

During the latest financial crisis of 2007–2008, substantial differences in banks performance and their risk exposure have been observed. Around the world, numerous financial institutions had witnessed a significant increase in their risk exposure, which by the end of 2008 resulted in destruction of their shareholders' equity. Moreover, the empirical

¹Because no evidence exists that these banks had less risk *ex ante*, banks with more restrictions on their activities could have had higher returns because they did not have the opportunity to diversify into activities that unexpectedly performed poorly during the crisis.

literature finds that some of the banks experienced an unexpected plunge in the market value of their assets (investment securities, reserves, loans, etc.).² Huizinga and Laeven [14] report a marginal decrease in the average Tier 1 ratio (declining from 12 to 11%) during the crisis. However, the study finds that market value of bank equity had dropped precipitously against a backdrop of virtually constant book capital. This finding confirms that declines in the reported bank capital understate the deterioration of the financial institutions' assets during the crisis. Another strong argument related to the recent collapse of the financial sector emphasizes on fact that a large proportion of banks faced the problem known as "maturity mismatch." This is the situation where banks are unable to cover their short-term liabilities with short-term assets. In other words, the bank assets were considered as illiquid. Moreover, prior research provides convincing evidences that these banks kept their capital and reserves low before the crisis, which later resulted in bank insolvency. These banks were not capable of recovering from the well-known bank runs. Due to illiquidity problem banks failed to meet some of their promised repayment obligations.

Prior literature reports several key factors to have a strong impact on the performance of banks during the financial crisis of 2007–2008. Academics, journalists, professionals and bankers have argued that lax regulation, insufficient capital, excessive reliance on short-term financing, and poor governance all contributed to making the crisis as serious as it was. If these factors did contribute to making the crisis worse, we should expect banks that were more exposed to these factors to perform more poorly during the crisis. To address this puzzle, we test several hypotheses related to bank performance and risk-taking activities. These are shortly discussed below.

2.1 The Impact of Short-Term Funding

There is considerable amount of empirical work focusing on the impact of short-term funding and noninterest income on banks performance during the crisis. For example, Adrian and Shin [4] show that the balance sheets of financial institutions are directly adjusted when there is a change in their asset prices. The reason is that their balance sheets are constantly marketed to market, which means the asset price changes show up immediately as changes in the net worth of these banks. Moreover, they report that the net assets of financial institutions are particularly sensitive to fluctuations

in asset prices given the highly leverage nature of the balance sheets of such institutions. In response to increases in prices of banks' assets, leverage falls and they hold surplus capital. For such surplus capacity to be utilized, the financial institutions must expand their balance sheets. On the liability site, they take on more short-term debt.³

Theory provides conflicting predictions about a bank's optimal asset or activity mix, its optimal financing, and the optimal match between bank assets and liabilities. References [15, 16] report that banks are able to optimally combine different types of activities, for example, loan making with securities underwriting. Hence, it could be expected that by combining various types of activities such as "non-interest" and "interest-based", banks could increase return and diversify risks, therefore boosting their performance [6]. However, the optimal size and the scope of these activities reflect diverse finance-specific technologies and possible agency problems that arise within the institutions if they become too complex [17, 18]. Hence, even if further diversification into different activities might not be optimal in terms of the overall risk-return trade-off the institution faces, insiders could still support this diversification as long as it enhances their ability to extract private benefits, which are sufficiently large. Therefore, diversifying into more liquid non-traditional banking activities such as trading activities that generate noninterest income, could end up increasing bank fragility and reducing the overall performance. As a result, banks that greatly relied on non-interest activities and short-term funding in the capital markets found themselves in a distress position during the latest financial crisis [6, 19].

Empirical evidence shows that a sizable proportion of banks attract most of their short-term funding in the form of non-deposits before and during the crisis.⁴ As a result, banks have significantly enhanced their funding fragility.⁵ Demirgüç-Kunt and Huizinga [6] argue that both deposit and non-deposit funding tend to carry different risks in causing a

²Both [11] and [12] claim that one of the reasons to have such a decrease in bank assets is related to the so-called "asymmetric information" problem as proposed by Akerlof [13].

³Adrian and Shin [4] test the response of the financial institutions to possible changes in their net worth and find a positive relation between changes in leverage and changes in balance sheet size, rather than the expected negative one. They conclude that financial institutions adjusting their balance sheet actively end up with high leverage position during booms and low during busts. Their conclusion is that the leverage is procyclical.

⁴Rogers [20] argues that banks have taken part in the so-called noninterest activities for a considerable time. Nonetheless, these activities are considered as non-traditional operations of banks. The "traditional" model is known as originate-to-hold. In this model, banks use the money they obtained from outside depositors to fund loans and return the money to the owners after the maturity period elapsed.

⁵Folkerts-Landau and Lindgren [21] propose that the introduction of insurance in the banking system could reduce the fragility of banks. However, Refs. [22, 23] argue that the excessive reliance on deposit insurance could affect bank stability. In other words, insurance can encourage banks to raise their exposure to liquidity risk.

potential liquidity problem, through a bank run or a sudden halting of “wholesale funding.” Huang and Ratnovski [24] develop a model of the so-called “dark side” of relying on wholesale finance in that the wholesale financiers could have the incentive to withdraw funding, thereby causing solvent financial institutions to fail. However, it should be noted that the financiers’ decision is based on signals of the quality of bank assets.⁶ Huang and Ratnovski [24] define these signals as “noisy and public.” The conclusion is that banking strategies that rely prominently on generating non-interest income or attracting non-deposit funding are very risky, consistent with the demise of the US investment banking sector during the recent financial crisis. Therefore, we would expect banks that rely heavily on short-term finance before the crisis to perform worse during the crisis. In line with this argument, we test the following hypothesis:

H1: Bank performance should be strongly and negatively related to different measures of short-term funding.

2.2 Bank Governance and Risk Taking

Empirical research suggests that ownership structure effected the performance of many banks during the crisis. For example, John et al. [27] argue that risk taking by corporations is primarily influenced by the ownership structure. In other words, shareholders with high power participate in risky projects (i.e., taking private benefits, investing in negative net present value projects), which in turn decreases the overall return of banks [18, 27]. Studying non-financial firms, Agrawal and Mandelker [28] find an inverse relation between risk taking and the degree of managerial control, while John et al. [27] find that managers enjoying large private benefits of control select sub-optimally conservative investment strategies. A study by Saunders et al. [29] finds that bank ownership control is positively correlated with the excessive risk taking, that is, owners-controlled banks exhibit higher risk-taking behavior than banks controlled by managers with small shareholdings. They do not, however, test whether ownership structure and regulations jointly shape bank risk taking, or whether their results generalize beyond the United States to countries with different laws and regulations.

More recently, Laeven and Levine [30] empirically estimate different aspects of bank management such as bank risk taking, the structure of ownership, and national bank regulations. They find that banks with more powerful owners

tend to take greater risks since owners with greater power and significant holding of cash flows have enough influence on bank managers to convince them to increase risk taking. Same study argues that equity holders have greater motivation to raise risk than outside investors and debtholders. The reason is that through the increase of risk managers generate higher return. Therefore, they will have the stimulus to enlarge the risk exposure to maximize their profit. However, there are some negative consequences of using this strategy. For example, Rajan [31] reports that the majority of managers are making higher profit by taking an excessive amount of risk, not by minimizing the latter as they claim. His study also indicates that the probability of having higher profit by taking an extreme risk is significant, but the probability of default is also significant.

Prior research (see [1, 2]) finds that banks with poor governance had engaged in excessive risk taking, causing them to accumulate large losses during the recent financial crisis. These banks were riskier compared to others with better governance control. There are two possible explanations of this finding. The first one is related to the level of ownership of the controlling shareholder. To the extent that governance played a role, one would expect banks with better governance to have performed better. It is generally accepted that greater ownership by insiders aligns their incentives more closely with the interests of shareholders. However, a powerful controlling shareholder could use the control of a bank to benefit other related entities, so that it is not necessarily the case that greater ownership by the controlling shareholder means better alignment of interests of management with shareholders. In line with this argument, we test the following hypothesis:

H2: Banks with higher ownership by the controlling shareholder should perform better during the crisis.

The second argument is related to the extent to which a board was shareholder friendly in the period before the crisis. Beltratti and Stulz [5] find that a strong and unambiguous relation exists between the extent to which a board was shareholder friendly in 2006 and the bank performance during the crisis, that is, banks with a shareholder-friendly board performed worse during the crisis. However, the hypothesis that the crisis resulted from excessive risk taking made possible by poor governance would imply the opposite result, so the evidence is mixed.⁷ To address this puzzling issue by testing the following hypothesis:

⁶Myers and Majluf [25, Ross 26] were the pioneers of signaling theory. They claim that signals could affect the firm value due to the presence of asymmetric information.

⁷Bebchuk and Spamann [1] argue that the weak features of the corporate governance played an utmost role in the performance of banks during the recent financial turmoil. The study also emphasizes that “executive compensation arrangements” could have influenced the immoderate risk taking. This means managers had incentives to take an excessive amount of risk in order to raise their compensation.

H3: Banks with higher controlling shareholder ownership are riskier (that is, having greater idiosyncratic risk and/or lower distance to default) before the crisis.

2.3 The Influence of Regulations

Previous studies report that ineffective regulation is one of the factors influencing the banks performance during the crisis [5, 32]. The general assumption is that lax regulation caused the large losses accumulated by banks during the recent financial crisis. Levine [9] strongly accused the regulatory system for being “blind” during the recent financial crisis. He also claims that the regulatory agencies deliberately avoided the extreme risk taking, which afterwards significantly contributed to the collapse of the financial sector. What is more, “the crisis did not just happen” but it was primarily due to the irresponsibility and the lack of adequate resolutions from the regulators. In other words, policymakers and regulators helped to make the crisis as destructive as it was [9].

Dam [8] investigated factors that are to be considered main causes of the so-called “regulatory failure”, and showed that credit-rating agencies were also part of the regulatory problem. The reason is that these credit rating agencies provided inadequate ratings to the top “tranches” of the complex products such as mortgage-backed securities, SIV, etc. Specifically, Moody’s, Standard and Poor’s, and Fitch rated most of the above-mentioned products as AAA, which turned to be wrong as these products proved to be significantly risky [33].⁸ Another key factor known to play a significant role in explaining the performance of bank during the recent crisis was the capital adequacy [36]. The liquidity problem in the banking system is considered as one of the major causes of the crisis as there have been little legal initiatives by authorities to deal with this problem over the years. More specifically, liquidity problem was closely related to diversification of the risk, an issue which was not deeply taken into consideration by the regulatory institutions during the last financial crisis.

Prior literature also emphasizes the importance of issues such as “moral hazard”, the disinclination and incapacity of banks to limit irrational abundance of leverage, and the failure of restraining the monopoly power of large banks, all of them being unsuccessfully mitigated by the regulators [37]. Overall, researchers and academicians conclude that regulation failure was one of the main causes of the financial crisis [8, 9, 37, 38]. In a similar study of 503 bank from 32 countries, Beltratti and Stulz [5] find no convincing evidence

that tighter regulation in general was associated with better bank performance during the crisis or with less risky banks before the crisis. However, they find that large banks that come from countries with more restrictions on bank activities in 2006 fared better during the crisis. We further investigate the relationship between regulations and stock return performance using a sample of 178 large and medium sized banks and test the following hypothesis:

H4: Banks from countries with stronger regulations on bank activities would perform better during the crisis.

2.4 Capital Adequacy

It is well known that bank capital position is significantly important because of its ability to absorb shocks, and to withstand any bank runs or liquidity problems [39]. Therefore, we may expect that a sudden negative shock will not affect significantly the “better-capitalized” banks. Demirgüç-Kunt et al. [36] find that before the crisis, differences in capital did not have much impact on stock returns; however, during the crisis, a stronger capital position was associated with better stock market performance, most markedly for larger banks. These are the banks of greater systemic importance, as well as those holding lesser quality capital at the inception of the crisis. Numerous other studies also find that capital was an important aspect of the bank stability during the recent financial crisis (see [7, 40, 41]). However, no systematic evidence exists that capital position before the crisis had a major impact on bank performance during the crisis. In line with this, we argue that banks with adequate capital before the crisis should not experience a large decrease in their equity return during the crisis. These expectations are in line with the findings of some previous studies (see [5, 36, 30]). To better address this issue, we test the following hypothesis:

H5: There is a significant and positive relation between stock performance and a bank’s capital position.

3 Data Set and Methodology

3.1 Sample Selection

Our sample includes financial institutions from 33 countries across the globe. Data on European banks and those from the rest of the world are extracted from Bankscope database. Our choice of banks is dictated by the following two factors: (1) data availability, and (2) sample that represents both

⁸See Refs. [7, 34, 35] for an additional overview of this issue.

small, medium and large banks from different countries around the globe. We exclude all financial institutions that are not publicly traded, all banks in insolvency during 2007–2008, and the institutions for which the data appear incomplete. The resulting sample includes 178 financial institutions (137 from Europe and 41 from the rest of the World).

For the main sample of our analysis, we require that a financial institution is a deposit-taking and loan-making bank. The regulation indices we use in this paper apply to such institutions, but they do not apply to institutions that are not subject to the Basel Accords. For a financial institution to be included in the sample as a deposit-taking bank, we require a deposit to assets ratio larger than 20% and a loan to assets ratio above 10%. With these restrictions, our data set has 102 deposit-taking banks (banks hereafter). Out of these, 71 banks have total assets in excess of \$50 billion; we notify this sample as large banks. It is important to mention that our sample is unbalanced due to data limitation.⁹ Tables 1 and 2 describe the data as well as the performance measures used in the analysis. Specifically, Table 1 reports country characteristics, and Table 2 includes data for our sample banks before (2005–2006) and during the financial crisis (2007–2008). We winsorize the bank-level explanatory variables at the 1 and 99% levels. While large banks are mostly concentrated in the US, several other countries in the sample have no large banks (see Table 1).

3.2 Sample Characteristics

3.2.1 Bank Equity Returns

Our performance measure is a bank's holding period return (HPR), computed based on the data available in Bloomberg and DataStream. Our main focus is on bank returns from the beginning of 2007 to the end of 2008 (crisis period hereafter). We also compute the return for the pre-crisis period (2005–2006). Not surprisingly, the average return for the crisis period is very poor at -26.18% . The standard deviation of this return is very high (39.93%). These results contrast sharply with the average return in the pre-crisis period of 26.11% .

3.2.2 Bank-Level Characteristics

Our analysis investigates to what extent the characteristics of a bank's balance sheets and income statements before the crisis can explain bank performance during the crisis. We would expect banks with better characteristics in the

pre-crisis period to perform better during the crisis period. We select bank characteristics that represent key financial ratios such as capital ratios, liquidity ratios, asset quality ratios, and profitability ratios. Our choice of variables is based on the findings of previous empirical studies and is partly dictated by data availability.

We use four different variables to capture the capital ratios of banks: (1) *Tier 1*, defined as the ratio of Tier 1 capital to total risk-weighted assets; (2) *tangible equity*, defined as the ratio of tangible equity to total assets; (3) *other capital* divided by the total assets, where other capital is calculated by subtracting common equity from total capital; and (4) *other capital* divided by the risk-weighted assets, where other capital is calculated by subtracting common equity from total capital.¹⁰ The average Tier 1 capital is 8.73% of risk-weighted assets in our sample, which is more than twice the Basel I requirement. While the lowest value of the Tier 1 ratio exceeds the Basel I requirement, the tangible equity ratio has a much lower minimum of 0.87% . Everything else equal, we would expect bank stock return to be positively related to capital ratios because a bank with more capital would suffer less from the debt overhang problem [42], and would have more flexibility to respond to adverse shocks. When we compare the pre-crisis with the crisis period, we observe that capital ratios do not change significantly.

To capture the composition of a bank's liabilities we use *deposit*, which is defined as ratio of bank deposits to total assets. Deposit financing is not subject to runs with deposit insurance, but money market funding is subject to runs [43]. Therefore, we would expect banks with more deposits-based funding and less financial fragility to have performed better during the crisis. The range of deposit is quite wide, as the lowest value is 21.84% and the highest value is 91.04% . We observe quite similar distribution for pre-crisis and crisis periods (see Table 2). Following [6], we estimate *funding fragility* as deposits from other banks, other deposits, and short term borrowing as a fraction of total deposits plus money market and short-term funding. Funding fragility has a median of 21.64% and a standard deviation of 17.21% (crisis period).

We use several key variables to represent the asset side of the bank's balance sheet. Following [5] reasoning, we compute the following ratios: (1) *loans* defined as the ratio of loans to total assets, (2) *other earning assets*, which is the ratio of derivatives and other securities to loans plus other earning assets, (3) *liquid assets*, which we define as the ratio of liquid assets to total assets, (4) *non-interest income* as a fraction of total operating income, and (5) *income diversity*,

⁹Some of the largest banks are subject to data limitation; for example, Deutsche Bank has no complete data available in Bankscope before 2005.

¹⁰Capital measures and other explanatory variables are explained in Appendix.

Table 1 Country characteristics

Countries	Number of banks	Number of large banks	Log (GDP) per capita	Current account	GDP growth	Inflation	Institution	Official	Capital	Restrict	Private monitoring
<i>EU countries</i>											
Austria	3	2	11.56	4.1	2.58	2.69	1.69	10	5	7	4
Belgium	3	3	11.64	0.1	1.98	3.16	1.26	11	3	7	6
Bulgaria	1	0	10.59	-24.2	6.33	10.38	0.20	11	7	10	7
Croatia	2	0	10.74	-7.9	3.60	4.48	0.35	10	4	8	6
Cyprus	2	0	10.30	-11.8	4.38	3.52	1.13	12	7	11	7
Czech Republic	1	0	11.24	-3.1	4.12	4.64	0.86	10	4	12	5
Denmark	2	2	11.48	2.1	0.05	2.56	1.89	10	5	9	7
France	5	5	12.40	-1.4	1.28	2.15	1.25	8	8	9	7
Germany	4	4	12.51	6.4	2.16	2.46	1.48	8	7	7	7
Greece	4	3	11.47	-14.2	1.55	3.52	0.64	10	4	8	7
Hungary	1	0	11.10	-7.1	0.69	7.00	0.83	14	8	11	7
Ireland	3	3	11.40	-5.4	1.16	4.47	1.58	12	2	7	7
Italy	4	4	12.32	-2.5	0.21	2.60	0.57	7	4	12	7
Lithuania	1	0	10.54	-13.9	6.38	8.33	0.68	14	3	11	7
Malta	2	0	9.84	-4.7	4.09	2.75	1.26	14	6	10	7
Netherlands	2	1	11.89	5.2	3.14	2.05	1.64	7	5	6	8
Poland	4	0	11.59	-6.4	5.56	3.37	0.60	9	3	8	7
Portugal	2	2	11.35	-11.0	1.35	2.70	1.02	14	8	12	6
Romania	2	0	11.17	-12.6	7.06	6.34	0.11	9	6	11	5
Slovakia	2	0	10.89	-5.5	8.06	3.68	0.78	13	3	10	4
Spain	4	3	12.14	-9.6	2.44	3.43	0.86	11	9	7	8
Sweden	4	4	11.66	8.8	1.42	2.82	1.74	5	4	10	6
United Kingdom	5	5	12.44	-1.9	1.11	2.97	1.44	8	6	4	7
<i>The rest of Europe</i>											
Swiss	2	2	11.66	4.8	3.21	1.58	1.74	14	6	8	6
Norway	4	1	11.56	14.4	1.36	2.25	1.65	8	8	11	6
Turkey	3	1	11.77	-5.7	2.66	9.60	-0.03	n/a	n/a	n/a	n/a
<i>World</i>											
Australia	3	3	11.90	-6.2	3.73	3.34	1.61	13	4	10	7
Japan	4	4	12.64	3.9	0.58	0.72	1.17	12	6	11	8
India	5	2	12.04	-1.6	6.85	7.36	-0.21	10	8	11	6
China	4	4	12.49	9.7	11.90	5.31	-0.51	10	4	15	7
Brazil	1	1	12.09	-0.8	5.63	4.65	-0.07	14	5	9	7
United States	8	8	13.15	-4.8	0.76	3.35	1.28	13	6	11	7
Hong Kong	5	4	11.31	14.0	4.30	3.11	1.46	11	4	3	7

The overall sample includes banks from 33 countries with assets larger than \$1 billion. The sample of large banks includes public banks with assets larger than \$50 billion. Banks are included in the sample if they have a loan-to-asset ratio larger than 10% and a deposit-to-asset ratio larger than 20%. Country characteristics are computed as average for the period 2007–2008. Bank-level attributes, regulation and macroeconomic variables are described in the [Appendix](#)

Table 2 Bank statistics

	Pre-crisis period					Crisis period				
	Min	Max	Mean	Median	St. deviation	Min	Max	Mean	Median	St. deviation
<i>Bank performance</i>										
Stock return, %	-72.44	234.8	26.11	20.17	36.79	-89.07	89.07	-26.18	-29.15	39.93
<i>Bank characteristics</i>										
Deposit/assets (%)	20.60	93.06	66.93	68.31	16.36	21.84	91.04	66.03	65.85	16.46
Loan/assets (%)	2.16	91.44	50.16	51.75	16.77	0.99	86.56	52.88	56.66	18.19
Net income/Total assets (%)	-0.39	3.03	1.02	0.90	0.60	-3.50	3.08	0.81	0.80	0.82
Tier 1 Ratio (%)	3.93	23.44	8.53	7.84	3.54	5.13	20.30	8.73	8.30	2.63
Tangible equity (%)	2.14	16.38	6.74	6.38	2.93	0.87	17.48	6.66	6.20	3.01
Liquid asset (liquid asset/total asset) (%)	0.59	63.91	23.20	21.76	12.24	1.75	57.55	21.09	18.29	11.19
Funding fragility (%)	0.61	68.61	25.60	24.39	16.52	0.13	72.39	26.00	21.64	17.21
ROA (%)	-0.39	3.03	1.01	0.90	0.60	-3.50	3.08	0.81	0.80	0.82
Other earning assets (%)	0.004	10.87	0.88	0.55	1.49	0.01	37.92	0.97	0.45	2.93
Income diversity (%)	1.65	99.35	49.94	47.31	21.74	1.02	97.18	43.79	42.42	22.13
Non-interest income (%)	1.21	98.88	41.20	40.23	18.77	-3.10	90.78	36.05	35.54	19.25
Altman Z-score	-2.50	1.33	0.44	0.45	0.32	-2.47	1.23	0.43	0.42	0.31
Equity volatility (%)	0.05	22.41	6.17	5.12	3.49	1.92	48.08	0.11	9.90	6.68
Earnings volatility (%)	0.15	13.58	0.76	0.35	1.37	0.14	5.94	0.60	0.41	0.66
Beta	0.02	3.29	0.94	0.98	0.61	0.02	3.29	0.88	0.98	0.68
Log Z	0.52	6.73	3.17	3.57	1.40	0.71	5.05	3.17	3.52	1.22
<i>Regulation and institution</i>										
Official	5.00	14.00	10.58	10.50	2.44	5.00	14.00	10.69	10.50	2.42
Capital	2.00	9.00	5.58	6.00	1.73	2.00	9.00	5.38	5.00	1.85
Restrict	3.00	15.00	9.03	9.00	2.30	3.00	15.00	9.25	10.00	2.47
Private monitoring	4.00	9.00	6.59	7.00	1.02	4.00	8.00	6.56	7.00	0.97
Institution	-0.56	1.91	1.00	1.07	0.62	-0.53	1.91	1.00	1.07	0.63
State	0.00	1.00	0.10	0.00	0.30	0.00	1.00	0.11	0.00	0.31
<i>Corporate governance</i>										
Ownership (%)	0.08	100.00	38.85	31.83	33.57	0.19	100.00	39.55	34.00	32.44
<i>Macroeconomic variables</i>										
Log GDP	9.8	13.1	11.8	11.7	0.7	9.876	13.168	11.902	11.811	0.699
Current account (%)	-17.4	16.4	-0.4	-2.2	7.2	-26.21	16.06	-1.21	-2.40	8.08
GDP growth (%)	0.7	12.7	4.3	3.4	2.7	-2.61	14.16	3.06	2.56	3.21

The sample includes 102 banks from 33 countries with returns computed using data from Bloomberg and Datastream. Banks are included in the sample if they have a loan-to-asset ratio larger than 10% and a deposit-to-asset ratio larger than 20%. We split the sample into two periods—pre-crisis (2005–2006) and crisis (2007–2008) period. All the variables except regulation and institution are in percent. Bank characteristics are computed using data for 2005–06 and 2007–08. Bank-level attributes, regulation and macroeconomic variables are described in [Appendix](#)

defined as the absolute value of the difference between net interest income and other operating income divided by total operating income. In line with prior research, we should expect a negative relation between loans and bank performance. To the extent that banks may have performed poorly because of holdings of securities and derivatives, we would

expect the second variable (other earning assets) to have a negative correlation with bank performance. Similarly, we would expect if everything else equal, banks with more liquid assets to be in a better position to reduce their balance sheet and to cope with financing difficulties during the crisis. The last two variables (non-interest income and income

diversity) are used as measures of the extent to which a bank's activities are diversified away from the traditional banking loan business. Data in Table 2 show that the range of non-interest income is extremely wide as the lowest value is -3.10% and the highest is 90.78% . The range of income diversity is quite similar.

To capture the bank exposure to risk, we use various measures outlined in the empirical literature, such as (1) *distance to default*, $\log(Z)$, estimated as the ratio of the return on assets plus the capital-to-asset ratio divided by the standard deviation of the return on assets over the period of ten years [33], (2) *equity volatility* computed as the average standard deviation of the bank's equity returns estimated using annualized total returns for the most recent year, and (3) *earnings volatility*, computed as the average standard deviation of the ratio of total earnings before taxes and loan loss provisions to average total assets over the period of ten years [9]. A higher distance to default means a larger negative return would be required to render the bank insolvent. As an additional measure of risk, we compute the well-known *Altman Z-score* following [44], and beta as the slope of the regression of weekly excess stock returns on the MSCI World excess return for the period from 2004 to 2006.

The last variable we consider in our analysis is an indicator for state ownership, *state*. This variable takes value one if the state owns more than 10% of a bank, and zero otherwise. Eleven percent of the banks in our sample have that level of state ownership.

3.2.3 Regulatory Indicators

Our regulation hypothesis for the performance of banks during the crisis is that lax regulation led banks to take risks that they would not have taken with tighter regulation. In line with this hypothesis, we would expect stricter regulation to be associated with better bank performance during the crisis. We test this hypothesis using data from the third survey of bank regulations conducted by The World Bank and presented in Gorton [43]. The survey results were made available in the summer of 2007.¹¹

Using the data from this survey, we construct four indices as follows: (1) *Official*, an index of the power of the commercial bank supervisory agency, including elements such as the rights of the supervisor to meet with and demand information from auditors, to force a bank to change the internal organizational structure, to supersede the rights of shareholders, and to intervene in a bank, (2) *Capital*, an index of regulatory oversight of bank capital, including indicators for whether the sources of funds that count as

regulatory capital can include assets other than cash and government securities, and whether authorities verify the source of capital, (3) *Restrict*, an index of regulatory restrictions on the activities of banks, consisting, for example, of limitations in the ability of banks to engage in securities market activities, insurance activities, real estate activities, and to own nonfinancial firms, and (4) *Private monitoring*, an index that measures the degree to which regulations empower, facilitate, and encourage the private sector to monitor banks.

Tables 1 and 2 display the value of the regulatory variables for different countries in our sample and across different time periods. Except for private monitoring, the regulation indices vary widely across these countries. It is important to note that the regulatory variables concern depository banks. They do not capture, for instance, the regulatory status of investment banks, or the stance of regulators. A country's regulations might give considerable flexibility to banks, but regulators might prevent banks from using that flexibility [5].¹²

3.2.4 Bank-Level Governance

If poor governance was indeed one of the main causes of the crisis, we would expect banks with better governance to perform better during the crisis. Many analyses, see e.g., Diamond and Rajan [2], have argued that traders and executives of banks had incentives to take risks that were not in the best interests of shareholders. If these observers are right, we would expect banks with better governance to have set incentives and control mechanisms to avoid taking risks that did not benefit shareholders. Hence, these banks should have performed better during the crisis if the risks that worked out poorly during the crisis were not in the best interests of shareholders when they were taken. Further evidence, see e.g., John et al. [27], shows that poor governance can lead executives to take fewer risks to protect their private benefits from control. These analyses predict that banks with better governance will take more risks, which would have led them to poor performance during the crisis if the risks taken before the crisis had unexpected bad outcomes [5].

Similarly, Laeven and Levine [30] find that bank risk is generally higher in banks which have controlling shareholders with large stakes. However, they show that this effect is mitigated by the presence of strong shareholder protection laws. Their analysis concludes that the impact of

¹¹The survey consists of questions sent to regulators and most questions required a yes or no answer. The third survey had more than three hundred questions and had responses from 142 countries.

¹²Much attention has been paid to the moral hazard created by deposit insurance, and prior empirical research shows that explicit deposit insurance is associated with less bank stability [22]. Most countries in our sample have explicit deposit insurance system. Our preliminary tests show that this variable is insignificant in all model specifications and it was dropped from the analysis.

regulation on bank risk depends on whether the bank has a large controlling shareholder. More specifically, stricter regulation decreases bank risk when a bank is widely held but increases it when it has a large controlling shareholder. To test this hypothesis, we include in our analysis a variable that measures the ownership of the controlling shareholder, *ownership*. The data in Table 2 show that for our sample of banks, the ownership concentration is 39.55% on average. However, the range of this variable is extremely high for each of the observation periods.¹³

3.2.5 Country-Level Governance and Macroeconomic Variables

Country-level governance variables are important determinants of firm policies and valuations as well as of financial development. The existing empirical work (see [27]), reports that risk taking is affected by shareholder rights as well as by a country's institutions, such as the institutions protecting property rights. The general notion is that banks in countries with better institutions would be more likely to take decisions that maximize shareholder wealth. If bank executives took bad risks because they were not sufficiently focused on the interests of shareholders, we would expect banks to perform better during the crisis in countries with more protection of shareholder rights and stronger institutions [5]. However, private benefits of control are higher in countries with poor shareholder rights and poor institutions. It could be that executives took fewer risks in such countries to protect their own interests. Hence, banks from these countries could perform better because executives paid less attention to maximizing shareholder wealth before the crisis.

As proxies for country-level governance, we use the country-level indicators of [31]. These indicators are obtained from combining several hundred individual variables measuring political stability, government effectiveness, regulatory quality, enforcement of the rule of law, corruption, and the extent to which a country's citizens are able to participate in selecting their government. Following [45] approach, we create an index, *institution*, which is the mean of the six variables for each country in the sample. A higher value of the index indicates better institutions. The median value of this index for our sample of banks is 1.07 (see Table 2). The last four variables we report in Table 2 are macroeconomic indicators. These are a country's gross domestic product (GDP) per capita (in log form), the ratio of its current account balance to GDP, and GDP growth. These

variables are also shown for each country in Table 1.¹⁴ We also use concentration of the banking sector in each country measured as the ratio of the assets of the three largest banks divided by the total assets of the banking sector in this country. This variable is a proxy for the value of bank franchises because a more concentrated banking system enables banks to earn monopoly rents [5].

4 Empirical Results and Analysis

We run our empirical analysis in two steps. We first compare the characteristics of banks that had the worst return performance (the first quartile, 25th percentile) and those that had the best return performance (third quartile, 75th percentile) during the recent financial crisis. We next perform multivariate regression analysis to examine the main determinants of bank performance during the crisis.

4.1 Characteristics of Worst- and Best-Performing Banks

Table 3 divides the sample into the top and bottom quartiles of return performance over the crisis period (2007–2008). By construction, the difference in average returns between these two groups of banks is extremely large. The bottom-performing quartile banks had an average return of -47.33%, whereas the top-performing banks had a raw return of 1.61% during the crisis period. However, the banks that performed poorly during the crisis had positive returns in pre-crisis period as their average return was 17.93%. The banks that performed better during the crisis period also had strongly positive return in the pre-crisis period (around 26%).

The data in Table 3 show that the best-performing banks had considerably more tangible equity than the banks that performed poorly during the crisis, but this did not result in a significant difference in leverage between the two groups of banks. The better-performing banks are more traditional banks. A large and significant difference in the ratio of deposits to total assets is observed between the best-performing and the worst-performing financial institutions. During the pre-crisis period, the deposits-to-assets ratio was 74.86% for the best-performing banks and 59.30% for the worst-performing ones. The funding fragility measure also shows large and significant difference between the best-performing and the worst-performing banks (16.79%

¹³Beltratti and Stulz[5] construct an index for whether the board was shareholder-friendly in 2006, *board*. The index is higher for more independent boards and is lower for staggered boards. The study finds that banks with more shareholder-friendly boards performed significantly worse during the crisis than other banks. Because of data limitation we were unable to investigate this relationship.

¹⁴To compute the variables in Tables 1 and 2, we use the following sources of information: Bankscope, Datastream, OSIRIS, OECD statistics, FDIC, Annual reports, The World Bank (WDI) database, National banking statistics, IMF database, Yahoo Finance, and Thomson Reuters.

Table 3 Summary statistics for banks from 2007 to 2008

Variable	Mean of banks in the bottom quartile of the distribution of returns	Mean of banks in the top quartile of the distribution of returns	Test for equality of means (<i>p</i> -value)
<i>Bank performance</i>			
2005–2006 return (%)	17.93	25.75	0.000***
2007–2008 return (%)	–47.33	1.61	0.000***
<i>Bank characteristics</i>			
Deposit/assets (%)	59.30	74.86	0.000***
Loan/assets (%)	45.49	52.19	0.072*
Net income/total assets (%)	0.67	1.27	0.000***
Tier 1 ratio (%)	8.18	8.52	0.701
Tangible equity (%)	4.60	8.17	0.000***
Liquid asset (liquid asset/total asset) (%)	26.13	23.03	0.315
Funding fragility (%)	35.24	16.79	0.000***
Other earning assets (%)	112.37	49.26	0.031**
Income diversity (%)	55.32	37.53	0.003***
Non-interest income (%)	48.35	31.69	0.002***
Altman Z-score	0.43	0.54	0.201
Equity volatility (%)	4.94	7.36	0.011**
Earnings volatility (%)	0.61	1.01	0.403
Beta	1.13	0.50	0.000***
Log Z	3.21	2.72	0.348
<i>Regulation and institution</i>			
Official	0.02	0.31	0.486
Capital	5.10	5.27	0.853
Restrict	8.06	8.96	0.643
Private monitoring	6.75	7.73	0.376
Institution	1.38	0.42	0.000***
State	0.02	0.31	0.006***
<i>Corporate governance</i>			
Ownership (%)	21.77	42.70	0.003***
<i>Macroeconomic variables</i>			
Log GDP	12.11	11.70	0.015**
Current account (%)	0.78	–2.16	0.223
GDP growth (%)	3.06	6.53	0.000***

This table compares the characteristics of banks in the bottom quartile of stock return performance relative to those in the top quartile of stock return performance. The sample includes the 102 banks from 33 countries with returns computed using data from Bloomberg and Datastream. Banks are included in the sample if they have a loan-to-asset ratio larger than 10% and a deposit-to-asset ratio larger than 20%. Returns are in percent. Bank characteristics are computed using data for pre-crisis period, 2005–2006. Two-sample *t*-test with unequal variances is used to test the mean difference between the two samples (quartiles). *, **, and *** indicate statistical significance at the 10, 5, and 1% level, respectively. Bank-level characteristics, risk measures, regulation and institution variables, and ownership are described in [Appendix](#)

vs. 35.24%). Neither the ratio of loans-to-total assets nor the ratio of liquid assets to total assets was significantly different between the two groups of banks. Surprisingly, we find that the worst-performing banks were considerably more diversified than the best-performing ones. Existing evidence shows that a large proportion of banks experienced

significant losses because of their heavy dependence on off-balance-sheet activities just before the crisis. It is often argued that these kinds of activities are considered as non-traditional.

Moreover, we observe that the non-interest income ratio in both top- and bottom-quartile banks was significantly high

in that period, with the mean difference significant at the 1% level. This again means that banks had actively participated in activities different from the traditional ones. Surprisingly, the worst-performing financial institutions had less ex-ante risk using distance to default measure; however, the mean difference is not statistically significant. If equity volatility is used as a measure of risk, the evidence supports our expectations – worst-performing banks did have less risk exposure during the pre-crisis period. The best-performing banks have a significantly larger ownership share than the worst-performing banks.

Previous studies report that best-performing banks are usually coming from more strictly regulated countries, that is, from countries “with more powerful supervisors, more restrictions on what counts as capital, more restrictions on banking activities, and more private monitoring” [5], p. 20. We do not find evidence in support of this argument (none of the regulatory variables is significantly different between the two groups of banks). However, banks that performed better during the crisis come from countries with a worse institutional environment. Finally, we observe a significant difference in GDP per capita and GDP growth rate between the two groups of banks. The best-performing banks come from countries with much higher GDP growth rate than the worst-performing banks (6.53% vs. 3.06%). However, the result for the current account is inconsistent with the view that sharp inflows of capital (the other side of the coin from a current account deficit) led to a worse credit boom.

4.2 Multiple Regressions

The analysis in the previous section shows that the financial institutions that performed poorly during the financial crisis had, on average, lower returns, less deposits and loans, lower ex-ante risk, more funding fragility, and they came from countries with better institutional environment (see Table 3). These results, however, should be treated with caution as many of these bank characteristics are correlated. Further, they might be correlated with unobserved country characteristics [5]. Therefore, in this section, we estimate multiple regressions to evaluate the relation between various bank characteristics and bank performance during the crisis. Our regressions analysis is based on panel data. We use Hausman test [46] to estimate the specification of our model (i.e., random or fixed effect specification).

In some regressions, we control for country fixed effects. However, we cannot control for country fixed effects in all regressions because of possible multicollinearity when using regulatory and macroeconomic variables. Thus, we estimate regressions in two steps—we first run our model without regulatory and macroeconomic variables, but with country fixed effects (see Table 4), and then, we run regressions with

regulatory and macroeconomic variables, but without country fixed effects (see Table 5). Both regressions use bank equity returns as a dependable variable. The variables used in the analysis are described in Appendix.

4.2.1 Corporate Governance and Country Fixed Effects

Table 4 reports the outcome of the regression analysis. Model 1 of Table 4 includes all banks in the sample.¹⁵ Contrary to the common view that the performance of traditional banks depends mostly on loans and deposits, we do not find a statistically significant relation with bank performance. Tier 1 ratio is also insignificant. In line with the results reported in Table 2, banks that performed better in the pre-crisis period (2005–2006), had significantly worse returns during the crisis (the estimated coefficient of stock return variable is highly significant and negative). No systematic evidence exists in support of the argument that banks in which the controlling shareholder had a large stake performed better. Risk measures (beta and distance to default) are not significant, while the negative coefficient of size variable shows that banks with larger size performed more poorly during the crisis.

In regressions 2 and 3 we use the same dependent and independent variables but a different sample, which includes banks with more than \$50 billion in assets (large banks). The deposit ratio has a positive and marginally significant coefficient. To judge the economic significance of this coefficient, a 1 standard deviation increase in the deposit ratio is associated with an increase in stock return of 6.99 percentage points. In model 3, we add the state variable, which is statistically insignificant. Rest of the variables have similar sign and magnitude as in Model 2. In the next two regressions, we drop deposit ratio and add funding fragility variable. We observe that the coefficient on funding fragility is negative and highly significant only in the group of large banks (see Model 5). This result provides support to our hypothesis that bank runs on short-term funding made the crisis worse in that banks more vulnerable to such runs performed more poorly during the crisis period.¹⁶ In models 6 and 7 we replace income diversity with non-interest income and run the regression separately for all banks and large banks. The coefficient of the new variable is not significant in either specification. In other words, given the

¹⁵We do not report in Table 4 the estimates of the country fixed effects but they are available upon request. Based on Hausman [46] test we report the models in Tables 4 and 5 as fixed effect specifications.

¹⁶According to many scholars and researchers (see [2, 4–6]), non-interest activities and short-term funding were considered as a major cause of the excessive bank risk exposure. It is well known that these activities generate higher returns due to their complexity and diversification.

Table 4 Panel regressions of equity return with country fixed effects (2007–2008)

Explanatory variables	Model 1: all banks	Model 2: large banks	Model 3: large banks and state	Model 4: all banks and funding fragility	Model 5: large banks and funding fragility	Model 6: all banks and none-interest	Model 7: large banks and none-interest	Model 8: all non-US banks	Model 9: large non-US banks
Constant	0.108 (0.805)	-0.023 (0.942)	-0.019 (0.952)	0.268 (0.520)	0.164 (0.573)	0.197 (0.663)	0.419 (0.165)	0.497 (0.392)	-0.078 (0.816)
Deposit/assets	0.172 (0.456)	0.268* (0.105)	0.282* (0.101)					0.184 (0.477)	0.335* (0.073)
Loan/assets	-0.121 (0.707)	-0.319 (0.217)	-0.305 (0.239)	-0.173 (0.580)	-0.284 (0.243)	-0.173 (0.588)	-0.260 (0.293)	-0.083 (0.852)	-0.193 (0.605)
Net income/total assets	-1.536 (0.833)	4.984 (0.484)	6.682 (0.297)	-2.837 (0.659)	3.158 (0.617)	-2.583 (0.686)	3.435 (0.587)	-0.920 (0.896)	9.838 (0.205)
Tier 1 ratio	-0.165 (0.799)	-0.237 (0.700)	-0.252 (0.682)	-0.321 (0.615)	-0.561 (0.369)	-0.382 (0.556)	-0.602 (0.336)	-0.124 (0.860)	-0.421 (0.552)
Tangible equity	-0.002 (0.999)	0.756 (0.597)							
2005–2006 return	-0.252*** (0.000)	0.087*** (0.003)	-0.272*** (0.002)	-0.248*** (0.000)	-0.268*** (0.002)	-0.254*** (0.000)	-0.273*** (0.002)	-0.249*** (0.000)	-0.324*** (0.000)
Liquid assets	0.125 (0.751)	-0.017 (0.956)	-0.035 (0.910)	0.144 (0.704)	0.053 (0.857)	0.100 (0.787)	0.028 (0.922)	0.286 (0.506)	0.135 (0.691)
Funding fragility				-0.266 (0.127)	-0.337** (0.014)	-0.289* (0.100)	-0.354*** (0.007)		
Log(assets)	-0.030* (0.096)	-0.018* (0.080)	-0.017* (0.087)	-0.032* (0.070)	-0.020** (0.042)	-0.032* (0.075)	-0.019** (0.049)	-0.049* (0.075)	-0.011 (0.277)
Other earning assets	-0.006 (0.773)	-0.005 (0.738)	-0.006 (0.673)	-0.005 (0.803)	-0.003 (0.785)	-0.006 (0.753)	-0.003 (0.792)	0.006 (0.912)	-0.030 (0.476)
Income diversity	-0.092 (0.502)	-0.066 (0.556)	-0.062 (0.587)	-0.053 (0.703)	0.002 (0.985)			-0.055 (0.726)	0.028 (0.836)
Non-interest income						0.031 (0.874)	0.070 (0.627)		
Equity volatility	-1.019 (0.267)	-1.329 (0.133)	-1.299 (0.143)	-1.021 (0.250)	-1.316* (0.107)	-0.994 (0.262)	-1.311 (0.113)	-0.935 (0.325)	-1.495* (0.087)
Beta	0.0001 (0.993)	-0.021 (0.776)	-0.021 (0.772)	0.002 (0.923)	-0.012 (0.861)	0.003 (0.881)	-0.002 (0.971)	0.001 (0.943)	0.016 (0.829)
Log Z	-0.012 (0.581)	-0.012 (0.493)	-0.011 (0.514)	-0.017 (0.429)	-0.017 (0.324)	-0.017 (0.430)	-0.019 (0.292)	-0.014 (0.544)	-0.018 (0.334)
Ownership	0.051 (0.586)	0.0008 (0.993)	-0.004 (0.961)	0.051 (0.570)	0.013 (0.879)	0.053 (0.555)	0.019 (0.827)	0.049 (0.605)	0.004 (0.965)
State			0.024 (0.812)						
Country effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	194	140	140	194	140	194	140	178	124
R-squared (overall)	0.2226	0.1658	0.1647	0.2301	0.1843	0.2274	0.1795	0.2327	0.1668
	FE	FE	FE	FE	FE	FE	FE	FE	FE

The panel data regressions estimate the relation between stock returns over the period of 2007–2008 and bank characteristics. The sample includes 102 banks from Bankscope with returns computed using data from Bloomberg and Datastream. Banks are included in the sample if they have a loan-to-asset ratio larger than 10% and a deposit-to-asset ratio larger than 20%. The sample of large banks includes public banks with assets larger than \$50 billion. Returns are in percent. Bank-level characteristics are computed using data for pre-crisis period, 2005–2006. All the regressions control for country fixed effects. *, **, and *** indicate statistical significance at the 10, 5, and 1% level, respectively. Bank-level characteristics, risk measures, regulatory and institution variables, and ownership are described in [Appendix](#)

Table 5 Panel regressions with regulatory and macroeconomic variables (2007–2008)

Explanatory variables	Model 1: all banks	Model 2: large banks	Model 3: large banks with regulation only	Model 4: all banks and funding fragility	Model 5: large banks and funding fragility	Model 6: all banks and non-interest	Model 7: large banks and non-interest	Model 8: All non-US banks	Model 9: Large non-US banks
Constant	1.366** (0.034)	0.545 (0.424)	-0.021 (0.969)	1.186* (0.055)	0.817 (0.224)	1.317** (0.029)	0.882 (0.174)	0.330 (0.627)	-0.814 (0.303)
Deposit/assets	0.134 (0.441)	0.158 (0.327)						0.127 (0.478)	0.229 (0.138)
Loan/assets	0.020 (0.946)	0.246 (0.406)		0.031 (0.915)	0.250 (0.380)	-0.189 (0.438)	-0.048 (0.831)	-0.179 (0.597)	0.110 (0.733)
Net income/total assets	3.931 (0.522)	3.994 (0.573)		-2.810 (0.528)	0.918 (0.854)	-2.156 (0.608)	2.217 (0.639)	-0.351 (0.946)	9.144 (0.148)
Tier 1 ratio	-0.399 (0.486)	-0.270 (0.678)		-0.290 (0.606)	-0.115 (0.855)	-0.524 (0.311)	-0.462 (0.416)	-0.665 (0.275)	-0.131 (0.851)
Tangible equity	-1.239 (0.361)	0.178 (0.895)							
2005–2006 return	-0.279*** (0.000)	-0.299*** (0.002)		-0.269*** (0.000)	-0.295*** (0.001)	-0.280*** (0.000)	-0.311*** (0.000)	-0.233*** (0.001)	-0.280*** (0.006)
Liquid assets	0.189 (0.458)	0.217 (0.371)		0.293 (0.250)	0.322 (0.180)	0.122 (0.613)	0.168 (0.453)	0.149 (0.595)	0.075 (0.770)
Funding fragility				-0.357** (0.028)	-0.378** (0.018)	-0.329** (0.017)	-0.311** (0.013)		
Log(Assets)	-0.024** (0.037)	-0.013 (0.209)		-0.023** (0.046)	-0.013 (0.191)	-0.028** (0.014)	-0.012 (0.266)	-0.028** (0.025)	-0.012 (0.248)
Other earning assets	0.005 (0.921)	0.058 (0.159)		0.001 (0.980)	0.043 (0.280)	-0.006 (0.747)	0.004 (0.783)	-0.027 (0.621)	0.023 (0.599)
Income diversity	-0.133 (0.245)	-0.144 (0.176)		-0.122 (0.277)	-0.098 (0.356)			-0.062 (0.638)	-0.022 (0.852)
Non-interest income						-0.023 (0.870)	0.029 (0.812)		
Equity volatility	-2.294*** (0.002)	-1.337* (0.093)		-2.070*** (0.004)	-0.992 (0.207)	-2.076*** (0.004)	-0.806 (0.293)	-1.063 (0.174)	-0.815 (0.317)
Beta	0.019 (0.209)	-0.073* (0.087)		0.021 (0.160)	-0.077* (0.054)	0.0235 (0.115)	-0.067* (0.091)	0.011 (0.474)	-0.080* (0.073)
Log Z	-0.031* (0.056)	-0.011 (0.527)		-0.031** (0.049)	-0.011 (0.503)	0.035** (0.024)	-0.011 (0.491)	-0.020 (0.228)	0.003 (0.842)
Ownership	-0.000 (0.997)	-0.006 (0.928)		0.013 (0.856)	-0.012 (0.865)	0.003 (0.967)	-0.018 (0.809)	0.033 (0.695)	-0.016 0.842
Official	-0.021** (0.020)	-0.014* (0.096)	-0.002 (0.769)	-0.019** (0.023)	-0.011 (0.143)	-0.021** (0.017)	-0.010 (0.181)		
Capital	0.044*** (0.001)	0.017 (0.162)	0.008 (0.507)	0.041*** (0.002)	0.016 (0.165)	0.043*** (0.001)	0.015 (0.160)		
Restrict	0.014 (0.123)	0.026*** (0.003)	0.025*** (0.004)	0.014 (0.126)	0.025*** (0.004)	0.014 (0.123)	0.026*** (0.002)		
Private monitoring	-0.033** (0.045)	-0.025 (0.115)	-0.026* (0.082)	-0.033** (0.040)	-0.027* (0.074)	-0.036** (0.022)	-0.027** (0.048)		
Institution	-0.190*** (0.002)	-0.095* (0.089)	-0.067 (0.195)	-0.143** (0.016)	-0.085* (0.104)	-0.148** (0.014)	-0.085* (0.095)		
Current account	-0.270 (0.512)	-0.567 (0.183)	-0.401 (0.268)	-0.380 (0.355)	-0.672* (0.100)	-0.320 (0.423)	-0.669* (0.088)	-0.642* (0.095)	-0.666* (0.091)

(continued)

Table 5 (continued)

Explanatory variables	Model 1: all banks	Model 2: large banks	Model 3: large banks with regulation only	Model 4: all banks and funding fragility	Model 5: large banks and funding fragility	Model 6: all banks and non-interest	Model 7: large banks and non-interest	Model 8: All non-US banks	Model 9: Large non-US banks
Log GDP	-0.071* (0.084)	-0.055 (0.242)	-0.033 (0.460)	-0.054 (0.186)	-0.063 (0.169)	-0.047 (0.262)	-0.060 (0.194)	-0.012 (0.787)	0.041 (0.454)
GDP growth	1.657 (0.212)	2.226* (0.101)	4.162*** (0.001)	2.078* (0.105)	2.156* (0.108)	2.042* (0.102)	2.575** (0.047)	3.647** (0.001)	2.202** (0.036)
Country effects	No	No	No	No	No	No	No	No	No
Number of observations	191	135	135	191	135	194	141	181	125
R-squared (overall)	0.1816	0.1466	0.0641	0.1910	0.1629	0.1786	0.1539	0.0823	0.0819

The panel data regressions estimate the relation between stock returns over the period of 2007–2008 and bank characteristics. We also control for regulatory and macroeconomic effects. The sample includes 102 banks from Bankscope with returns computed using data from Bloomberg and Datastream. Banks are included in the sample if they have a loan-to-asset ratio larger than 10% and a deposit-to-asset ratio larger than 20%. The sample of large banks includes public banks with assets larger than \$50 billion. Returns are in percent. Bank-level characteristics are computed using data for pre-crisis period, 2005–2006. *, **, and *** indicate statistical significance at the 10, 5, and 1% level, respectively. Bank-level characteristics, risk measures, regulatory and institution variables, and ownership are described in [Appendix](#)

other bank characteristics in our regressions, banks with exposure to non-traditional banking activities (different from deposits and loans) did not perform worse during the crisis. Finally, we run our regressions excluding the US banks. The reason is that we would like to see if our results (especially those for large banks) are somewhat influenced by the presence of the US banks in our sample. The results do not change significantly (see Models 8 and 9).

4.2.2 Regulation and Macroeconomic Effects

Next, we investigate the relation between regulatory variables and equity returns of banks in our sample. The results are reported in Table 5. The regulatory measures we use in our analysis apply to banks subject to the Basel Accords. We therefore show regression estimates only for such banks. In Regression 1 (and all other models), we replace the country fixed effects used in Table 4 with country-level variables that include regulatory variables and macroeconomic variables (log of GDP per capita, the ratio of current account to GDP, and GDP growth).

We first run our regression for all banks (excluding the US investment banks) and find that bank-related characteristics (except log of assets) are insignificant determinants of their performance. However, risk taking activities before the crisis had a strong impact on bank performance during the crisis (equity volatility and distance to default are statistically significant). Now we turn to the regulatory variables. The coefficient of bank capital requirements is positive and strongly significant. A one standard deviation increase in capital is associated with an improvement in stock return of

less than one percentage point. Both the official supervisory index and private monitoring have negative significant coefficients. Well-performing banks come from countries with a poor institutional environment. Regression 2 includes only large banks. In line with [5], large banks that come from countries with more restrictions on bank activities performed better during the crisis. This finding strongly supports our second hypothesis. Equity volatility and beta are both marginally significant and negatively correlated with bank stock return. Banks that come from countries with strong economic growth performed better.

The bank characteristics could be viewed as depending on the regulatory variables and other country characteristics. Consequently, regressions that have both bank characteristics and regulatory variables could underestimate the relation between performance and regulation [5]. To investigate this possibility, we estimate regressions of bank performance on country variables only. Model 3 in Table 5 shows the results for such a regression using the sample of large banks. The coefficient on the index of restrictions of bank activities is positive and significant; therefore, the estimates of this regression are consistent with the estimates of Regression 2. In the next two models, we drop deposit ratio and add funding fragility. In line with our expectations, funding fragility has a strong negative impact on bank performance (the estimated coefficient of this variable is strongly significant in either sample). The results do not change when we replace income diversity variable with non-interest income (see Models 6 and 7). The coefficient on restrictions of bank activities is positive and significant only in the sample of

large banks. In last two regressions, we use only non-US banks. No significant changes in the sign and magnitude of bank-level characteristics are observed.

In conclusion, we find a positive and significant relation between the restrictions on bank activities and bank stock return during the crisis. This finding holds only in the sample of large banks. In line with [5], a possible interpretation of this result could be that more restrictions on bank activities forced banks to be less risky. However, such an interpretation seems somewhat counterintuitive because diversification would reduce risk. Another interpretation of this hypothesis is that banks in countries with more restrictions were lucky *ex post*. That is, they did not enter into new activities that later on turned out poorly performing. The first interpretation should be associated with a negative relation between risk measures and restrictions on bank activities. To test this hypothesis, in the next section we investigate the relation between bank risk taking and bank characteristics (including macroeconomic and regulatory variables).¹⁷

4.3 Risk and Bank Characteristics

To investigate whether regulations reduced the risk of banks ahead of the crisis, we investigate how the risk of banks in pre-crisis period is related to bank-level and country-specific characteristics. Such an investigation is especially important to interpret the positive relation between bank performance and the index of restrictions on bank activities shown in Table 5.

In Table 6, we estimate our regressions using distance to default as a dependent variable. In the first two models, we control for country fixed effects, while in Models 3 and 4 we add regulatory and macroeconomic variables. Regression 1 uses the sample of all banks. We find that banks with less funding fragility before the crisis seem to have a higher distance to default, respectively, lower risk. The share of ownership by the controlling shareholder also has a strong impact on bank risk taking; the relation is significant and strongly negative. In the next two models, we introduce macroeconomic and regulatory variables in addition to bank specific characteristics. Surprisingly, bank leverage as measured by loan to total asset ratio is positively correlated with distance to default. The only significant regulatory variable is private monitoring. The estimated coefficient on *restrict* is positive but insignificant. Again, there is no evidence that

greater restrictions on bank activities led banks to take less risk before the crisis.

In the next four regressions, we use tangible equity as dependent variable. We find that banks with higher net income to total assets and less funding fragility have more tangible equity in both samples (see Models 5 and 6). Ownership is significant in all model specifications except for large banks. In the last two regressions in Table 6, we add the regulatory variables, the current account, the log of GDP per capita and GDP growth rate, instead of country fixed effects. The results do not change significantly except for deposit ratio, which is now significant. The private monitoring and institutional environment proxies are important determinants of a bank's tangible equity. However, the estimated coefficient on *restrict* is insignificant. Current account has a role to play only in the sample of large banks. To conclude, the results in Table 6 show that restrictions on bank activities were not associated with less risk taking in the pre-crisis period. Our findings support [5] who argue that the fact that banks in countries with more restrictions on bank activities performed better during the crisis might be due to luck. To put it differently, these banks did not have the opportunity to engage in activities that unexpectedly turned out badly during the crisis.

4.4 Alternative Specifications and Robustness Check

In addition to the regressions discussed in the previous sections, we investigate the robustness of our results using other specifications and other data. Rather than estimating the bank performance through equity return, we used other profitability measures such as the ROA and ROE (the results are available upon request). We observe that banks with more loans and higher tangible equity seem to have higher profitability during the crisis. Further, we do not find evidence that banks with less *ex ante* risk did perform better during the crisis. Two of our regulatory variables (the index of official supervisory power and institution) have a significant impact on bank profitability. This effect seems to be more pronounced in the sample of large banks. Ownership and GDP growth rate are positively correlated with bank profitability. We also run our models with ROE as dependent variable. The results are quite similar with that approach (except for liquid assets with a positive and significant coefficient).

For robustness purposes, in addition to the fixed and random effects models (reported in the previous tables), the analysis employs identical specifications using GMM estimator, developed by Arellano and Bover[10]. This estimator controls for the presence of unobserved firm-specific effects and for the endogeneity of explanatory variables. The

¹⁷We believe this analysis is particularly important as it may bring additional evidence in support of the hypothesis that there should be a positive relation between restrictions on bank activities and their risk exposure. This is also in line with our hypothesis that tighter regulations helped reduce bank risk during the recent financial crisis.

Table 6 Panel regressions with numerous estimators of ex ante risk (2007-2008)

Explanatory variables	Log(Z)				Tangible Equity ($\times 10$)			
	Model 1: all banks	Model 2: large banks	Model 3: all banks and regulatory variables	Model 4: large banks and regulatory variables	Model 5: all banks	Model 6: large banks	Model 7: all banks and regulatory variables	Model 8: large banks and regulatory variables
Constant	2.177* (0.108)	2.602* (0.088)	-5.719* (0.051)	3.265 (0.396)	0.758*** (0.000)	0.568*** (0.000)	0.661** (0.043)	0.0629 (0.160)
Deposit/assets			-0.352 (0.656)	-0.563 (0.524)			0.233*** (0.008)	0.0210** (0.041)
Loan/assets	1.159 (0.308)	0.008 (0.996)	3.406*** (0.004)	3.270** (0.012)	-0.019 (0.891)	0.130 (0.390)	0.0003 (0.980)	-0.0019 (0.895)
Net income/total assets	6.981 (0.764)	7.937 (0.832)	33.328 (0.111)	1.090 (0.970)	18.194 *** (0.000)	18,776*** (0.000)	32.326*** (0.000)	36.584*** (0.000)
Tier 1 ratio	1.501 (0.521)	4.973 (0.196)	0.395 (0.880)	0.488 (0.888)	0.565** (0.049)	-0.536 (0.181)	0.683** (0.019)	0.221 (0.584)
2005-2006 return	0.153 (0.540)	-0.262 (0.615)	-0.247 (0.413)	-0.748 (0.154)	-0.005 (0.850)	-0.022 (0.674)	-0.043 (0.196)	-0.052 (0.388)
Liquid assets	1.151 (0.412)	-0.062 (0.972)	1.219 (0.325)	2.072 (0.132)	-0.347** (0.045)	-0.116 (0.530)	-0.058 (0.673)	-0.113 (0.478)
Funding fragility	-1.336** (0.034)	-1.199* (0.106)			-0.283 *** (0.000)	-0.353*** (-0.000)		
Log(assets)	0.033 (0.618)	0.032 (0.596)	0.083 (0.157)	0.084 (0.225)	0.001 (0.845)	0.005 (0.396)	-0.005 (0.407)	0.003 (0.653)
Other earning assets	0.054 (0.486)	0.013 (0.881)	0.100 (0.315)	0.103 (0.279)	0.017* (0.063)	-0.012 (0.158)	0.012 (0.251)	0.007 (0.489)
Income diversity	-0.007 (0.989)	0.380 (0.575)	0.270 (0.631)	0.418 (0.512)	-0.018 (0.767)	0.035 (0.612)	-0.002 (0.970)	-0.019 (0.795)
Ownership	-0.986*** (0.002)	-1.446*** (0.002)	-0.687* (0.067)	-1.019** (0.017)	-0.120*** (0.002)	-0.063 (0.182)	-0.0094** (0.024)	-0.087* (0.080)
Official			-0.067* (0.102)	-0.048 (0.348)			-0.005 (0.243)	-0.001** (0.010)
Capital			0.067 (0.294)	0.059 (0.380)			0.000 (0.967)	-0.000 (0.939)
Restrict			0.028 (0.534)	0.038 (0.464)			0.000 (0.948)	0.005 (0.381)
Private monitoring			-0.135* (0.080)	-0.185** (0.024)			-0.015* (0.074)	-0.017* (0.062)
Institution			0.356 (0.206)	0.245 (0.423)			-0.141*** (0.000)	-0.129*** (0.000)
Current account			-3.600* (0.061)	-8.217*** (0.000)			-0.0224 (0.295)	-0.576** (0.024)
Log GDP			0.536*** (0.009)	-0.164 (0.568)			-0.001 (0.959)	-0.002 (0.939)
GDP growth			1.424 (0.818)	5.380 (0.485)			1.812*** (0.009)	-1.089 (0.225)

(continued)

Table 6 (continued)

Explanatory variables	Log(Z)				Tangible Equity ($\times 10$)			
	Model 1: all banks	Model 2: large banks	Model 3: all banks and regulatory variables	Model 4: large banks and regulatory variables	Model 5: all banks	Model 6: large banks	Model 7: all banks and regulatory variables	Model 8: large banks and regulatory variables
Country effects	Yes	Yes	No	No	Yes	Yes	No	No
Number of observations	194	140	194	141	194	140	194	141
R-squared (overall)	0.651	0.5499	0.2381	0.3278	0.8529	0.8365	0.7376	0.6967

The panel data regressions estimate the relation between various measures of ex ante risk over the period of 2007–2008 and bank characteristics. The sample includes 102 banks from 33 countries with returns computed using data from Bloomberg and Datastream. Banks are included in the sample if they have a loan-to-asset ratio larger than 10% and a deposit-to-asset ratio larger than 20%. The sample of large banks includes public banks with assets larger than \$50 billion. Bank-level characteristics are computed using data for pre-crisis period, 2005–2006. The measures of ex ante risk are *distance to default* which is the log of the distance to default measures calculated as bank's ROA plus the capital-to-asset ratio divided by the $\sigma(\text{ROA})$ over the period 1996–2007, and *tangible equity* defined as equity minus intangible assets whenever available or equity when intangible assets are not available, divided by total assets. The regressions control for country fixed effects or regulatory and macroeconomic effects. *, **, and *** indicate statistical significance at the 10, 5, and 1% level, respectively. Bank-level characteristics, regulatory and institution variables, and ownership, are described in [Appendix](#)

instruments used depend on the assumption made as to whether the variables are endogenous or predetermined, or exogenous. Instrument validity is tested using the Sargan test of overidentifying restrictions. The GMM estimators reported here generally produced more reasonable estimates of the autoregressive dynamics than the basic first-differenced estimators.¹⁸ The result of GMM tests are reported in Table 7 through Table 9. Table 7 shows the results for panel regressions of bank equity return with country fixed effects, included in each model, while Table 8 reports regressions with regulatory and macroeconomic variables. The results are quite similar except for loan to assets ratio, which is negatively correlated with bank stock return. We confirm our previous results that banks from countries with better restrictions on bank activities performed better during the crisis. This finding holds only in the sample of large banks. Finally, in Table 9 we repeat our panel regressions with different estimators of ex-ante risk (distance to default and tangible equity). We find that our conclusions are unchanged.

We run several alternative specifications. We estimate the regressions of Table 4 using different explanatory variables. Following [5], we use the index for bank concentration and find it insignificant in all model specifications. We use an

¹⁸Specifically, we used Arellano Bover-Blundell-Bond Estimation with the following features: (1) One-step estimator with 95% confidence level, (2) one lag for the dependent variable which is significant, and 15 “max lags of the predetermined variables for use as instruments”, (3) for the Standard Error type the GMM (Default Standard Error) is used, and (4) lags for the regulatory and macroeconomic variables due to endogeneity.

alternative measure of bank liquidity, that is, liquid assets divided by deposits plus short-term funding. It is not significant either, but it is highly correlated with some other bank characteristics. Finally, we investigate the impact of interactions between the ownership variable and the regulatory variables as in Laeven and Levine [30]. In contrast to their results, we do not find evidence that capital requirements and other regulations of bank activities have significant impact on bank performance that depends on ownership structure. We also investigate the relation between the post-crisis return and regulatory variables, and find that the index of official supervisory power and the restrictions on bank activities are strongly correlated with bank performance.

5 Conclusion

In this paper, we examine the main determinants of stock return performance of 102 large and medium sized banks across the world, during the recent financial crisis of 2007–2008. We test the validity of various hypotheses advanced in the academic literature to address the question of why some banks performed so poorly during the crisis.

The previous analyses of the crisis (see [1–3]) argue that poor governance is the main cause of the recent financial crisis. To the extent that governance played a role, we would expect banks with better governance to have performed better during the crisis. Our analysis does not support this hypothesis; no significant relation between governance (as proxied by ownership of the controlling

Table 7 Panel regressions (GMM) of equity return with country fixed effects (2007–2008)

Explanatory variables	Model 1: all banks	Model 2: large banks	Model 3: large banks and state	Model 4: all banks and funding fragility	Model 5: large banks and funding fragility	Model 6: all banks and none-interest	Model 7: large banks and none-interest	Model 8: all non-US banks	Model 9: large non-US banks
Constant	-0.402 (0.363)	0.586* (0.067)	0.647** (0.041)	-0.025 (0.952)	0.538* (0.107)	0.276 (0.486)	0.581* (0.117)	0.590 (0.269)	0.057 (0.893)
Deposit/assets	0.498** (0.021)	0.273 (0.147)	0.305* (0.106)					0.350 (0.132)	0.312* (0.117)
Loan/assets	0.049 (0.876)	-0.682** (0.020)	-0.671** (0.023)	0.118 (0.703)	-0.645** (0.019)	0.032 (0.918)	-0.648** (0.019)	-0.332 (0.430)	-0.375 (0.371)
Net income/total assets	-2.813 (0.704)	3.707 (0.640)	7.532 (0.291)	-4.146 (0.529)	3.267 (0.645)	-2.658 (0.686)	3.071 (0.665)	-1.818 (0.796)	0.362 (0.966)
Tier 1 ratio	0.017 (0.978)	-0.220 (0.735)	-0.222 (0.734)	-0.249 (0.700)	-0.791 (0.235)	-0.154 (0.816)	-0.763 (0.257)	-0.441 (0.534)	-0.137 (0.863)
Tangible equity	0.827 (0.631)	1.630 (0.273)							
2005–2006 return	-0.217*** (0.001)	-0.254** (0.012)	-0.263*** (0.009)	-0.213*** (0.001)	-0.272*** (0.006)	-0.213*** (0.001)	-0.268*** (0.007)	-0.180*** (0.006)	-0.295*** (0.004)
Liquid assets	-0.073 (0.856)	-0.320 (0.340)	-0.348 (0.300)	0.063 (0.871)	-0.347 (0.275)	0.038 (0.922)	-0.324 (0.295)	-0.207 (0.637)	-0.068 (0.860)
Funding fragility				-0.545*** (0.001)	-0.525*** (0.000)	-0.537*** (0.001)	-0.513*** (0.000)		
Log(assets)	-0.006 (0.699)	-0.025** (0.034)	-0.024** (0.044)	-0.011 (0.492)	-0.026** (0.022)	-0.011 (0.487)	-0.027** (0.021)	-0.037 (0.169)	-0.023* (0.059)
Other earning assets	0.016 (0.424)	-0.019 (0.249)	-0.022 (0.173)	0.025 (0.199)	-0.017 (0.244)	0.022 (0.252)	-0.017 (0.240)	-0.001 (0.978)	0.005 (0.912)
Income diversity	-0.177 (0.173)	-0.126 (0.308)	-0.139 (0.271)	-0.117 (0.380)	0.015 (0.906)			-0.033 (0.817)	0.033 (0.825)
Non-interest income						-0.200 (0.283)	-0.023 (0.883)		
Equity volatility	-0.781 (0.382)	-1.862* (0.054)	-1.727* (0.074)	-0.999 (0.250)	-1.578* (0.087)	-0.969 (0.265)	-1.591* (0.080)	-0.998 (0.268)	-1.623* (0.116)
Beta	-0.008 (0.688)	0.020 (0.807)	0.017 (0.832)	-0.003 (0.878)	0.049 (0.545)	-0.005 (0.794)	0.043 (0.603)	-0.004 (0.850)	0.0001 (0.999)
Log Z	-0.033 (0.138)	-0.040** (0.042)	-0.037* (0.061)	-0.042* (0.060)	-0.053*** (0.008)	-0.042* (0.061)	-0.052*** (0.009)	-0.032 (0.154)	-0.035* (0.096)
Ownership	-0.0007 (0.994)	-0.060 (0.566)	-0.067 (0.521)	0.002 (0.978)	-0.048 (0.639)	-0.0003 (0.997)	-0.052 (0.616)	0.049 (0.598)	-0.044 (0.691)
State			-0.016 (0.886)						
Lag(return)	0.327*** (0.000)	0.425*** (0.000)	0.433*** (0.000)	0.357*** (0.000)	0.444*** (0.000)	0.365*** (0.000)	0.445*** (0.000)	0.328*** (0.000)	0.412*** (0.000)
Country effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

(continued)

Table 7 (continued)

Explanatory variables	Model 1: all banks	Model 2: large banks	Model 3: large banks and state	Model 4: all banks and funding fragility	Model 5: large banks and funding fragility	Model 6: all banks and none-interest	Model 7: large banks and none-interest	Model 8: all non-US banks	Model 9: large non-US banks
Number of observations	188	138	138	188	138	188	138	173	122
Number of instruments	282	205	205	282	205	282	205	259	181
<i>P</i> -value for Sargan test of overidentified restrictions	0.5497	0.7975	0.7977	0.7091	0.9022	0.7674	0.8986	0.3538	0.7336

The panel data regressions estimate the relation between stock returns over the period of 2007–2008 and bank characteristics. The sample includes 102 banks from Bankscope with returns computed using data from Bloomberg and Datastream. Banks are included in the sample if they have a loan-to-asset ratio larger than 10% and a deposit-to-asset ratio larger than 20%. The sample of large banks includes public banks with assets larger than \$50 billion. Returns are in percent. Bank-level characteristics are computed using data for pre-crisis period, 2005–2006. All the regressions control for country fixed effects. *, **, and *** indicate statistical significance at the 10, 5, and 1% level, respectively. Bank-level characteristics, risk measures, regulatory and institution variables, and ownership are described in [Appendix](#)

Table 8 Panel regressions (GMM) with regulatory and macroeconomic variables (2007–2008)

Explanatory variables	Model 1: all banks	Model 2: large banks	Model 3: large banks with regulation	Model 4: all banks and funding fragility	Model 5: large banks and funding fragility	Model 6: all banks and none-interest	Model 7: Large banks and none-interest	Model 8: all non-US banks	Model 9: large non-US banks
Constant	1.460* (0.054)	1.253 (0.110)	−0.243 (0.726)	1.229* (0.102)	1.449* (0.060)	1.263 (0.115)	0.995 (0.176)	1.432* (0.061)	−0.004 (0.996)
Deposit/assets	0.053 (0.740)	0.260* (0.063)						0.136 (0.396)	0.380*** (0.005)
Loan/assets	0.016 (0.955)	−0.086 (0.748)		0.051 (0.855)	−0.074 (0.773)	0.228 (0.373)	−0.383* (0.065)	−0.167 (0.593)	−0.037 (0.901)
Net income/total assets	2.610 (0.661)	5.091 (0.455)		−2.867 (0.497)	0.874 (0.861)	−6.095 (0.151)	2.103 (0.646)	−2.730 (0.571)	8.313 (0.150)
Tier 1 ratio	−0.469 (0.414)	−0.531 (0.388)		−0.429 (0.449)	−0.180 (0.761)	0.096 (0.858)	−0.167 (0.743)	−0.997* (0.086)	−0.569 (0.361)
Tangible equity	−1.224 (0.381)	−0.134 (0.912)							
2005–2006 return	−0.284*** (0.000)	−0.368*** (0.000)		−0.274*** (0.000)	−0.358*** (0.000)	−0.294*** (0.000)	−0.390*** (0.000)	−0.230*** (0.000)	−0.404*** (0.000)
Liquid assets	0.122 (0.632)	−0.036 (0.880)		0.205 (0.419)	0.021 (0.928)	0.186 (0.473)	−0.315 (0.135)	0.072 (0.786)	0.019 (0.937)
Funding fragility				−0.213 (0.194)	−0.329** (0.035)	−0.523*** (0.000)	−0.315*** (0.005)		
Log(assets)	−0.024** (0.029)	−0.017* (0.097)		−0.023** (0.037)	−0.018* (0.069)	−0.011 (0.291)	−0.011 (0.279)	−0.029** (0.022)	−0.014 (0.192)
Other earning assets	−0.000 (0.999)	0.031 (0.449)		0.002 (0.956)	0.018 (0.645)	0.026 (0.172)	−0.003 (0.806)	−0.021 (0.684)	0.003 (0.929)
Income diversity	−0.148 (0.170)	−0.067 (0.497)		−0.132 (0.216)	−0.051 (0.600)			−0.028 (0.816)	0.086 (0.454)
Non-interest income						−0.012 (0.930)	0.081 (0.484)		

(continued)

Table 8 (continued)

Explanatory variables	Model 1: all banks	Model 2: large banks	Model 3: large banks with regulation	Model 4: all banks and funding fragility	Model 5: large banks and funding fragility	Model 6: all banks and none-interest	Model 7: Large banks and none-interest	Model 8: all non-US banks	Model 9: large non-US banks
Equity volatility	-3.183*** (0.000)	-1.138 (0.123)		-3.024*** (0.000)	-0.739 (0.320)	-2.452*** (0.001)	-0.570 (0.434)	-1.521** (0.033)	-0.801 (0.305)
Beta	0.019 (0.170)	-0.025 (0.573)		0.022 (0.118)	-0.045 (0.278)	0.022 (0.120)	-0.015 (0.695)	0.023* (0.106)	-0.017 (0.702)
Log Z	-0.051*** (0.002)	-0.032* (0.069)		-0.051*** (0.002)	-0.030* (0.081)	-0.062*** (0.000)	-0.034** (0.036)	-0.040** (0.023)	-0.029 (0.113)
Ownership	-0.029 (0.704)	-0.110 (0.132)		-0.024 (0.743)	-0.114 (0.108)	-0.034 (0.664)	-0.101 (0.142)	0.027 (0.742)	-0.0705 (0.357)
Official	-0.020** (0.025)	-0.016** (0.043)	-0.003 (0.628)	-0.020** (0.020)	-0.013* (0.069)	-0.022** (0.021)	-0.007 (0.307)		
Capital	0.054*** (0.000)	0.018* (0.109)	0.011 (0.318)	0.052*** (0.000)	0.020* (0.054)	0.045*** (0.001)	0.023** (0.021)		
Restrict	0.011 (0.206)	0.023*** (0.006)	0.028*** (0.000)	0.010 (0.228)	0.022*** (0.008)	0.011 (0.197)	0.021*** (0.008)		
Private monitoring	-0.035** (0.019)	-0.016 (0.242)	-0.024* (0.078)	-0.035** (0.018)	-0.020 (0.131)	-0.039** (0.013)	-0.015 (0.200)		
Institution	-0.255*** (0.000)	-0.150*** (0.003)	-0.137*** (0.004)	-0.219*** (0.000)	-0.143*** (0.000)	-0.198*** (0.001)	-0.153*** (0.001)		
Current account	-0.618 (0.144)	-0.391 (0.333)	-0.086 (0.798)	-0.669 (0.113)	-0.414 (0.288)	-1.033** (0.018)	-0.460 (0.204)	-1.159*** (0.003)	-0.790** (0.037)
Log GDP	-0.052 (0.184)	-0.063 (0.178)	-0.004 (0.919)	-0.044 (0.259)	-0.072 (0.119)	-0.055 (0.184)	-0.067 (0.124)	-0.013 (0.760)	0.077 (0.171)
GDP Growth	1.537 (0.245)	1.301 (0.343)	3.566*** (0.003)	1.952* (0.109)	1.096 (0.415)	1.834 (0.159)	0.946 (0.443)	4.142*** (0.000)	1.894* (0.066)
Lag(return)	0.361*** (0.000)	0.409*** (0.000)	0.400*** (0.000)	0.355*** (0.000)	0.416*** (0.000)	0.388*** (0.000)	0.499*** (0.000)	0.332*** (0.000)	0.343*** (0.000)
Country effects	No	No	No	No	No	No	No	No	No
Number of observations	188	132	132	188	132	188	138	188	122
Number of instruments	280	196	196	280	196	282	205	265	181
P-value for Sargan test of overidentified restrictions	0.1732	0.7952	0.6780	0.1376	0.6922	0.4382	0.7848	0.0736	0.6633

The panel data regressions estimate the relation between stock returns over the period of 2007–2008 and bank characteristics. We also control for regulatory and macroeconomic effects. The sample includes 102 banks from Bankscope with returns computed using data from Bloomberg and Datastream. Banks are included in the sample if they have a loan-to-asset ratio larger than 10% and a deposit-to-asset ratio larger than 20%. The sample of large banks includes public banks with assets larger than \$50 billion. Returns are in percent. Bank-level characteristics are computed using data for pre-crisis period, 2005–2006. All the regressions control for regulatory and macroeconomic effects. *, **, and *** indicate statistical significance at the 10, 5, and 1% level, respectively. Bank-level characteristics, risk measures, regulatory and institution variables, and ownership are described in [Appendix](#)

Table 9 Panel regressions (GMM) with numerous estimators of ex ante risk (2007–2008)

Explanatory variables	Log(Z)				Tangible equity ($\times 10$)			
	Model 1: all banks	Model 2: large banks	Model 3: all banks and regulatory variables	Model 4: large banks and regulatory variables	Model 5: all banks	Model 6: large banks	Model 7: all banks and regulatory variables	Model 8: large banks and regulatory variables
Constant	-0.408 (0.734)	-0.904 (0.523)	-4.865 (0.121)	-1.983 (0.621)	0.988*** (0.000)	0.380** (0.016)	1.033*** (0.001)	0.829* (0.075)
Deposit/assets			-0.411 (0.498)	-0.970 (0.146)			0.0257*** (0.000)	0.156* (0.061)
Loan/assets	1.267 (0.136)	-0.251 (0.827)	3.577*** (0.000)	3.280*** (0.002)	0.023 (0.825)	0.138 (0.268)	-0.149 (0.113)	-0.177 (0.156)
Net income/total assets	-9.865 (0.616)	18.177 (0.589)	24.409 (0.159)	18.036 (0.432)	17.948*** (0.000)	20.085*** (0.000)	31.631*** (0.000)	39.958*** (0.000)
Tier 1 ratio	1.610 (0.398)	6.429** (0.041)	1.686 (0.441)	2.874 (0.286)	0.417* (0.085)	-0.502 (0.145)	0.646*** (0.003)	0.278 (0.411)
2005–2006 return	0.212 (0.349)	-0.247 (0.610)	-0.423* (0.101)	-0.745* (0.092)	0.005 (0.836)	-0.028 (0.607)	-0.047* (0.076)	-0.049 (0.400)
Liquid assets	1.337 (0.236)	-0.291 (0.844)	1.612 (0.115)	3.222*** (0.006)	-0.347** (0.016)	0.035 (0.829)	-0.179* (0.081)	-0.158 (0.273)
Funding fragility	-1.342*** (0.004)	-0.999* (0.104)			-0.268*** (0.000)	-0.321*** (0.000)		
Log(assets)	0.034 (0.469)	0.053 (0.355)	0.049 (0.279)	0.153** (0.013)	0.000 (0.900)	0.004 (0.459)	0.008* (0.068)	0.005 (0.429)
Other earning assets	0.048 (0.397)	0.017 (0.796)	0.129* (0.093)	0.070 (0.329)	-0.017** (0.013)	-0.015** (0.035)	-0.023*** (0.003)	-0.019** (0.037)
Income diversity	0.045 (0.908)	0.230 (0.680)	0.174 (0.697)	0.255 (0.618)	-0.017 (0.734)	0.049 (0.408)	-0.046 (0.323)	-0.059 (0.355)
Ownership	-1.147*** (0.000)	-1.707*** (0.000)	-0.777** (0.012)	0.058 (0.125)	-0.112*** (0.000)	-0.005 (0.145)	-0.062** (0.043)	-0.068* (0.103)
Official			0.050 (0.130)	0.072 (0.211)			-0.009** (0.013)	-0.011** (0.031)
Capital			0.015 (0.783)	-0.081* (0.084)			0.001 (0.809)	-0.000 (0.960)
Restrict			0.119 (0.102)	0.197 (0.107)			0.000 (0.926)	0.005 (0.316)
Private monitoring			0.0006 (0.992)	-0.197*** (0.007)			-0.014** (0.043)	-0.021** (0.017)
Institution			0.573** (0.014)	0.561** (0.022)			-0.125*** (0.000)	-0.149*** (0.000)
Current account			-0.825 (0.603)	3.265* (0.078)			-0.406** (0.011)	-0.619*** (0.006)
Log GDP			-0.083 (0.548)	0.343* (0.067)			-0.017 (0.295)	0.037 (0.210)
GDP growth			13.060** (0.010)	6.176 (0.314)			2.307*** (0.000)	-1.997** (0.011)
Log(Z)	0.002 (0.958)	-0.018 (0.769)	-0.011 (0.839)	0.046 (0.479)	-0.0414 (0.214)	-0.1206*** (0.007)	-0.603* (0.071)	-1.056* (0.056)
Country effects	Yes	Yes	No	No	Yes	Yes	No	No

(continued)

Table 9 (continued)

Explanatory variables	Log(Z)				Tangible equity ($\times 10$)			
	Model 1: all banks	Model 2: large banks	Model 3: all banks and regulatory variables	Model 4: large banks and regulatory variables	Model 5: all banks	Model 6: large banks	Model 7: all banks and regulatory variables	Model 8: large banks and regulatory variables
Number of observations	188	138	188	138	188	138	188	138
Number of instruments	281	204	281	204	281	205	282	205
<i>P</i> -value for Sargan test of overidentified restrictions	0.1633	0.790	0.3074	0.7928	0.6700	0.7994	0.3821	0.9021

The panel data regressions estimate the relation between various measures of ex ante risk over the period of 2007–2008 and bank characteristics. The sample includes 102 banks from 33 countries with returns computed using data from Bloomberg and Datastream. Banks are included in the sample if they have a loan-to-asset ratio larger than 10% and a deposit-to-asset ratio larger than 20%. The sample of large banks includes public banks with assets larger than \$50 billion. Bank-level characteristics are computed using data for pre-crisis period, 2005–2006. The measures of ex ante risk are *distance to default* which is the log of the distance to default measures calculated as bank's ROA plus the capital-to-asset ratio divided by the $\sigma(\text{ROA})$ over the period 1996–2007, and *tangible equity* defined as equity minus intangible assets whenever available or equity when intangible assets are not available, divided by total assets. The regressions control for country fixed effects or regulatory and macroeconomic effects. *, **, and *** indicate statistical significance at the 10, 5, and 1% level, respectively. Bank-level characteristics, regulatory and institution variables, and ownership, are described in [Appendix](#)

shareholder) and bank performance was found to exist. However, the ownership is strongly negatively correlated with bank risk taking prior to the crisis. Previous research of the crisis also emphasizes the run on the funding of banks that relied on short-term finance in the capital markets for a substantial fraction of their financing. In line with this hypothesis, we would expect banks that rely on short-term finance before the crisis to perform poorly during the crisis. No systematic evidence of such relationship exists even for the group of large banks. However, we find that banks with more deposits and less funding fragility did perform better during the crisis. Our results hold even when we control in our regressions for regulatory and macroeconomic effects.

Numerous papers also pointed out that capital adequacy played an important role in making the crisis as serious as it was. For example, Demirgüç-Kunt et al. [7] claim that capital was not the major cause of the crisis, but it became important, specifically for the largest banks, during the crisis. Surprisingly, we find only weak evidence that some banks performed poorly during the crisis because of the lack of adequate capital. Another strand of literature (see [8, 9]) argues that regulators and supervision bodies failed in their efforts to strengthen the regulations on the excessive amount of risk taking and the heavy reliance on off-balance sheet products. Beltratti and Stulz [5] find that large banks that

come from countries with more restrictions on bank activities in 2006 fared better during the crisis. Using a different sample of banks, we find strong evidence in support of this hypothesis. However, no systematic evidence exists that such restrictions made banks less risky before the crisis. Other regulations such as the index of official supervisory power and private monitoring had a significant impact on bank risk behavior during the crisis.

We observe significant difference in regulation impact on bank behavior across different groups of banks. While official supervisory index, private monitoring and capital regulations play a significant role in explaining the bank performance across all groups of banks, the impact of restrictions on bank activities is significant only in the sample of large financial institutions. Further, we estimate the determinants of bank performance after the crisis of 2007–2008. Bank characteristics such as deposits, tangible equity and income diversity are important determinants of bank behavior after the crisis. We also investigate the relation between the post-crisis return and regulatory variables, and find that the index of official supervisory power and the restrictions on bank activities are strongly correlated with bank performance. This is a clear indication of the increased power of bank regulations after the crisis. Further research should attempt to examine how market discipline interacts with regulatory pressure to affect bank capital and risk-taking.

Appendix

See Table 10

Table 10 Dependent and explanatory variables

Variable	Explanation	Data source	Expected sign
Dependent variable			
Stock returns	Bank stock returns (currency US\$). The data is annual and covers the period 2005–2013	Yahoo Finance, Bloomberg, and Datastream	
Explanatory variables			
<i>Bank characteristics</i>			
Tier 1	Proxy for capital adequacy defined as the ratio of Tier 1 capital to risk-weighted assets	Bankscope, OSIRIS, and annual reports	+
Tangible equity	Proxy for capital adequacy defined as equity divided by total assets	Bankscope, OSIRIS, and annual reports; [5], pp. 3–8	+
Deposits	Bank characteristic calculated as deposits divided by total assets	Bankscope, OSIRIS, and annual reports	+
Tier 1 leverage ratio	Proxy for capital adequacy defined as Tier 1 capital divided by total assets	Bankscope, OSIRIS, and annual reports; [36], pp. 1152–1154	+
Funding fragility	The ratio of the sum of deposits from other banks, other deposits, and short-term borrowing divided by the total deposits plus money market and short-term funding	Bankscope, OSIRIS, and annual reports; [5], pp. 5–8	–
Loans	Bank characteristics calculated as loans over total assets	Bankscope, OSIRIS, and annual reports	+
Loan loss provision ratio	The ratio of the bank's loan loss provisions to net interest income	Bankscope, OSIRIS, and annual reports; [30], pp. 261–267	+
Liquid asset	The ratio of liquid assets to total assets	Bankscope, OSIRIS, and annual reports	+
Liquidity ratio	Proxy for liquidity position. The ratio of liquid assets divided by deposits plus short-term funding	Bankscope, OSIRIS, and annual reports	+
Other earning assets	Proxy for the asset side of the balance sheet calculated as the ratio between the sum of derivatives and other securities divided by the sum of loans and other earning assets	Bankscope, OSIRIS, annual reports; ([5], pp. 3–8)	–
Income diversity	The ratio is estimated by subtracting 1 from the ratio of net interest income minus other operating income divided by the total operating income	Bankscope, OSIRIS, and annual reports; [9], pp. 3–8; [30], pp. 261–267	–
Non-interest income	The share of operating income that is not due to interest income	Bankscope, OSIRIS, and annual reports; [5], pp. 3–8; [6], pp. 629–637	–
Non-interest ratio	The ratio defined as non-interest income divided by gross revenue	Bankscope, OSIRIS, and annual reports	–
Altman Z-score	Altman's z-score is a measure for distance to default	Bankscope, OSIRIS, and annual reports; [46], pp. 318–323	+
Z-score	Z-score is the distance to default calculated as bank's ROA plus the capital-to-asset ratio divided by the $\sigma(\text{ROA})$ over the period 1996–2007	Bankscope, OSIRIS, and annual reports; [5], pp. 3–8; [30], pp. 261–267	–
Equity volatility	Equity volatility is the standard deviation of the equity returns of the bank, estimated using annualized total returns for the year 2006 and 2007	Datastream; [30], pp. 261–267	–
Earnings volatility	Earnings volatility is the average standard deviation of the ratio of EBIT and Loan loss provisions to total assets over the period 1996–2007	Bankscope, OSIRIS, annual reports; [30], pp. 261–267	–

(continued)

Table 10 (continued)

Variable	Explanation	Data source	Expected sign
Beta	Measure for risk. The beta is defined as the measure of an asset's risk in relation to the market	Bankscope, OSIRIS, Datasream, and annual reports	–
Size	Log of bank's total assets	Bankscope, OSIRIS, and annual reports; [30], pp. 261–267	+
Total capital ratio	Proxy for capital adequacy. The ratio of other capital divided by total assets, where other capital is calculated by subtracting common equity from total capital	Bankscope, OSIRIS, and annual reports; [36], pp. 1152–1154	+
Cost of funding Earning assets ratio	The ratio of total interest expenses over average earning assets	Bankscope, OSIRIS, and annual reports	+
Other capital/RWA	Proxy for capital adequacy. The ratio of other capital divided by risk-weighted assets, where other capital is calculated by subtracting common equity from total capital	Bankscope, OSIRIS, and annual reports; [36], pp. 1152–1154	+
Current ratio	Proxy for liquidity adequacy. The ratio of current assets to current liabilities	Bankscope, OSIRIS, and annual reports	+
<i>Regulation and institution</i>			
Official	“The official supervisory index measures the degree to which the country's commercial bank supervisory agency has the authority to take specific actions. The official supervisory index has a maximum value of 14 and a minimum value of 0, where larger numbers indicate greater power”	The World Bank [47]; [45], pp. 22–25; [5], pp. 3–8	+
Capital	“The index of bank capital regulations includes information on (1) the extent of regulatory requirements regarding the amount of capital banks must hold and (2) the stringency of regulations on the source of funds that count as regulatory capital can include assets other than cash or government securities, borrowed funds, and whether the regulatory/supervisory authorities verify the sources of capital. Large values indicate more stringent capital regulations. The maximum possible value is nine, while the minimum possible value is zero”	The World Bank [47]; [45], pp. 22–25; [5], pp. 3–8	+
Restrict	“The index of overall restrictions on bank activities measures the degree to which banks face regulatory restrictions on their activities in (a) securities markets, (b) insurance, (c) real-estate, and (d) owning shares in non-financial firms. For each of these four sub-categories, the value ranges from a 0 to 4, where a 4 indicates the most restrictive regulations on this sub-category of bank activity. Thus, the index of overall restrictions can potentially range from 0 to 16”	The World Bank [47]; [45], pp. 22–25; [5], pp. 3–8	+
Private monitoring	“The private monitoring index measures the degree to which regulations empower, facilitate, and encourage the private sector to monitor banks. The private monitoring index has a maximum value of 9 and a minimum value of 0, where larger numbers indicate greater regulatory empowerment of private monitoring of banks”	The World Bank [47, 45], pp. 22–25; [5], pp. 3–8	+
State	State takes value 1 if the state's stake in a bank exceeds 10%	Bankscope, OSIRIS, and annual reports; [5], pp. 3–8]	+
Institution	The index of institution is the average of six indicators	[5, pp. 3–8] and [48]	+
Ownership	Proxy for governance control. Ownership is defined as the level of ultimate ownership of the biggest stockholder	Bankscope, OSIRIS, and annual reports; [5, pp. 3–8]	+
<i>Macroeconomic variables</i>			
Log GDP	The log of GDP per capita (current \$), proxy for market size	The WBDI, 2004–2013 [15]	+
GDP growth	Annual percentage growth rate of GDP (constant 2005 U.S. dollars), proxy for market size	The WBDI, 2004–2013 [15]	+
Current account	Current account is the ratio between the current account deficit and GDP for 2007 and 2008	The WBDI, 2004–2013 [15]	+
Inflation	Inflation is measured by the consumer price index, in percent	The WBDI, 2004–2013 [15]	+

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Significance of Education, Emotional Intelligence, Experience and Mediating Role of Ethical Values in Exceptional Executive Excellence

Tahir Masood Qureshi

Abstract

Professionals working in different segments of life either work to achieve some vision or struggle to survive. Those who have set their vision earlier in life may achieve it sooner or later but those who work without setting vision remained either low or under potential achievers. We believe that education, engagement, emotional intelligence and experience in combination with ethical values as mediator plays significant role in success of high achievers. Using convenient sampling technique primary data through self-administered questionnaire was collected from working professionals in GCC. Correlation and regression analysis were used to analyze data. It has been identified that all the selected variables are having significant impact on exceptional executive excellence and ethical values mediates relationship amongst variables. Study findings suggests the professionals to be clear in their career vision and maintain a good balance of positive ethical values, education, rich experience and work engagement to reach at career apex by achieving desired legitimate objectives.

Keywords

Emotional intelligence • Ethical values • Career development

1 Introduction

Career development is lifetime progression that starts from choosing a career and selecting workplace. At workplace people have different targets, some strive for excellence while others struggle for survival, however the ultimate target for majority is achieving financial and social stability.

T. M. Qureshi (✉)
American University in the Emirates, Dubai,
United Arab Emirates
e-mail: tahir.masood@ae.ae

Those who want to accomplish incredible in life are target and career-oriented professionals. This target setting approach make them able to achieve desired goals. In professional world few people achieve their goals in lesser amount of time and the others spend complete life to achieve them.

There are few factors that plays very important role to achieve the desired goals in life, such as education, experience, emotional intelligence, work engagement and ethical values. As a gateway to success education inculcate professionals the knowledge, skills and competence. They develop certain skills during schooling age that decide their career. Secondly experience plays exceptionally significant role in increasing capability of a person in desired profession. It is important for individuals to be at right track for achieving relevant experience that makes them capable to achieve their objectives. Thirdly employee engagement determines the career of individuals, this concept emerged from the positive psychology movement in which researchers began to focus on understanding the factors that can lead to and sustain positive human behaviors and the related positive consequences of those behaviors [1]. The involvement level of an individual is the use of his mind about tasks, behavior at work and emotions effected by surroundings [2]. Fourth factor is employees' emotional intelligence that determines the ability of an individual to face certain situation in the work setting, further its help individuals to cope with stress and well-being in the form of creativity [3]. Senior management and individuals exercising authority practice emotional intelligence to develop trust with subordinates and bring harmony in work place. These outcomes improve performance which is considered as success for a leader. Understanding and respecting others' emotions and feelings helps them in determining their goals and interests in the society. Finally, Ethical values plays a key role for making a person capable of achieving the desired goals in life in legitimate way. These values are vital in every field of life and are important in determining whether a person is doing job honestly or not. Based on

literature review, observations and tag line “Achieving smart professional status is dream of professionals” the main purpose of this study, analyzing the contribution of education, experience, emotional intelligence, engagement and ethical values in exceptional executive excellence is developed.

2 Literature Review

Experience plays a very important role in bringing excellence in any form of work a person strive to accomplish in professional career. It plays very important role to bring excellence in executives' life. Reference [4] stated that the highly experienced employees are the biggest resource for organization to increase growth, profitability and market share. There are many things that plays vital role in increasing experience of the employees, most of them are related to the workplace. Workplace environment, organization culture, individual goals, personal motivation, intensity of competition, leadership styles, and self-efficacy of employees plays a decisive role in developing and bringing experience in professional life of an employee. The culture of the organization plays a very important role in increasing the performance of employees. It can be defined as the combination of believes, values, and norms [5]. The culture and environment play very important role in directing the employees towards the development and growth. If the organizational culture is favorable and supportive, then it develops employee capabilities to increase the performance.

Organization plays very important role to increase employees' performance by setting higher goals for them, that results in developing the employees. Organization can adopt many techniques to increase employee performance, one of these techniques is employee engagement. It plays very significant part in increasing employees performance by developing ownership feeling and motivating them to achieve their goals [6]. Reference [7] have highlighted that by respecting employee goals organization can increase the performance of employees that ultimately contributes towards higher organizational performance. Many studies are conducted about employee engagement, work engagement, and organization engagement [8]. Employee engagement is defined as an active, work-related positive psychological state [9, 10]. It is also defined as the effort of individuals in their work/tasks [11]. According to [12] employee engagement is reflective of an active psychological state and inclusive of the full spectrum of immediate work experience. Employee engagement in work depends on other factors like organizational relations, culture and leadership support. It is also discussed in association with other variables that decides the level of employees performance. Engagement is further defined as empowerment, whereas

empowerment means, employees control over adjustments and decision making related to work tasks and the accomplishment of tasks [13]. When employees are more involved into work they take decisions regarding their responsibilities. Engagement is the level of energy and decision making that employees take on their own responsibility to solve problems [14]. This behavior makes employees more accountable about their work and improves their ability to perform better. Sense of belongingness and employee satisfaction also determines the level of employee engagement at work. Employees when feel satisfied with their job positions and work they tend to act more loyal to the organizational goals and are more expressive and open to organization [15]. When employees feel belonged to their work place, intentions to leave the organization reduce [16]. Engagement studies with respect to outcomes explain that it is an indirect phenomenon that determines the success of individual and organization. Engagement is associated with outcomes like higher satisfaction, performance, commitment, loyalty and reduced turnover; engagement is also related to the reduced burnout of employees in the organization. Leadership style practiced in the organization also determines the excellence of an employee. In terms of employee engagement, employees feel more comfortable in the organization when leadership practices are supportive. Ownership of work develops positive attitude and motivation in employees. Motivated employees perform well in their work when they are engaged to it. Sense of ownership developed in employees leads to development of employee in character and behavior. Individuals who are cut off from their work show less concern to their performance. Reference [17] found that perceived organizational support of employees led by fairness, support of head, working facilities creates good performers who are committed to the organization. Organizational support theory explains such behavioral development in the organization.

Emotional intelligence is a personality trait of an individual [18], in previous literature it is discussed as the ability of individual to face and handle certain situation [19]. Emotional intelligence is a behavior and ability of a person that enhances employee well-being and creativity [3]. The ability to smoothly perform duties together with colleagues and handle one's own emotions has become important not only for individuals' lives but also for success in professional career in organization [20], because even talented people with excellent intellectual capabilities hinder business success due to lack of devotion and loyalty [21], over the time it has become a criterion of employee desirability. People with high level of emotional intelligence can communicate their message to others properly. In some organization managers manage employees using social skills [22], an individual with good social skills is more likely to respond situations and issues amicably and reduce the negativity of conflicts. Paying

attention to employees' emotional intelligence has been known to help employees endure stress in fiercely competitive organizational environments, enhance loyalty to the firm and share positive energy with colleagues to achieve goals. Employees with high EI are quick to understand the requirements and values of stakeholders, manage their stress and crises well, have good relations with others and are emotionally stable thus are satisfied at job [20]. Empirical reviews have claimed strong relationship between job performance and self-reported emotional intelligence [23]. Individual with high emotional intelligence are more committed to their work and are highly satisfied with their job and responsibilities furthermore emotional intelligence reduces negative impact of work related conflicts and intentions to leave the organization [21]. That is why emotional intelligence is discussed as the source of success for professionals [24].

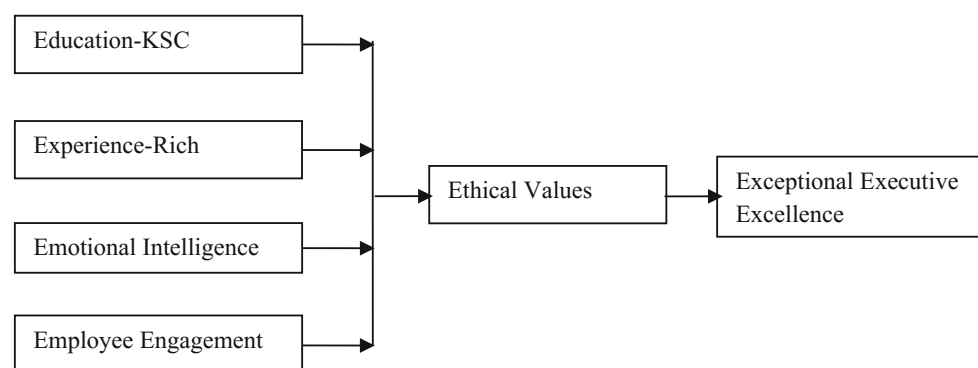
Education plays an important role in the development of individuals, however it depends on how much knowledge one grasps and shares with the community and society. By expressing knowledge and gathering information an individual personality develops at fast track. Schooling and initial learning of an individual decides the most prominent feature "leadership" of personality. Education level achieved by an individual depends on the level of his growth, family support and his own motivations to learn and share new things for self-development. Learning oriented people are more inclined towards getting new knowledge and using it for good. Goal theory explains one internal motivation towards learning, learning oriented employees believe that gathering information about latest processes and activities will help them improve performance, while performance-oriented employees believe that performing excellence and ability to dominate are the steps towards growth and development. Educated employees feel that they need to continuously upgrade their knowledge and professional capacity through professional development [24]. In this study education is defined as learning process that develops contemporary knowledge, seasonal skills and required attitude.

Ethical values are one of the most important components of human life. They can be termed as the rules of conduct that creates the difference between human and a valuable human. These values may differ in different cultures and nation; however they play very important role to increase the chances of individual's professional growth and success. Like other qualifications ethical values are mandatory for individuals to grow professionally, in the field of business these values are treated as one of the essential components. Ethical values are defined almost in all areas of business including finance, human resource management, marketing and production etc. in business rules of the action to perform any business activity are called ethical values, furthermore ethical values are defined as set of rules and procedures to be followed in business world to avoid all unethical and illegal activities. In this study Ethical values means by avoiding illegal activities staying with promises for the satisfaction of stakeholders.

Professional excellence has crucial value in developing innovative products and bringing balance in product development process. By increasing employees learning organization can increase workers excellence [25, 26]. Professional excellence is not only important for the individuals but equally integral for higher organizational performance. To develop consumer satisfaction and bring value in the products and services offered, professional excellence plays key role to achieve these goals. For bring excellence, rich experience is very important and experience comes through practice [27]. In this study experience means rich experience, where one is having more experimentations and different learnings rather than repeating same activities again and again.

Based on observation, comprehensive literature review and gap identification following theoretical model and propositions are developed to study contribution of each selected variables (Education, Experience, Emotional Intelligence, Employees Engagement) along with mediatory role of ethical values towards Exceptional Executive Excellence (Fig. 1).

Fig. 1 TMQ exceptional performance model-1



Proposition 1: Education, Experience, Employees Engagement and Emotional Intelligence are significantly related with Exceptional Executive Excellence.

Proposition 2: Education, Experience, Employees Engagement and Emotional Intelligence are having significantly positive impact on Exceptional Executive Excellence.

Proposition 3: Ethical Values mediates relationship among Education, Experience, Employees Engagement, Emotional Intelligence and Exceptional Executive Excellence.

organizations can achieve next level of performance in competitive business world. This study is non-contrived, cross sectional, causal and co relational in nature. All quick growth achievers are population for the study, however study concentrates only on GCC banking, insurance and leasing sectors. Sample size consists of 200 elements including Chief Executive Officers, Chief Information Officers, Chief Financial Officers, Directors and Managers. Using seven five-point Likert scale questionnaire containing two parts; first related to demographics and second covering all variables was used for primary data collection. People were contacted using email addresses and after several reminders 150 responded back.

3 Research Methodology

Based on literature review four independent variables (Education, Experience, Employees Engagement and Emotional Intelligence), one mediating variable (Ethical Values) and one dependent variable (Exceptional Executive Excellence) are identified. In today's competitive world businesses are looking for high performing exceptional employees so that

4 Analysis and Findings

Using SPSS-21 data was analyzed, after exploring the reliability of data Cronbach's alpha ($\alpha > .07$) shown in (Table 1), led towards further analysis of relationship, impact and mediation testing (Tables 2, 3, 4 and 5).

Table 1 Data reliability

	Education	Engagement	Experience	Emotional intelligence	Ethical values	EEE	Overall reliability
Cronbach's Alpha	0.890	0.808	0.927	0.829	0.793	0.864	0.874

Cronbach's alpha for Education ($\alpha = 0.890$), Engagement ($\alpha = 0.808$), Experience ($\alpha = 0.927$), Emotional Intelligence ($\alpha = 0.829$), Ethical Values ($\alpha = 0.793$), Exceptional Executive Excellence ($\alpha = 0.864$) are indicators of data reliability that encourage and support farther analysis

Table 2 Descriptive statistics

	Education	Engagement	Experience	Emotional intelligence	Ethical values	EEE
Mean	0.425	0.402	0.411	0.407	0.409	0.458
S D	0.922	0.956	1.088	1.230	1.333	1.390
Minimum	1.000	1.112	1.224	1.902	1.700	1.546
Maximum	5.000	5.000	5.000	5.000	5.000	5.000
Count	150.0	150.0	150.0	150.0	150.0	150.0

Standard deviation (SD) of all variables are evidencing minor deviation from mean values of Education, Engagement, Experience, Emotional Intelligence, Ethical Values and EEE as 0.922, 0.956, 1.088, 1.230, 1.333 and 1.390 respectively, this data trend shows harmony and congruence

Table 3 Correlation matrix

	Education	Engagement	Experience	Emotional intelligence	Ethical values	EEE
Education	1					
Engagement	.823 ^a	1				
Experience	.564 ^a	.893 ^a	1			
Emotional Int.	.772 ^a	.866 ^a	.803 ^a	1		
Ethical Values	.711 ^a	.723 ^a	.628 ^a	.669 ^a	1	
EEE	.743 ^a	.755 ^a	.600 ^a	.739 ^a	.762 ^a	1

^aCorrelation is significant at the 0.05 level (2-tailed)

Significance correlation between (EEE and Education— $r = .743$), (EEE and Engagement— $r = .755$), (EEE and Experience— $r = .600$), (EEE and Emotional Intelligence— $r = .739$), (EEE and Ethical Values— $r = .762$) is identified. Results are supporting first proposition of the study related with significantly positive relationship amongst tested variables

Table 4 Regression analysis

	Standardized β	Adjusted R^2	ΔR^2	Sig.
Education	.222	.123	.119	.002
Employees engagement	.345	.121	.069	.009
Experience	.231	.118	.107	.001
Emotional intelligence	.301	.122	.071	.004

Regression analysis results for each variable are indicating significant contribution towards Exceptional Executive Excellence. Education ($\beta = .222$, $R^2 = .123$ and $p = .002$), Employees Engagement ($\beta = .345$, $R^2 = .121$ and $p = .009$), Experience ($\beta = .231$, $R^2 = .118$ and $p = .001$) and Emotional Intelligence ($\beta = .301$, $R^2 = .122$ and $p = .004$) are significantly contributing towards Exceptional Executive Excellence, therefore proposition 2 is fully accepted

Table 5 Mediation analysis—ethical values as mediator

		Standardized β	Adjusted R^2	ΔR^2	Sig.
Step 1 Mediation					
	Ethical values	.413	.311	.263	.000
Step 2 Other variables					
	Education	.311	.143	.028	.109
	Employee engagement	.212	.139	.122	.094
	Experience	.290	.114	.090	.022
	Emotional intelligence	.390	.162	.099	.107

In the first step mediating variable ethical values are entered and in second step all other variables are entered in the equation. As per [28] recommendations, the results supported third proposition. Main effect size and variance are reduced almost for all the variables, Education ($\beta = .222$, $p = .002$, $\Delta R^2 = .119$ to $\beta = .311$, $p = .109$, $\Delta R^2 = .028$), Employees Engagement ($\beta = .345$, $p = .009$, $\Delta R^2 = .069$ to $\beta = .212$, $p = .094$, $\Delta R^2 = .122$), Experience ($\beta = .231$, $p = .001$, $\Delta R^2 = .107$ to $\beta = .290$, $p = .022$; $p = .001$ to $\Delta R^2 = .090$) and Emotional Intelligence ($\beta = .301$, $p = .004$, $\Delta R^2 = .071$ to $\beta = .390$, $p = .107$, $\Delta R^2 = .099$). Thus, after controlling the effect of ethical values as mediator main effects were substantially changed, therefore forth proposition is proven too

5 Conclusion and Recommendations

GCC region is growing swiftly because of near future events such as Expo 2020, Football world cup 2022 and fast expansions of other industries. Traditionalist are getting retired and businesses are getting expansions, therefore companies require millennials with competitive business skills to reach the highest profit levels. From the entire world individuals are moving to this region for better employment and earning opportunities, this flow is creating perfect competition in the job market. Individuals having competitive skills are indeed highly demanded in this market like in the entire world. This study explored the relationship and impact of well researched variable with career development and ultimately for competitive performance termed as exceptional executive excellence. Results indicated that the individuals having good education, relevant rich experience, commitment with work, emotional intelligence following ethical values are reaching on top positions early in the career. People interested to pursue their career with an intention to reach to highest level in the professional life

needs to have vision and follow the recipe concluded in this study will be attaining exceptional executive excellence in the corporate world comparatively early and with confidence as compare to other candidates who grow in the corporate sector with market follow. This study is only covering financial companies operating in GCC region, same model can be tested in other parts of the world to find out essential factors for fast career development and growth.

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Smart Art for Smart Cities

Heather Shipman 

Abstract

The concept of a smart city primarily refers to infrastructure and the ways that various systems can be integrated using technology. However, an integrated and efficient city does not constitute a livable city, where citizens are stimulated and inspired to remain. This study surveys successful smart art installations and applications, which can contribute to a sense of community and cultural expression, often targeting attributes such as accessibility, sustainability, and wayfinding. Smart art utilizes interaction and input to obtain statistics which enable real-time adaptivity, therefore engaging the user, giving them a sense of involvement and uniqueness in a potentially homogenous and controlled environment. The role of artistic and creative solutions in urban smart projects will be examined, in the context of permanent or long-term installations/solutions, rather than short-term exhibitions.

Keywords

Design • Smart art • Interactivity

1 Introduction

We are social animals, ones that thrive through creative activities. Concepts like ‘data sharing’, ‘internet of things’ and ‘augmented reality’ don’t mean much unless they are translated into relatable scenarios, ones where we can picture how they might impact our own lives, as well as those of our friends and family. [1]

In the 2017 ranking of the smartest cities in the world by the IESE Cities in Motion Index, none of the world’s “from the ground up” smart cities, such as Songdo in South Korea, made the list. It is interesting to observe that while these

types of communities may be advanced in areas such as sustainability and integration of services, people don’t seem to want to actually *live* there: Masdar City in Abu Dhabi, UAE, had a mere 300 residents in 2016. In addition, while traditional cities that have implemented “smart” technologies and services fared better, all of the highest ranking cities had poor social cohesion scores.

What then, is the challenge that we are facing in regard to making smart cities not only integrated and efficient, but livable? [2], of the urban consultancy Umbrellium, pointed out that the corporate smart-city rhetoric was all about efficiency, optimization, predictability, convenience and security. “You’ll be able to get to work on time; there’ll be a seamless shopping experience, safety through cameras, et cetera. Well, all these things make a city bearable, but they don’t make a city valuable.” In her paper, “*A City is Not a Computer*,” [3] makes a case for the importance of site-based experience. One can’t “process” the local cultural effects of long-term weather patterns or derive insights from the generational evolution of a neighborhood without a degree of sensitivity that exceeds mere computation. Urban intelligence of this kind involves site-based experience, participant observation, sensory engagement. As mentioned in [4], Experience-driven design has been defined as: (1) Taking human experiences as a starting point; “valuing the whole person behind the ‘user’” and focusing on the key design elements: context, interpretation, participation, (2) Using the targeted experience, and stories around them, as central concepts of the design vision. Sharing common experiences enables residents to generate a sense of ownership in their community and its history: Art and culture are essential components for generating these experiences.

Smart technologies, while efficient, can come across as “cold.” At the Smart City Expo World Congress in 2015, much of the discussion revolved around the idea that smart cities are not truly sustainable unless they equip their citizens with the tools they need to contribute to civic life. The conference emphasized putting people and citizen participation at the center of the smart city movement. Keynote

H. Shipman (✉)
American University in the Emirates, Dubai,
United Arab Emirates
e-mail: heather.shipman@ae.ae

speaker [5] reinforced this point, indicating that smart cities aren't just about technical solutions—they're about serving people. By integrating an element of participation, residents can feel they have a vested interest in their community; that their opinion or input matters. In addition, visitors will have a more personalized experience, increasing the potential to recommend the location to others. Adding customizable elements to concepts such as tourism, social responsibility, accessibility, safety, sustainability, and wayfinding is a means to achieve these goals.

2 Methodology

Although most would likely define art through its most common application of the visual or performing arts, art can also be defined as creative solutions, and the use of imagination to arrive at these solutions. "Smart Art," or, art which utilizes interaction and input to enable real-time adaptivity, is one method of engaging the viewer in a fun and attention-grabbing way. Tom Cheesewright, one of the UK's leading futurist speakers, believes that the answer to maintaining these standards of behavior, interaction and collaboration lies in the interfaces. By creating an interactive experience, seemingly mundane urban concepts, spaces, and objects suddenly become entertaining. In this survey, long-term, public installations which serve one or more of the aforementioned purposes were considered, rather than cases such as an interactive piece of art in an exhibition.

3 Case Studies

3.1 Tourism

India is pioneering this idea to coincide with Gandhi's 150th birth anniversary in 2019. Dr. Subodh Kerkar of the Museum of Goa is developing a smart art project—Virtual Gandhi—to generate interest in the activist with the younger generation. In collaboration with a Ukrainian computer engineer, Kerkar is documenting Gandhi sculptures from Goa and Maharashtra, taking thousands of photos of each one, to digitize them into 3D images. After downloading an app, one can view these virtual sculptures, along with inspirational quotes, on a smartphone by scanning the local currency. Kerkar hopes to eventually link the app to every currency in the world: "Gandhi will no longer be a statue you just walk past without thinking twice."

Another such interactive experience was installed during the FutureEverything festival in Singapore in 2015: Hello Lampost allowed passers-by to SMS and "chat" with almost 700 objects around the city, including statues, landmarks, and street furniture. Singaporeans and festival-goers were able to interact

with their environment in new ways, sharing stories and memories, as well as leaving comments and suggestions for the future. The conversations were later analyzed to generate insight into public opinion regarding this type of technology.

3.2 Social Responsibility

While behavior modification is not typically a concept that one would associate with fun, "The thought that something as simple as fun is the easiest way to change people's behaviour for the better" is the premise behind Volkswagen's Fun Theory Initiative. The Fun Theory Award is a competition in which participants submit creative solutions which encourage people to think differently about everyday tasks and occurrences.

For example, American Kevin Richardson invented a fun (and profitable) way to encourage drivers to obey the speed limit with his concept of The Speed Camera Lottery. As in a typical speed camera setup, speeders have their picture snapped and are issued a citation. In this instance, however, non-speeders also have their picture snapped, and are entered into a lottery to win money generated from the speeders' fines. Within three days of implementing the lottery in Stockholm, Sweden, the Swedish National Society for Road Safety saw the average speed drop from 32 to 25 km/hr—a thirty-percent reduction.

Another innovative project resulting from the Fun Theory Initiative was the Piano Staircase. Overnight, technicians in Stockholm, Sweden installed a functional keyboard on the staircase of the Odenplan subway station. Not only did curious commuters give it a try, many spent a considerable amount of time walking up and down the stairs just for fun. In fact, 66% more people than usual took the stairs instead of the escalator.

3.3 Accessibility

As demonstrated by Russia's nonprofit organization, [6], smart technology can also be useful for promoting social responsibility. In partnership with advertising agency Y&R in Moscow, they developed a project called, "More Than a Sign," which targeted the estimated thirty-plus percent of drivers who ignored the signs for handicapped parking spaces. The team developed holograms of people with disabilities, which appear when sensors determine that the person trying to park in the space does not have the required permit sticker. The graphic appears to come to life with audio: "What are you doing? I'm not just a sign on the ground. Don't pretend that I don't exist. Why are you surprised? This is a parking spot for the disabled." Offenders reactions were recorded and made into a short video as part of the awareness campaign.

3.4 Safety

In Washington, DC, a project called Lightweave is currently being implemented to enhance safety and wayfinding. In response to concerns over dimly-lit pedestrian underpasses, Future Cities Lab was awarded a commission to illuminate spaces in a new and interactive way. Slowly changing lighting is installed overhead, adjusting dynamically according to noise and vibrations. Traffic, trains, and other ambient sounds alter the pattern, speed and color of the installation, often generating interesting overlapping effects. In addition to illuminating the underpass area, making it more inviting and easier to navigate, the lighting also makes pedestrians more visible to traffic. In France, a similar concept is being introduced in the pedestrian tunnel leading to the Stade de France from the Stade de France RER station. Primarily installed due to safety concerns, the light display is now an interactive attraction for travelers.

3.5 Wayfinding and Sustainability

Sydney, Australia is using smart solutions as a means to engage and inform the public. Users can download an app which employs the use of proximity wayfinding technologies, such as iBeacon/Bluetooth LE, QR codes and NFC. These proximity devices sense when the user is near a point of interest and relays information, images, diagrams, directions, and so on. Particularly useful for mapping culture walks, the app is beneficial to locals and tourists alike. New digital content can be uploaded quickly and effortlessly, resulting in a highly sustainable product, as there is no need to waste energy and resources constantly updating print materials, and eliminating potential litter as a result.

4 Conclusion

Creative works such as these engage the public and make them feel connected to their environment. Studies have shown that non-stimulating environments can lead to elevated stress levels, conditions such as ADHD, and even engagement in risky behavior such as drug use. Most of the case studies, such as the Speed Camera Lottery and Hello Lampost, produce quantitative results: One of the benefits to smart technology is that it provides immediate, measurable data. In addition, there is also a large amount of qualitative data resulting from experiential and anecdotal input. In this age of social media, anything that is worthy of the public's attention is also "Instagramable." A quick search for "Piano Staircase," for example, produces several results.


According to a study conducted by [7], word-of-mouth rules (16%) when it comes to making vacation related decisions. However, social media is quickly catching up. Fifteen percent of millennials report being highly influenced by Facebook posts, and 13% name Instagram posts as a major factor. [8] reports that Facebook is one of the prime destinations for sharing life events and travel related content. 52% of users surveyed said their friend's photos inspired travel plans, and 7% post their vacation photos to social networks.

At a recent smart cities event hosted by IBM, one of its engineers joked that the company "tends to look at the pipes and then people come along and destroy all our nice optimised systems." [9], director of the Institute of the Future and author of *Smart Cities: Big Data, Civic Hackers, and the Quest for a New Utopia*, said, "Some people want to fine tune a city like you do a race car but they are leaving citizens out of the process." It is essential to incorporate a sense of participation, vibrancy, and wonder into one's surroundings; efficiency is not enough to attract people to visit or to remain. As Egyptian writer Nawal El Saadawi said, "Creativity and knowledge are two faces of the same coin."

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Social Identification, Brand Image and Customer Satisfaction as Determinants of Brand Love

Abdullah Al-Haddad 

Abstract

The emotional relationship between consumers and brands has emerged as a new field of branding. The main purpose of this study is to develop a brand love model. In addition, the interrelationships of social identification, customer satisfaction and brand image in building brand love are investigated empirically. Data were collected using a survey method and the sample was 236 mobile phone users. The model is tested by structural equations modeling (SEM). The results revealed that social identification, brand image and customer satisfaction are considered as a determinants of brand love. Moreover the finding provides a model which we can follow to build brand love. It will contribute to the scientific production in the area of brand Management.

Keywords

Social identification • Brand image • Customer satisfaction • Brand love • Mobile phone

1 Introduction

For decades, researchers have studied brand attitude and developed several concepts, such as satisfaction, brand commitment and brand loyalty. The findings from recent efforts suggest that simply satisfying consumers might not be sufficient for continuing success in today's competitive marketplace.

In recent years, phrases such as “I absolutely love this brand” or “I love this brand” are commonly used by consumers, and researchers have shown more interest in studying customer positivity behavior towards brands such as “Brand Love”.

This study attempts to explain the antecedents of brand love by examining key factors influencing the process of generating brand love. Those factors (Social identification, Brand Image, Customer Satisfaction) are articulated in a model that is assumed to be good enough to explain brand love. The variants of the proposed model are checked through structural equation modeling approach (SEM).

2 Literature Review

2.1 Brand Love

During the past decade, marketing research has investigated the concept of love. Rubin [1] defines love as “an attitude held by a person toward a particular other person, involving predispositions to think, feel, and behave in certain ways toward that other person”. Sternberg [2] proposes a triangular theory of love with three components: intimacy, passion and decision/commitment. Brands have been considered as the second most important assets for a firm after customers [3].

Brand love is a rich concept recently emerged in the field of consumer behavior. Fournier [4] reveals that consumers develop and maintain strong relationships with brands. Carroll and Ahuvia [5] define Brand love as “the degree of passionate emotional attachment a satisfied consumer has for a particular trade name”. Brand love includes passion for the brand, attachment to the brand, positive evaluation of the brand, positive emotions in response to the brand, and declarations of love for the brand.

In the literature, more factors can be found as being related to the brand love concept, such as brand loyalty [5], trust [6], self-brand integration [7], positive word-of-mouth [5, 8] and e-word-of-mouth [9].

In sum, brand love is a positive emotional toward brand that develops over time, with positive evaluations of the brand, leads to passion, and consumer will maintain this relationship over the longtime.

A. Al-Haddad (✉)
Dubai, United Arab Emirates
e-mail: alhaddadhiba@gmail.com

2.2 Social Identification

Social identification is “that part of an individual’s self-concept which derives from his knowledge of his membership in a social group (or groups) together with the value or emotional significance attached to that membership” [10]. According to social identity theory, people tend to classify themselves and others into social categories [11]. Social identification is the perception of oneness with or belongingness to a group classification. The individual perceives him or herself as an actual or symbolic member of the group [12]. Consumers choose to have relationships with brands because such relationships help them develop a sense of who they are [4].

Social identity theory continued to conceive of social identity as part of the self-concept. Previous studies in brand relationships have shown the important link between brand relationship and the concept of self [4, 7]. Marketing researchers generally agree that brand love involves the integration of a brand in a consumer’s sense of identity [5, 7, 13] by using a certain brand and demonstrating love toward it, the consumer expresses his or her self to others [6]. Vernuccio et al. [14] had confirmed the direct effect of social identity on brand love in online network-based communities.

In sum, when a brand represents values that are congruent with the consumer’s belief system, when it demonstrates characteristics that enhance the consumer’s self-image and their social substance, this relationship between the brand and the consumer can be as strong and powerful as love. Therefore, I suggest that social identification affects both brand love and brand image. Also, I hypothesize that social identification will influence customer satisfaction. Therefore:

H1: Customer’s social identification has a positive effect on brand image.

H2: Customer’s social identification has a positive effect on customer satisfaction.

H3: Customer’s social identification has a positive effect on brand love.

2.3 Brand Image

Brand image has long been recognized as an important concept in marketing [15]. According to Mao [16] brand image plays an important role in brand building. Aaker [17] defines brand image as “a set of brand association that are anything linked in memory to a brand, usually in some meaningful way” and can be defined as “the combination of the consumer’s perceptions and beliefs about a brand” [18].

On other hand, Kotler and Armstrong [19] define brand image as “a set of beliefs held about a particular brand”. Factors contributing to the development of brand image are: product attributes, the firm, the marketing mix, the individual perceptions of the brand, personal values, experience, type of brand users and context variables. Sources of image formation could be either through direct experience with the brand or brand communication [20].

Brand image was found to have positive effect on both brand love [8] and customer satisfaction [21]. Therefore, we hypothesize the following hypotheses:

H4: Brand image has a positive effect on customer satisfaction.

H5: Brand image has a positive effect on brand love.

2.4 Customer Satisfaction

Satisfaction, the core of the marketing concept, has been the key objective of marketing strategy for more than 60 years. Customer’s satisfaction has been considered one of the most important constructs [22], and one of the main goals in marketing [23]. Kotler and Clarke [24] define satisfaction as a “state felt by a person who has experience performance or an outcome that fulfill his or her expectation”. Oliver [25] offered a deeper definition of satisfaction, “the consumer’s fulfillment response”. It is a judgment that a product or service feature, or the product or service itself, provided (or is providing) a pleasurable level of consumption-related fulfillment, including levels of under- or over fulfillment.

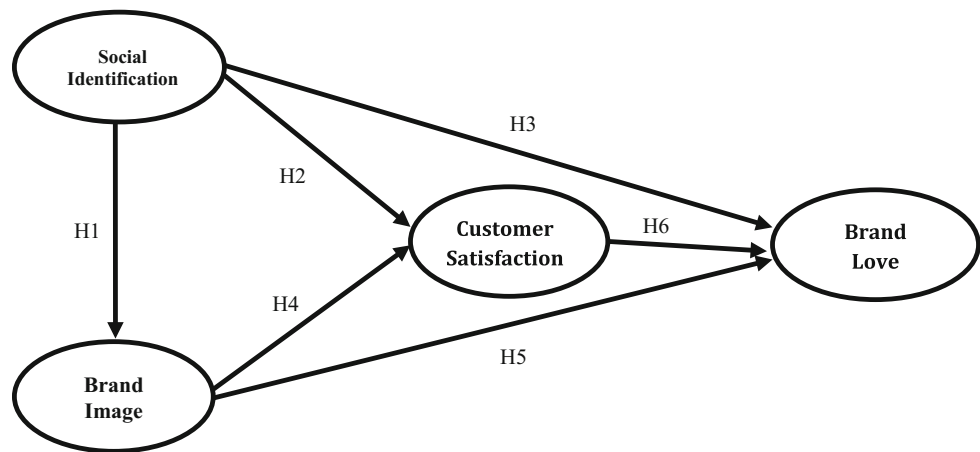
Satisfaction is not enough to keep the customers loyal. Many satisfied customers switch to competitor’s brand after some time [26]. On other hand, a percentage of the satisfied customers tend to love a brand [5]. I suggest that satisfaction over a period tends to lead to an emotional bonding between consumer and brand. Subsequently, the following hypothesis is advanced:

H6: Customer’s satisfaction has a positive effect on brand love.

3 Methodology

3.1 The Model

A research framework was designed to test the above hypothesized relationships. The model to be tested results from the hypotheses previously, are presented in Figs. 1.

Fig. 1 The research model

3.2 Sample's Definition

In order to test the proposed model we select a sample of mobile phone users who have the sufficient experience with mobile phones, A total of 250 person participated in the study. Because of missing data, 14 questionnaires had to be excluded from further analysis. 236 usable responses were obtained. Among the 236 respondents, 60.2% (N = 142) were male and 39.8% (N = 94) were female, age: less than 20 years of age, 27.1% (N = 64); 20–25 years of age, 41.9% (N = 99); greater than 25 years of age, 30.9% (N = 73).

3.3 Method of Data Obtainment

The questionnaire was designed as a survey instrument including all constructs of the proposed model to investigate the hypotheses of interest. The questions in the questionnaire are based on a review of the literatures and researches (Appendix). The survey questionnaire consists of five sections. The first section is designed to obtain sample characterization (gender and age). The second section deals with the measurement of brand love with seven items following [5]. The third section is designed to measuring social identification with six items following [27]. The fourth section deals with the measurement of customer satisfaction with three items adapted from [28]. The fifth section is designed to measuring brand image with four items following [29]. Respondents are asked to indicate their agreement level of each item of the sections on the 5-point Likert scale anchored by “strongly disagree (=1)” to “strongly agree (=5)”.

3.4 Analysis of Result

Structural equation modeling (AMOS 18) was used to test the model and hypothesis shown in Fig. 3. The model was estimated using the maximum likelihood method. A total of 6 structural paths were estimated for the model containing the 4 constructs.

A confirmatory factor analysis (CFA) was conducted, as shown in Fig. 2, to empirically test the measurement model. Multiple tests on construct validity and reliability were performed. Model fit was evaluated using the maximum likelihood (ML) method.

Construct reliability was assessed using Cronbach's α , and composite reliability (CR) using CFA. As the α -values (see Table 1) for all the constructs are greater than the guideline of 0.60, it can be concluded that the scales can be applied for the analysis with acceptable reliability [30]. CR was calculated from model estimates using the CR formula given by [31]. In the measurement model, all constructs had a CR over the cut-off of 0.70 [32]. Based on these assessments, measures used within this study were within the acceptable levels supporting the reliability of the constructs (see Table 1).

Construct validation includes content, convergent, and discriminate validities. Content validity was verified by expert judgment and by a careful literature review.

Convergent validity can be evaluated by examining the factor loadings and average variance extracted (AVE), and each CR values should be greater than its AVE values. AVE was calculated from model estimates using the AVE formula given by [33]. All estimated standard loadings (see Table 1) were higher than 0.70, and the AVE for all exceeded the

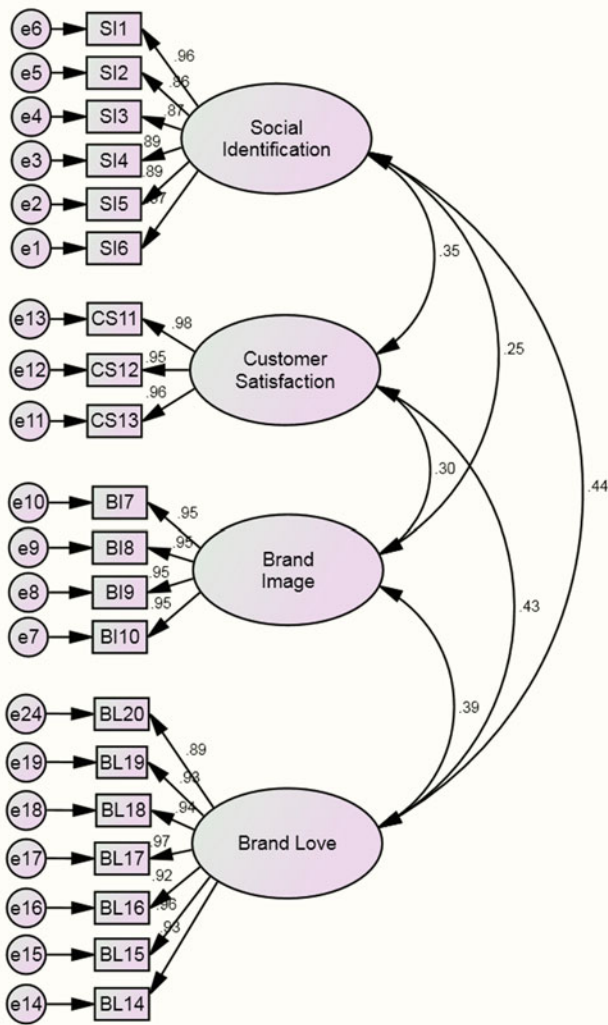


Fig. 2 Confirmatory factor analysis—CFA

recommended level of 0.50, and all of the CR values were greater than the AVE values, suggesting good convergent validity [32]. To assess the discriminate validity, Fornell and Larcker's [33] criterion, that square root of the AVE for each construct should be greater than the correlation between constructs, also maximum shared squared variance (MSV), and average shared squared variance (ASV), should be less than AVE [34]. Table 2 shows the values of the square root of the AVE were all greater than the inter-construct correlations and Table 1 shows MSV and ASV were less than AVE, suggesting good discriminate validity.

Fit indices calculated for the measurement model indicated a good fit between the structural model and data. The Chi-Square value is the traditional measure for evaluating overall model fit, Carmines and McIver [35] recommend

relative chi-square (X^2/df) of 1:3. The root mean square error of approximation (RMSEA) value below 0.08 indicates a reasonable error of approximation [36]. As suggested for an acceptable Adjusted Goodness of Fit Index (AGFI) is an adjusted measure of the Goodness of fit Index, which takes into account the degrees of freedom and values over 0.80 are seen as indicative of an overall good model fit [37]. The other fit measures like Normed Fit Index (NFI), and Comparative Fit Index (CFI) are more than 0.95 which showed a well-fitting model [38]. Also Incremental Index of Fit (IFI) and Tucker-Lewis Index (TLI) are above 0.95 which showed good fit [38]. Table 3 provides the value of the fit indices of the model.

Regarding the hypothesis tests, as shown in Table 4, all the hypothesized relationships are supported in the estimated structural model. As shown in Fig. 3, social identification has significant positive effects on brand image ($\beta = 0.25$, t -value = 3.908) customer satisfaction ($\beta = 0.29$, t -value = 4.544) and brand love ($\beta = 0.28$, t -value = 4.718). Hence, H1, H2 and H3 are supported. Furthermore, brand image also has significant positive effects on both customer satisfaction ($\beta = 0.23$, t -value = 3.611) and brand love ($\beta = 0.24$, t -value = 4.061), indicating that H4 and H5 are supported. Finally, a significant positive effect of customer satisfaction on brand love ($\beta = 0.26$, t -value = 4.300) is also found, and thus H6 is supported.

4 Conclusions and Implications

Based on the results obtained in this study, social identification has significant positive effects on customer satisfaction, brand image and brand love, which are consistent with our hypotheses. Brand image also has significant positive effects on customer satisfaction as well as brand love, which are consistent with the previous studies [8, 21]. Finally, confirming Carroll and Ahuvia [5] finding, customer satisfaction is found to have a significant positive effect on brand love. We also observe that social identification has the bigger impact on brand love ($\beta = 0.28$) when compared with, customer satisfaction ($\beta = 0.26$) and brand image ($\beta = 0.24$).

This research aims at developing a brand love model in mobile phone industry, which receives continuous attention from academic researchers and brand managers, specially there is a lack of in-depth analysis of this field.

Following the study model, brand managers must plan how to make the satisfied customers love a brand. They should use social identification and brand image to increase the positive emotional relationships with their brands. First,

Table 1 Results for the measurement model

Construct	Items	Factor loading	ASV	MSV	AVE	CR	α -values
Social identification	SI1	0.96	0.125	0.190	0.823	0.965	0.964
	SI2	0.86					
	SI3	0.87					
	SI4	0.89					
	SI5	0.89					
	SI6	0.97					
Brand image	BI7	0.95	0.103	0.154	0.903	0.974	0.974
	BI8	0.95					
	BI9	0.95					
	BI10	0.95					
Customer satisfaction	CS11	0.98	0.133	0.187	0.929	0.975	0.964
	CS12	0.95					
	CS13	0.96					
Brand love	BL14	0.93	0.177	0.190	0.874	0.980	0.98
	BL15	0.97					
	BL16	0.92					
	BL17	0.97					
	BL18	0.94					
	BL19	0.93					
	BL20	0.89					

Table 2 Correlations and square root of the AVE

	Social identification	Customer satisfaction	Brand love	Brand image
Social Identification	0.907			
Customer satisfaction	0.347	0.964		
Brand love	0.436	0.433	0.935	
Brand image	0.254	0.303	0.392	0.950

Table 3 Measurement model fit indices

Fit indices	Recommended value	Value indices
$X^2/(df)$	1:3	1.986
AFGI	≥ 0.80	0.85
NFI	≥ 0.95	0.95
CFI	≥ 0.95	0.98
IFI	≥ 0.95	0.98
TLI	≥ 0.95	0.97
RMSEA	0.05–0.08	0.065

they should concentrate their efforts primarily on social identification which, if increased, will contribute positively to their brand love. Therefore, including word such as “self” and make it closely connected to the brand in their marketing messages will help enhance social identity.

Second, they should create and build awareness to customers, in order to enhance and create brand image. For

example, creating memorable advertising and engaging the consumer with advertising elements which clearly linked to famous people.

Summing up the results, the study goals were reached and the study provides a model to enhance the brand love and gives several important implications for strategic management in mobile phone field.

Table 4 Result of the structural model

Structural equations	Coefficients (β)	t-values	P	Result
Social identification \rightarrow Brand image	0.25	3.908	***	Supported
Social identification \rightarrow Customer satisfaction	0.29	4.544	***	Supported
Social identification \rightarrow Brand love	0.28	4.718	***	Supported
Brand image \rightarrow Customer satisfaction	0.23	3.611	***	Supported
Brand image \rightarrow Brand love	0.24	4.061	***	Supported
Customer satisfaction \rightarrow Brand love	0.26	4.300	***	Supported

***p < 0.001

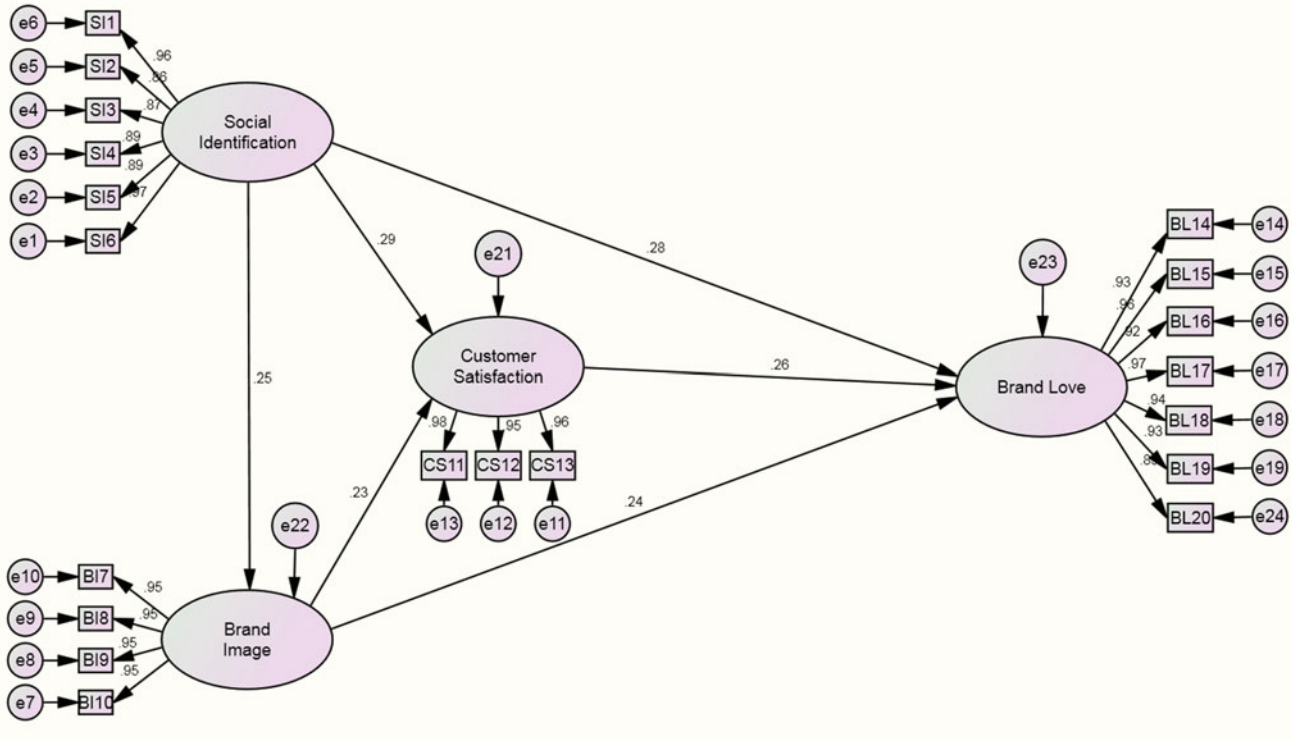


Fig. 3 Structural equation model

5 Research Limitation and Future Research

There are several limitations to this study. First, future research should more analyze the effect of this model on some brand outcomes, such as brand performance, brand loyalty, WOM, e-WOM and brand engagement. Second, Future research could examine the proposed relationships and use moderators such as gender or age. Third, the subject of this study was general customers. It is suggested that future research can focus in more specific social categories (i.e. age, education status, citizenship status and others). Comparison can also be done between them. Fourth, we should try to replacing this study with more brand

categories. Finally, researchers have to show interest in studying negative customer behavior towards brands such as “Brand hate” and “Brand divorce”.

Appendix

Variable Items:

- Brand Love:
 - This is a wonderful brand
 - This brand is totally awesome
 - This brand makes me feel good
 - This brand makes me very happy

(continued)

- I love this brand
- This brand is a pure delight
- I'm very attached to this brand

2. Social Identification:

- When someone criticizes this brand, it feels like a personal insult
- I am very interested in what others think about this brand
- When I talk about this brand, I usually say we rather than they
- This brand's successes are my successes
- When someone praises this brand, It feels like a personal compliment
- If a story in the media criticized this brand, I would feel embarrassed

3. Customer Satisfaction:

- Overall, I am satisfied with this brand
- This brand meets my expectations
- I think I did the right thing when I bought this brand

4. Brand Image:

- This brand is a brand leader
- Using this brand is a social status symbol
- This brand has a good reputation
- This brand is recommended by famous people with whom you identify

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State Responsibility in Combating Dangerous Climate Change: The Critical Role of Domestic and International Justice

Mahir Al Banna

Abstract

This study discusses the role that States should play to limit dangerous effects of climate change which leads to human rights violations as it's a problem that crosses the borders and it's already a reality that many countries and islands are threatened to disappear. The State bears the responsibility to protect human rights, a responsibility that lies on international organizations as well. In part one, we discuss the insufficient measures taken by States at the international level, as many factors constitute obstacles: (1) The lack of internationally recognized human right to the environment linked to the absence of a legal status for climate refugees make the responsibility approach untenable. (2) The difficulty to establish legal responsibility based on a causal contribution to harm makes the responsibility approach insupportable. In fact, the 2001 International Law Commission draft articles on state responsibility for internationally wrongful acts are not binding. But the great difficulty concerns the distribution of the repair burden between States responsible for the emission of greenhouse gases. It is extremely difficult, if not impossible, to measure the share of each State in climate change. (3) The limits of United Nations Framework Convention on Climate Change of which the great bargain is to avert catastrophic climate change consequences by reducing the average global temperature increase to about 2* above pre-industrial levels. Part two, suggests solutions through an advisory opinion from the International Court of Justice, and analyzes the successful regulation of climate change effects by domestic courts, by focusing on the Urgenda case in Netherlands.

Keywords

Climate change • International Law • United Nations • International Court of Justice • Domestic Courts • UNFCCC • State responsibility • No harm rule • Human rights • Environment • Greenhouse gas emission • Separation of powers

1 Introduction

The speed at which the nature of the atmosphere has changed over the last two centuries draws one's attention. Scientists use the term greenhouse effect. The Swedish Sventi Arnios [1] was the first to use it in 1896 to indicate the results of the increase in carbon dioxide in the atmosphere resulting from the combustion of fuels. The Kyoto Protocol (1997) named six gases responsible for the greenhouse effect: Carbon dioxide (CO₂), Methane (CH₄), Nitrous oxide (N₂O), Chlorofluorocarbons (HFCs), Perfluorocarbons (PFCs) and Sulfur hexafluoride (SF₆) [2] and showed that the quantities of these gases depend on the quantities emitted by the combustion of fossil fuels (petroleum, coal, liquid gases) and other forms Energy, as well as industrial, agricultural and waste management activities. However, how does the greenhouse effect develop? [1].

The greenhouse effect is a natural phenomenon that allows the planet to maintain an average temperature of 15 °C thanks to the natural gas layer of the low atmosphere that covers the earth like a greenhouse glass, preventing much of the radiation solar energy to be returned to space. But since the beginning of the industrial era in the 18th century, an artificial surplus of greenhouse gases (GHGs) resulting from human activities retains more radiation. It is this increase in the greenhouse effect that is mainly responsible for global warming.

The latest annual report on the state of the climate draws a very bleak picture after two consecutive years where the

M. A. Banna (✉)
American University in the Emirates, Dubai, UAE
e-mail: mahir.albanna@ae.ae

overall temperature was at its highest since the beginning of the temperature readings in 1880.

According to the report of the National Oceanic and Atmospheric Administration (NOAA) the first six months of 2017 are among the hottest recorded since 1880. The publication of this report takes place one week after the withdrawal of United States from the Paris climate agreement concluded in 2015 by 195 countries. President Donald Trump declared this agreement “*bad for the US economy*” [2].

Reports from the International Panel on Climate Change (IPCC) outlined various impacts of greenhouse (GHG) emissions into the atmosphere. These consequences include health and environmental damages, loss of land and property, threats to State security and human casualties.

In 2005, for example, the Inuit Circumpolar Council filed a case before the Inter-American Commission on Human Rights, based in Washington DC, claiming that global warming caused by greenhouse gas (GHG) emissions in the United States violated the right of Inuit peoples to maintain their traditional way of life due to the destruction of the Arctic environment. But the commission rejected the complaint for lack of sufficient evidence.

International law has proved that it’s not well equipped to deal with the complexity of climate change consequences as it lacks a real system of enforcement of its rules. This is will be the subject of Part one of this study.

As the most important subject of international law, can the State be held responsible under international law for climate change damages? Has it a legal obligation to protect its citizens from climate change impacts? Is there an obligation under international law to prevent and to compensate such damages?

In different regions of the world, victims of global warming have tried to take legal actions against States political leaders, but this did not give anything until the Urgenda trial which we will discuss in our second part of this study.

2 Responsibility of Countering Climate Change in International Law

At the international levels, States gathered efforts to find solutions for climate change impact by concluding multi-lateral treaties. Many obstacles make the mission of international law a difficult one. Among them, one can note the difficulty to establish a legal responsibility on States accused to emit greenhouse gases, the non-binding force of international agreement, but above all these issues, the lack of international human right to the environment.

2.1 The Lack of Internationally Recognized Human Right to the Environment

The contribution of international law in the environmental field is insufficient. The shortcomings of international environmental law in this area are evident in the absence of an internationally-recognized human right to the environment and the absence of international environmental organization as well. Of course, the United Nations has, in addition to FAO and the Commission on Sustainable Development, the United Nations Environment Program, a program that does not have enough resources.

The United Nations Framework Convention on Climate Change (UNFCCC) is an international environmental treaty adopted on May 9, 1992 and opened for signature at the Earth Summit in Rio de Janeiro from 3 to 14 June 1992. Principle 10 (*Information/participation/justice*) of the UNFCCC seeks to ensure that every person has access to information, can participate in the decision-making process and has access to justice in environmental matters with the aim of safeguarding the right to a healthy and sustainable environment for present and future generations.

It sounded like an emergence of a basic human right to a proper climate. In fact, according to the UNFCCC, all States parties undertook to respect and promote human rights. On this basis, States should implement the necessary measures to reduce the GHG emissions, so that the climate balance is not broken; as well as to adapt the new eco-climatic conditions, so that the prejudices caused to human rights are limited as possible and, in any case, bearable.

The category of human rights that are threatened and affected in this way includes but is not limited to: the right to life, health, water, food, and other social, economic and cultural rights of the children, women, minorities and indigene populations. Meeting the requirements of such obligations implies that the States especially:

- Adopt and implement actions at the international, national and local levels, in order to adapt to the unavoidable effects of the climate changes and minimize their effects on the exercise of the human rights.
- Guarantee the public access to the information about climate changes as well as the revealed policies, projects and practices, by assigning the appropriate institutions to coordinate and implement the efforts to reduce the GHG emissions and diminish the extent of climate change [3].

The vulnerable States Islands such as Palaos, Tuvalu, Fidji, Kiribati are among the real victims of increase of GHG as impact of climate change threatening their nationals that flee their destroyed countries to seek refuge elsewhere.

International law, as well as its branches, lacks specific protection for climate refugees. While international humanitarian law applies only to “*victims of armed conflicts and does not apply to victims of environmental disasters*” [4], the Geneva Convention relating to the status of refugees of 1951 is often inapplicable at this ensures the protection of persons fleeing because their States no longer protect them or because they are persecuted by those same States.

So, in this area, international law is facing a legal vacuum (*vide juridique*) and a lack of legal status of these persons in international conventions and treaties [5]. At the time of the adoption of the UNFCCC in 1992, the emphasis was on mitigation and the adverse effects of global warming. Neither the Convention nor its Kyoto Protocol adopted in 1997 to strengthen the obligations of global emissions of greenhouse gases has addressed climate-related human mobility [6].

Although no specialized international legal instrument exists to guarantee assistance, an important contribution to fill this legal vacuum comes from unprecedented African legal instruments. Indeed, the Organization of African Unity (now called African Union) Convention governing the specific aspects of refugee problems in Africa and its application to transboundary climate displacements is an Africanization of the Geneva Convention [7]. In fact, the peculiarity of the African continent, as well as its traditions of hospitality, are reflected in relevant and new regional instruments in the protection of climate displaced people [7]. It is also important to mention the other regional legal instrument, the African Union Convention (Kampala Convention on internally displaced persons of 23 October 2009), which is the most successful example of such regional protection. This instrument has a remarkable peculiarity: it is a legally binding instrument, contrary to regional and international agreements in this field. The Kampala Convention defines the climate displaced people as follows:

For the purpose of the present Convention: “*Internally displaced persons*” means ‘*persons or groups of persons who have been forced or obliged to flee or to leave their homes or place of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situation of generalized violence, violations of human rights or natural or human-made disasters; and who have not crossed an internationally border*’ [8].

In fact, the important contribution of this Convention is the explicit reference made to the climate refugees. According to paragraph 4 of Article 5: “*States Parties shall take measures to protect and assist persons who have been internally displaced due to natural or human made disaster, including climate change*”.

For one author [9], Beyond the absence of an internationally-recognized human right to the environment,

there exist several challenges in proposing a rights-based response to climate change enumerated in article 1 paragraph k. (1) *whether a rights-based approach should be remedial or preventative*; (2) *whether large emitters should be treated as having violated human rights*; and, (3) *whether human rights can propose a system for distributing responsibility for funding climate change adaptation* [9].

In 2005, the Arctic Inuit (used to be called Eskimos) petitioned the Inter-American Commission on Human Rights to recognize that the rights to the benefits of their culture guaranteed by Article 13 of the American Declaration of the Rights and Duties of Man, was not respected by the United States whose emission of greenhouse gases are responsible for the degradation of their Arctic environment. In fact, emissions from rich countries violate the rights of millions of the poorest people in the world. 23 countries, including the United States, Western Europe, Canada, Australia and Japan, account for only 14% of the world’s population but have produced 60% of carbon emissions since 1850 and continue to produce 40% of current emissions. In 1992, these countries promised to reduce their annual emissions to 1990 levels by the year 2000. On the contrary, they have increased their collective emissions by more than 10% above 1990 as of the year 2005—some increase exceeds 155 in Canada, Greece, Ireland, New Zealand, Poland, Spain and the United States. Their collective failure to take action has increased the scientific and political risk of global warming, exceeding the critical threshold of 2 °C. The Inter-American Commission rejected their request for lack of sufficient evidence. Indeed, it is almost impossible to legally establish the responsibility of states that emit greenhouse gases in violation of human rights, since international law does not criminalize this type of offense. That is why the Inter-American Commission on Human Rights responded to the petition of the Inuit: “*The information submitted did not enable us to determine whether the allegations could be characterized as a violation of the rights protected by the American Declaration.*”

Since the petition was directed solely against the United States and not the other UNFCCC signatories and its Kyoto Protocol, and which emit a considerable amount of greenhouse gases, the Inuit are forced to prove how only one country could be held responsible for actions committed by many States. This petition not only undermines the responsibility of the United States for human rights violations, but also blames the United States as the main emitter of carbon dioxide, in accordance with the principle of common the UNFCCC.

These legal subtleties are unacceptable to the Inuit of North America, who may lose their homeland and culture. Can they be told that their rights have not been violated because it is difficult to attribute responsibility? If so, it is

surely because international law is in default and not our sense of equity and justice? Are there rules of responsibility at the international level?

2.2 The Difficulty to Establish International Legal Responsibility

Per customary international law, States should do each other no harm. If a State exercises an activity which damages another State, it violates this rule if this is done on aim or due to carelessness. That means impacts of climate change fall under this rule, which is reinforced in many international conventions, protocols and declarations.

In a context where the consequent disturbances and damage to climate change are becoming increasingly important, while climate negotiations seem more than ever in a stalemate, there is an urgent need to turn to the rules of international responsibility and Whether States could be held responsible for failing to take timely and effective measures to reduce greenhouse gas emissions and/or for passively participating in the achievement of such damage.

A positive response would put pressure on the main contributors of greenhouse gases. The commitment of their international responsibility could indeed be accompanied by an obligation to repair damages whose amount could reach highs.

The draft articles of the International Law Commission on the Responsibility of States for Internationally Wrongful Acts are established by International Law Commission in 2001. Although many States argue that these articles are not binding as customary law, their implications are not to be underestimated. As the Chairman of the Drafting Committee had noted, the adoption of these articles marks a historic occasion as the ILC has been working on the law of responsibility for over 60 years.

The State responsibility is engaged when it commits an internationally wrongful act [9]. Article 2 enumerates the conditions and elements of an internationally wrongful act of a State: There is an internationally wrongful act of a State when conduct consisting of an action or omission:

- (a) is attributable to the State under international law; and
- (b) Constitutes a breach of an international obligation of the State.

First, there should be a violation of an international obligation, in customary law, especially in the principle of prevention. In the case of April 20, 2010, Pulp Paper Factories before the ICJ: “The principle of prevention as a customary rule originates in the due diligence required of the State in its territory.” The conditions are:

1. The damage must be foreseeable
2. The damage is transboundary
3. The damage is serious or serious.

Regarding the effects of State responsibility for consequential damage to climate change, there are two effects: the first is the cessation of the wrongful act if this constitutes a continuing violation. The second is the obligation to repair the damages: the repair must be integral, cover the entirety of the damages suffered, which includes bodily injury, damage to property and economic losses. Repairing damage to the environment itself?

The repair must certainly cover all the expenses incurred to contain the damage to the environment or to rehabilitate damaged areas. Should the repair also cover pure ecological damage, e.g. damage to biodiversity? Damage to such environmental values (biodiversity, amenities, etc., sometimes referred to as ‘non-use values’) is no less compensable in principle than damage to property, even if it is more difficult to assess. In addition, damage to the environment is infringed on an interest protected by the State. For example, in the judgment of the Paris Court of Appeal of March 30, 2010 in the affair Erika, the French State, “in its capacity as defender of the interests of the nation”, but also the territorial collectivities whose Beaches and coastlines have been sullied by the black tide, must be compensated for ecological harm as a defender of the welfare of the population.

But there are two final difficulties:

1. Proof of causality between the breach of international law and the damage for which reparation is sought. For damage caused by climate change, proof of such a link can be very difficult to produce. To find a solution, we can turn towards the European Court of Human Rights, 27 January 2009, in the case of Tatar v. Romania: in the case of scientific uncertainty, proof of the causal link may be provided by the production of sufficient and convincing statistical data.
2. The distribution of the burden of reparation between responsible States: as regards damage caused by warming, which is damage caused by the accumulation of many actions over a long period of time, it is extremely delicate, if not impossible, to measure the share of each state in climate change. Is the solution to the responsibility *in solidum* (which means ‘collective responsibility’) [9] of all States that have violated international law and contributed to the damage?

In the climate regime resulting from the UNFCCC and the Kyoto protocol, distributive, corrective, reparative justices are articulated which gives a first foundation to climate justice. As per the first principle, Article 3.1 of the UNFCCC

provides: “*The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities*”.

The principle of *common but differentiated responsibilities* means that there is a differentiation between obligations on developed countries and other countries not subject to obligations to reduce their emissions of greenhouse gases. Under this principle, it is considered that if all States are obliged to preserve the environment, their obligations vary according to the level and needs of their development.

Another principle set by the UNFCCC is the ‘*Polluters Pay principle*’ is a commonly accepted practice which means that those who produce pollution should bear costs of managing it to prevent damage to human health or the environment, as GHG are considered a form of pollution because they cause potential harm and damage through impact on the climate.

How can State assure to protect their citizens from dangers of climate change especially in the lack of enforcement system in the international law in addition to the non-legally binding character of its decisions?

2.3 The Non-legally Binding Force of the UNFCCC

At the terminology level, one should distinguish ‘legal’, ‘legally binding’, and ‘mandatory or enforceable’. As all legal instruments do not create obligations, for example a UN General Assembly resolution is a legal act that does not create obligation [10]. The instrument or norm “legally binding” creates an obligation, that’s to say a legal link by which a subject of international law is bound towards one or more others, to adopt a particular behavior or to abstain from it.

“Mandatory and/or enforceable” means a provision or instrument that maybe the subject of an act or threat of coercion. A measure maybe legally binding but not enforceable (in the absence of means of coercion), which is often the case in international law. A measure may be enforceable without being legally binding because it imposes itself on the State (like certain sanctions decided by the committee implementing the Kyoto protocol). In this sense, a legally binding provision may not be enforceable because it is too vague, blurred or imprecise in its formulation.

A mechanism for monitoring the execution by States can be established for a compulsory instrument (treaty) or not (resolution of an international organization) From the point of view of international law, the Paris agreement is not strictly binding, insofar as it does not provide for coercive mechanisms or penalties for countries that fail to honor their commitments. There is nothing binding: there is no sanction, so States do what they want.

In fact, the 29 Articles of the Agreement do not establish a “Compliance Committee”, nor a sanctioning mechanism, as provided for in the Kyoto Protocol, the previous climate agreement adopted in 1997 and entered into force 2005 with no legal consequences. The Paris Agreement also contains numerous legal obligations of results, referred to in the text as “shall”, or “should”. Their range and strength are played out in nuances. The UNFCCC itself had no binding legal force. It does not set mandatory limits on the emission of greenhouse gases and has no enforcement mechanisms. Throughout the history of the United Nations regime on climate change, debates on the legal character (the central issue) have been a recurring theme. In the negotiation of the UNFCCC, perhaps the most complicated issue to be resolved was the legal character of emissions targets for developed countries.

For Daniel Bodansky [11] the question of legal nature, so important, is only one factor in the evaluation of COP21. In fact, transparency, accountability and precision can make a significant difference, and the issue of the obligation to implement agreements can also be a double-edged sword if it pushes States not to participate less ambitious commitments. Other scholars such as Anne-Marie Slaughter, the former president of the American Society of International Law, denounce the non-binding nature of COP21: “Treaties must contain “enforceable rules” with “sanctions” for non-compliance and must be ratified by domestic parliaments so that they become a part of domestic law”. Because the Paris Agreement is “none of these things”, she concludes: “it is essentially a statement of good intentions rather than law” [12].

The provisions of COP21 on mitigation are formulated as recommendations or expectations rather than legal obligations, as outlined in Article 4 (1): the agreement establishes a common objective to achieve a global peak in emissions as soon as possible and to proceed with rapid reductions thereafter, to achieve zero net emissions in the second half of this century.

By analyzing the Paris agreements, it is found that the means are not commensurate with the environmental ambition displayed. Indeed, the report of the UNFCCC published before COP21 estimates that the commitments of the developed countries lead us to a scenario of increase of 2.7–3.5 °C by the end of the century. Moreover, no specific measure targets air and maritime transport, the emissions of which are, however, increasing very worryingly [13]. As some authors note:

The Paris agreement might lead countries to offer only modest improvements in their future climate plans. That will not be enough. Even if they fulfill their existing pledges, the earth will likely warm by some 2.7 to 3.5 degrees Celsius – risking planetary catastrophe. And cutting emissions much more is a political nonstarter, especially in developing countries such as

India, where policymakers must choose between powering economic growth and phasing out dirty fossil fuels. As long as this tradeoff persists, diplomats will come to climate conferences with their hands tied [14].

All this confirms the limits of international law. Indeed, this international legal framework does not have the necessary tools to supervise hazardous industrial activities and protect the ecosystem. Can international justice arbitrate this international responsibility? Currently, the legitimacy of the UNFCCC is affected by its lack of progress in mitigating climate change. When only negotiations are incapable of mitigating the adverse effects of climate change, the rule of law is the only way to establish a clear standard for all States. The rule of law is thus fundamental to promoting political dialogue and cooperation, and the International Court of Justice (ICJ) is the appropriate judicial body to advice on issues related to the rule of law.

2.4 The Possibility of an Advisory Opinion by the International Court of Justice

The International Court of Justice (ICJ) is the United Nations' judicial organ. It has a dual role: it settles legal disputes between states and gives advisory opinion to the UN organs. States cannot ask the ICJ directly for an advisory opinion but can pass by the UN General Assembly. The objective of an advisory opinion in this area is the aim of benefiting the international community by looking forward. Nature is the extent of duty or obligation to prevent climate change under international law and to deal with the future consequences of global warming.

An advisory opinion of the ICJ on climate change, and of historical value, would have the power to reshape the international approach to greenhouse gas emissions positively. This advisory opinion would make it possible to highlight climate change as a real crisis and then define the obligations and responsibilities of States about emissions under international law. Counseling by the ICJ could help to develop new international standards of conduct governing transboundary harm caused by emissions and could provide the necessary clarity on the principles under which States can negotiate effective solutions. It is therefore the appropriate time to seek advice from the ICJ on the rights and obligations of all States with regard to climate change [15]. Such an advisory opinion on the prevention of future effects, as well as on the mitigation of such effects, particularly the burden of sharing responsibility, could fill the rhetorical vacuum and help bring action by the State in accordance with international legal responsibilities.

The question that could be asked of the ICJ when requesting an advisory opinion on the matter was: "*What are the obligations under the international law of a State to*

ensure that the activities of its jurisdiction or control which emits greenhouse gases, do not cause or contribute substantially to serious damage to another State or to other States?" It is important to refer to the most relevant advisory opinion with climate change, the legality of threat or use of nuclear weapons in 1996, in which the Court affirm that:

The Court recognizes that the environment is under daily threat and that the use of nuclear weapons could constitute a catastrophe for the environment. The Court also recognizes that the environment is not an abstraction but represents the living space, the quality of life and the very health of human beings, including generations unborn. The existence of the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now part of the corpus of international law relating to the environment [16].

With the decision of the Court, it was more possible to argue that the protection of the environment is not governed by the rules of public international law. Since an advisory opinion is not mandatory, the ICJ cannot, for example, compel a State to limit any specific amount of emissions through an advisory opinion. It may, however, provide an authoritative decision on the principles of general international law. In so doing, the ICJ, through its consultative function, helps to establish international standards of behavior for the State.

Although this has not been the unequivocal determination that some had hoped, the observations and reasoning of the ICJ remain undeniably valuable. On the issue of transboundary environmental damage, the ICJ established the principle that all States should ensure that activities within their jurisdiction and control of the environment of other States or areas beyond national control. As to their legal effects, the contribution of advisory opinions to the development of international law has never been contested, since they constitute at least one "subsidiary source of law" in accordance with Article 38 of the ICJ Statute which states: "The Court, whose function is to decide in accordance with international law such disputes as are submitted to it, shall apply:

- (a) international conventions, whether general or particular, establishing rules expressly recognized by the contesting states;
- (b) international custom, as evidence of a general practice accepted as law;
- (c) the general principles of law recognized by civilized nations."

To render justice to island States affected by the severe effects of climate change, would it be necessary for an advisory opinion to have an impact in the law-making process? That the international community agrees on legal instruments to render justice to these states and to climate

refugees? As Monfred Mohr [17] asserted regarding the ICJ's opinion on the threat or use of nuclear weapons:

Despite some flaws and contradictions, the Court advisory opinion of 28 July 1996 represents a triumph for the rule of law in international relations. The Court had taken a stand on one of the most burning legal and political questions of our time, and its response is in essence a negative one. Even though such advisory opinions are not binding, they nonetheless carry very high authority. The impressive structure of this opinion places it among the ranks of earlier "famous" opinions handed down by the Court, which have substantially influenced the development of international law.

This being the case, today, the advisory opinions which are taking steps, perhaps progressive in the definition of the rule of law, constitute only declarations, serve as precedents, guidelines or declarations making considerable authority, but no more. They do not make legislation, for it is the States which still fulfill the role of the legislator in international law.

For Sir Robert Jennings: "Advisory opinions are requested in order to hear the opinion of the Court on the current law of law, and when the Court finds a lacuna it is not its task to fill the void, has only the function of saying the law in force at the moment in time".

At the international level, *"the role of the judge does not consist in replacing the legislator; he must limit himself to establishing the rule of law without being able to substitute his appreciation for the will of the sovereign States"* [18]. But for an author: *"Unofficially, the role of the international judge is much broader, and by interpreting, updating, completing or making it operational, it necessarily involves the creation of the law. In interpreting the rule of law, the judge, in fact, chooses one of the possible meanings, and thus sets the norm and not the author of the rule interpreted."* [19].

Climate change is by nature a problem that transcends borders, hence the need to create an international tribunal for climate justice. But the question of the competence and sanctioning power of this tribunal still arises. Which States will accept to be judged? In case of failure of international justice, can internal justice provide a solution? In a pragmatic way, it appears that the competence and powers of the domestic judge provide a real solution because, by forcing local governments to take measures to combat global warming, these internal judges' decisions that have consequences at the international level [20]. This is what we will see in the next chapter when we discuss the Urgenda case in the Netherlands.

3 Responsibility of Countering Climate Change in Domestic Law

In Netherlands, the judges have just ordered the government to shake up its energy policy. This encourages many judges who dream of burying the principle of separation of power.

If it is recognized that it is the responsibility of States to fight against the sources of global warming, they could not believe that one day their responsibility could be engaged for this fact. The Court's decision in the Urgenda case retains the responsibility of the Dutch state because of its inaction in the face of climate change, which is described as a violation of human rights.

3.1 The Urgenda Case

In the Urgenda case, Urgenda Foundation v. the Netherlands, The Hague Court on 24 June 2015 ordered the State to limit its GHG emissions by 25% by 2020 compared to 1990: "Its currently very likely within several decades dangerous climate the state must do more to counter the imminent danger caused by climate change, given its duty to protect the environment." The Court also ordered the State to pay all the legal costs of the Urgenda Foundation, active in the fight against climate change. To this end, the Court made a judgment based on the need to limit the rise in global temperatures below 2 °C above preindustrial levels. It should be noted that the Netherlands is vulnerable to the impacts of climate change, as two thirds of its territory is below sea level, threatened by rising water levels.

According to Esmeralda Colombo, in the Urgenda case, with respect to the substantive issue of State liability, the Court did not directly apply either international law or European law. Rather, the non-domestic sources of law were deemed to have a reflex effect in national law by substantially supplementing it, which might be characterized as the indirect application of international law [21].

In this case, the judges relied on Book 6, Section 162 of the Dutch Civil Code, providing for redress to an open-catalogue type of tort—a tort not rising from defined circumstances but rather when damages materialize. The provisions of the Dutch Civil Code, however, only provided the legal theory of unlawful hazardous negligence, so the Court had to turn toward constitutional law international law and European law, in order to flesh out the standard of care required and allegedly not met. So, the Court first questioned the degree of discretionary power the State is entitled to in climate change policy. Secondly, it deployed a bundle of European and international law tools to hammer out the minimum degree of care the State is expected to observe in the matter [21].

In fact, Article 21 of the Dutch Constitution "imposes a duty of care on the State relating to the livability of the country and the protection and improvement of the living environment" [22]. The Court interpreted the relevant provisions in the Constitution in the light of 3 sets of sources: the no harm principle, international law, and EU law. The Netherlands did not protest against the no harm principle

which set that no State has the right to use its territory, or have it used, to cause significant damage to other States, [23] which the Netherlands would do unless it reduces emissions and notwithstanding its small contribution to the worldwide amount of GHGs.

The Court relied on the “elevated risk of hazardous climate change” and therefore found out that such a duty of care bound the Dutch government to prevent such a high risk from coming about. The omissions to take action on such a risk were evaluated against the international obligations the Netherlands undertook in becoming a signatory to the UNFCCC and the Kyoto Protocol [22]. In the Urgenda case, the State recognized that there was a climate problem, however, it does assume the responsibility for it, and instead it blamed others. The State argues: that ‘*it cannot be one of the causers of an imminent climate change because it doesn’t emit greenhouse gases*’ [23].

The Dutch, whose country is well below sea level, have reason to worry about climate change. But they live in a country that has the resources to adapt. Poor countries, which have contributed less to climate change and are often less well prepared to respond, are likely to suffer the most. It is for them that the Dutch victory is crucial. The decision will encourage others to refer to human rights in relation to the dangers of climate change. So, the question to be raised is, does the decision of the Dutch court mark a turning point in the entire world?

3.2 The Principle of Separation of Powers Endangered?

In 2008, the village of Kivalina, Alaska, filed a lawsuit against several large companies in the energy sector, arguing that global warming had led to the reduction of ice formation at sea, which had forced the village to be displaced. The case has been dismissed as a result of the judicial settlement, that decisions on tolerated levels of greenhouse gas emissions are to be made by the executive and legislative powers, not the courts. The principle of separation of power is well respected.

Contrary to what had happened in the United States, In Netherlands, the government contested the Urgenda judgment claiming that it violates the principle of separation of powers (*trias politica*) established by the French philosopher Montesquieu, according to which the powers within a State are divided in legislative, executive, and judicial powers and which is seen as being one of the most fundamental pillars that democracy rests upon. Forcing a democratically elected government to do more about climate change through the court is a violation of the *trias politica* [24]. Can the Judiciary get involved in the tremendously complicated area of

science-based government policy making? [25]. The court room is the right place to debate climate policies set by the State?

A professor of international environmental liability law describes the Urgenda case as a victory for climate change but is likely to backfire. He argues:

Thus, while this court judgment is celebrated as a victory for the climate, it is also a threat to the rule of law and constitutional democracy. At the request of all sorts of action groups, civil courts could make policies with respect to any risk, from immigration to genetically modified food, and from chemicals to health care. This could lead to policies that are supported only by small minorities and involve high costs of compliance; consequently, it might well spark a political backlash [25].

For this author, as for the separation of power, it is highly questionable that the judiciary would get involved in the tremendously complicated area of science-based government policy-making. It’s doubtful whether such judgments are legitimate, and the rulings will be sound. A courtroom is not the right place to debate climate science and the public interest in more protective policies [25]. “*Thus, while this court judgment is celebrated as a victory for the climate, it’s also a threat to the rule of law and constitutional democracy*” [25].

The Court replied to the accusation of violation of the separation of powers by pointing at the fact that a very strict separation between the judiciary and the executive powers does not exist in the Netherlands [24]. But even if we admit that the court had violated the *trias politica*, does this justify that the State violate the Dutch law, human rights law and international law? Is the government immune to the rule of law to the rule of law, regardless of whether it is democratically elected?

In fact, the legal basis for State liability here is questionable. As every country has its own independent obligation to cut emissions, the fact that “*the amount of the Dutch emissions is insignificant compared to other countries does not affect the obligation to take precautionary measures in view of the State’s obligation to exercise care*”. And “*it has been established that any anthropogenic greenhouse gas emission, no matter how minor, contributes to an increase of CO₂ levels in the atmosphere and therefore to hazardous climate change.*” The reasoning of the court confuses duty and causality, in addition, it’s scientifically doubtful, because there is no proof that minor increases in CO₂ levels contribute to hazardous climate change. Nevertheless, the State is found liable.

The real problem is who holds that power? Who decides the development of climate policies? To put it simply, all the judges answered, not me. Before the Urgenda trial, no court had really endorsed that role. Indeed, the Netherlands intends to appeal the Urgenda judgment because it considers that principle of separation of the power is at stake.

The accountability of States has resulted in the emergence of climate responsibility desired by environmentalists. State liability may thus be engaged whenever and wherever they have not done enough to achieve reduction of global warming [26].

The state has an obligation of vigilance, a duty to protect in respect of climate to enforce. The other obstacle is the risk of encroachment by the judge on the executive power, but the judge replies that in a State governed by the rule of law, the judge is legitimate to render a decision which obliges the State to respect its obligations [26].

The notion of climate responsibility according to Laurent Neyret is embodied in the scientific demonstration of the existence of a causal link between human activities and the worsening of global warming itself causing widespread damage to health, property security and biodiversity. From this point of view, law will take over the ethics of responsibility as stated by the German philosopher Hans Jonas, for whom the extension of the powers of man must be extended by an extension of his responsibilities [26].

Several legal principles are convened to serve the concept of climate responsibility. On the one hand, it is the *polluter pays* principle, which places an obligation on the perpetrators of pollution to pay, whether in the form of taxes or damages. On the other hand, the principle of prevention means that it is better to prevent than to cure, especially when the essential stakes such as the health of humanity or the security of the environment are concerned.

3.3 Obstacles to the Recognition of Climate Responsibility

It is very difficult to prove the direct and certain causal link between greenhouse gas emissions and any damage such as the death or destruction of buildings as a result of a hurricane. Indeed, the difficulty arises mainly from the fact that human causality is often confused with a natural causality of harmful events, such as extreme climatic events. Beyond that, if the link is too distant, the right cannot be applied because of the risks of injustice that this entails. Consequently, uncertainty about causality contributes to mitigating responsibilities.

The other complicated issue is how to identify responsible persons. Of course, the industrial or human activities that cause greenhouse gas emissions are known, such as the petroleum industry, the chemical industry, the building industry, or transport. But who should be sued in the production-distribution chain? For example, in the field of transport, who would be responsible among the various stakeholders? Car manufacturers? Oil companies? Highway companies or the owners of vehicles? Isn't there a risk of declaring everyone responsible and then paralyzing the

economy and individual activities? There is also a risk of falling into the deep pocket effect of recognizing the responsibility of economic operators with the greatest financial means.

Faced with the impediment of the accountability of risks linked to global warming, the complainants go to the State to look for their responsibility. In this respect, it is interesting to cite the French Council of State's decision of June 10th, 2015, concerning not global warming, but air pollution in Paris. This decision is linked to climate justice because it is based on a text of the Environmental Code in Article L. 220-1 of the Environmental Code., which enshrines the right to air quality [19].

More precisely, prevention of health and environmental damage caused by pollution, as well as the effects of greenhouse gas emissions, must be prevented. In this case, *Les Amis de la Terre*, a French NGO, had filed a case against the prefect of the Ile-de-France region, the prefect of Paris, and the police prefect to impose on them to take all necessary measures to reduce particle pollution in Paris. Before all the courts seized, on appeal and until cassation before the Council of State, the association did not win. Indeed, the judges considered that despite the obligation for public bodies to adopt specific plans for the protection of the atmosphere to comply with the regulatory thresholds, no obligation of result existed against them, only an obligation of means imposed on them.

This argument could also be solicited in terms of global warming, to mean that it imposes on the State a simple obligation to take measures and not an obligation of result in reducing greenhouse gas emissions. The difficulty of blaming the damage caused by global warming to this or that person is exacerbated by the fact that there may be a very long delay between the time of the emission of greenhouse gases and the moment of the occurrence of the damage. In addition, damage often occurs because of accumulation, and it will be difficult to determine what share of liability a defendant has in the occurrence of the damage. Temporality should therefore mitigate responsibilities.

On the other hand, the distance between GHG and the occurrence of damage can also constitute an obstacle to the recognition of responsibilities, in that it can be measured in thousands of kilometers. In this case, there will be a problem of law enforcement in the space that will arise and a problem of jurisdiction. For example, what will be the capacity of a French judge to engage the civil liability of a Chinese company for its activity in China causing a worsening of global warming and a storm felt in French territory? What is more, in the event of non-compliance with the international commitments of a State in terms of the fight against emissions of greenhouse gases?

Beyond that, the activities causing global warming are most often lawful authorized by the States. If a judge must

acknowledge the civil liability of an industrialist, or if he has an injunction to reduce his emissions of greenhouse gases, as in the Urgenda case, would that not be the case? Not perceived then as an attack on the principle of separation of powers?

Against the State, it would be possible to formulate a claim for compensation for fault. In France, this responsibility has already been recognized in the field of asbestos or water pollution in Bretagne by nitrates. The idea here is to condemn the State because of its inaction to limit the harmful effects of activities whose character is dangerous for health or the environment is known. In this case, the State is condemned to pay damages to the victims. The aim of such action is to put pressure on the State to take regulatory measures to alter risky behaviors.

This basis of liability for faulty deficiencies could also be used in the field of global warming if it had been shown that a State, despite the knowledge of the effects of greenhouse gas emissions, was practicing a policy deemed insufficient. In the past, we have heard the secretary of the World Meteorological Organization, Michel Jarraud, under the aegis of which International Panel on Climate Change (IPCC) is in place, to assert after the dissemination of the last IPCC report that “*in 30 years governments and the decision-makers at all levels will be held accountable for decisions that would not be taken now because “we know we have no more excuses to act”*” [27]. The IPCC is the Intergovernmental Panel on Climate Change. Its reports summarize the published work of thousands of researchers analyzing global trends and forecasts of climate change. It was established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Program (UNEP).

It is important to note that the responsibility of private decision-makers could also be engaged on certain conditions. One of the privileged bases for engaging civil responsibility in relation to global warming should be the preventive responsibility, because in health and environment, it is better to prevent than to cure. In French law, Article 89 of the Code of Civil Procedure allows an action to be taken to prevent the occurrence of imminent damage or to put an end to a wrongly wrongful act. Nevertheless, the conditions of this article are restrictive.

4 Conclusion

The Urgenda case constitutes a milestone in climate change regulation. The verdict and the documents submitted by the petitioners have been informally translated into English with a clear attempt to reach an international audience, which is not a usual practice in the Netherlands. If the Urgenda-type trials multiply in the States, they have no international value

now, they do not constitute precedent. But this could change in the coming years. With time, the proliferation of judgments favorable to climate protection could be used as an indicator, among others, of the emergence of a new rule of international law. For the moment, the International Criminal Court, a judicial body with a link to the United Nations, has always proved its ineffectiveness in applying climate justice. To have their responsibility held when they fail to prevent climate change harm, States should sign conventions subjecting them to international jurisdictions, at the risk of being convicted, but it would sound like they hold the stick to get beaten. A coercive climate regime will have to be established to address some of the weaknesses of international law. In the meantime, this multiplication of judicial actions shows the power of States domestic legal system, which can be condemned by their own internal jurisdiction. As we know, unlike domestic law, the enforcement of norms of international law still represents a major challenge, because it lacks a centralized enforcement system.

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The First Superbrand in Knowledge Economy in the UAE: Morison Menon in a Mission of Building Better Business Globally

Nikola Perovic

Abstract

This case study is focused on Morison Menon, the company primarily active in auditing, accounting and consulting, which has received Superbrand consequently for three years, from 2014 till 2016. The objective of the case study is to explain an impact of Corporate Social Responsibility on the grant of Superbrand recognition. The method of the research is qualitative using semi-structured interviews with the top managers. This company, headquartered in Dubai, has many locations in the UAE: Business Bay and Jebel Ali in Dubai, Abu Dhabi, Sharjah and Ras Al Khaimah. Internationally, the company operates in India, Qatar, Bahrain and Oman. The company is an affiliation of Morison International Group, founded in the UK in 1989. The core competencies of the company are huge knowledge of local market of the UAE, and accumulated expertise of 300 years measured by the experience of its senior managers and partners. The company possesses specialized knowledge in accounting, management consulting, due diligence, different knowledge on industries, such as the health-care industry, IT, etc., and all these specializations differentiate the company compared to its competitors, the top four global players in this industry (PricewaterhouseCoopers, headquartered in the UK; Deloitte Touche Tohmatsu Limited, headquartered in the USA; Ernst & Young, headquartered in the UK; and KPMG, headquartered in the Netherlands). This case study is focused on the company's pathway to "super brands" through committed social responsibility.

Keywords

Brand • Social responsibility • Knowledge economy

N. Perovic (✉)
Higher Colleges of Technology, Dubai Women's College, Dubai,
UAE
e-mail: nperovic@hct.ac.ae

1 Introduction

Morison Menon has a tradition of more than 20 years in the UAE market, and this company was growing parallel with the growth of the country. Specialized local knowledge has been very important for the market competition, and besides core competence in accounting, the company has gain great skills in market research, management consulting and other disciplines, which are critical in the industry of knowledge economy. The Superbrand for Morrison Menon was very unique because it was the first of its kind that received such market recognition in this industry. Compared to any other 'super brands' this fact is very interesting, because it has been common that super brands belong to consumer goods, pharmaceuticals or other similar manufacturing companies. The Superbrand that Morison Menon received was even more specific since it hasn't been supported by large advertising campaigns. High recognitions for this company were a result of continuous trust gained by the great work provided for their customers.

The research objective of this paper is to explain an impact of the Corporate Social Responsibility on the grant of Superbrand recognition that the company has received for the period of three years in the row: 2014, 2015, and 2016.

The methodology that has been used is a qualitative research through semi-structured interviews conducted with the top managers of the company. Based on the interviews, which have been conducted in two meetings, conclusions can be derived regarding the importance of Corporate Social Responsibility practice in this company, and its impact on the grants of high recognition-Superbrand in the UAE.

2 Literature Review

From the foundation book in the field of business ethics and the stakeholders theory [1], where it has been explained that each company has its obligation to the external (customers, suppliers, shareholders, creditors, government, and society),

as well as to the internal stakeholders (employees, managers, and owners), through the contemporary understanding of the social responsibility concept which looks at the Corporate Social Responsibility (CSR) as an approach to responsibly managing an organization [2], it can be discussed about the high importance of ethical behavior for the companies regarding their business survival. According to the marketing orientations [3], companies are using one (or more) of the following five marketing concepts (philosophies): production, product, sales, marketing and societal marketing. Companies that heavily use corporate social responsibility practices, like the company analyzed in this paper, can be clearly related to the social marketing orientation. At the same time, corporate sector, according to Mullins and Walker [4] and Gamble et.al [5] can find (one or more) sources of its competitive advantage either in cost leadership, achieved through operation excellence, product/service differentiation, or customer intimacy. The company explained in this case has been simultaneously using CSR as a mode of its professional service differentiation, and partnership, as the highest level of customer loyalty [6] in creation of the value with its clients aiming at the strong focus on customer intimacy, which shall be explained in more details in this paper.

3 Integration of Stakeholders' Interests

The most important factor for the business success of Morison Menon has been the trust of the company stakeholders: trust of the clients, trust in employees, and trust of the governments. Senior management strongly believes that this trust was gained by the great care for the stakeholders. The Superbrand was actually a result of the way how the company has treated its stakeholders all these years. Therefore, it is accumulated trust that brought the Superbrand for three years in a row. The respect and the trust are core values of the company, and sharing with the society and stakeholders are the roots of its business philosophy. Knowing that a brand is a promise, the Superbrand recognition came from the continuous mission of promise fulfillment for all of the company's stakeholders.

Compared to any other of 200 affiliates of the Morison International group, Morison Menon from the UAE has been a locally grown company due to the high knowledge of local market and continuous care for the local society where the company belongs. The company has very proactive approach and reinvests in the society and potential stakeholders much more before they actually become clients. For example, the company on *pro bono basis* has organized many international meetings and events in order to share the UAE market knowledge among many institutions without knowing if they will ever become its clients.

The primary stakeholders have been the governments of the UAE representing all seven emirates. The partnerships have been gained by following the country's national strategy for investment growth. When one of these governments wanted to attract more international investors from specific countries, Morison Menon officials organized visits to these countries and created meetings and special interest sessions for specific industries. That was the way how the company proactively approached to the prime stakeholders, the UAE governments, by following national strategies. The company leveraged from the large network of 200 affiliates of Morison International Group, and offered many benefits coming from synergies in creating value for its stakeholders. For example, if any government of the UAE planned to attract at least 100 investors from a specific country, like the UK, Australia, India, etc., due to the Group's network of 200 affiliates and its great network of tremendous number of business partners, Morison Menon was able to organize such specific meetings for certain industry in a targeted country creating more value and less costs for the UAE governments. So far, Morison Menon by doing this has been helping governments of Dubai, Abu Dhabi, and any other emirates of the UAE.

Simultaneously, by providing detailed information of doing business in the UAE supported with previously published books for doing business in Dubai and Abu Dhabi, the company was able to assist many potential investors who desired to expend their operations in the UAE. Morison Menon has been creating many partnerships with different embassies and foreign trade missions in the UAE by providing free information on the UAE market for the future distribution among their home country potential investors. This proactive approach of smart responsible investments in future partnerships has been another specific feature of Morison Menon.

The Superbrand supports the company's priorities and goals

The Superbrand has influenced the change of perception among company's potential clients because they now don't only consider "The Big Four" global players above mentioned. More and more potential clients have been approaching to Morison Menon since they recall the Superbrand recognition, which has been linked to the company's priorities to offer the best service in knowledge economy industry.

The major goals for the following years have been growth of the business revenue for 30%, diversification by offering new products, such as IPO consulting, and expansion to other GCC markets. On the other hand, major goal in employee development has been increasing with the number of young employees, in order to reach 70% of young colleagues in the future. By this transition to 70% 'juniors' and 30% 'seniors' the company believes to gain the right recipe

of success by great combination of knowledge, coming from those 30%, and energy, passion, social media savvy, coming from other 70% of their employees.

Being social responsible for Morison Menon goes beyond reporting (the company has international ISO 26000 standards on social responsibility), and the key is to practice being socially responsible at daily basis by helping communities to solve their major problems of poverty. At the same time, Morison Menon has been very socially responsible company investing in young people with disabilities by providing them fully employed positions. They also organize and promote social life of their employees in order to increase a work-life balance.

4 Conclusion and Practical Implications of the Case Study

This case study has had practical implications, both on the corporate sector, and for teaching purposes in using it as a teaching case study with selected questions for class discussions. Regarding the corporate sector, the fact that this case represents the first Superbrand for the knowledge economy in the UAE, opposite to “mainstream” Superbrands for consumer goods industry or traditional services, had a practical value for the Morison Menon, and had been used in national and international media for the brand building purposes and image recognition among its current and potential clients. The equation for the company success is to measure their success by growing together with the UAE, and by being the integral part of this country. “Our success is success of all our clients, all stakeholders, so only by helping our clients to grow, we can succeed”, stated by Mr. Sudhir Kumar, Partner, and the Head of Corporate Communications. Very important measure of success has been community involvement, and as long as the company has been

greatly involved in community growth, they believe to be at the right path of success.

There are many opportunities coming from having Superbrand recognition, and the major location in one of the most global cities in the world, Dubai, and its upcoming 2020 Expo. This world exhibition, coming after recovery from the global economic crisis, will influence larger demand for services, such as marketing research, auditing, and due diligence, as the market has becoming more volatile and sensitive for higher level of risk management.

On the other hand, this case study can be used as a teaching case study for the courses in Social Responsibility, Principles of Marketing (area of societal marketing orientation), as well as for the course of Strategic Marketing Management (area of Customer Relationship Management). Since there is a general deficit of MENA cases, our students in the UAE can benefit more from this course in order to apply their knowledge from local experience.

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The Relationship Between EFL Teachers' Attitudes Towards CLT and Perceived Difficulties of Implementing CLT in Language Classes in Omani Context

M. Al Kalbani, J. Solabarrieta, and A. Bin Touq

Abstract

The present study investigated the relationship between EFL teachers' attitudes in Omani context towards Communicative Language Teaching (CLT) and perceived difficulties of implementing CLT in language classes. Twenty four EFL teachers participated in the study. Their attitudes towards CLT and their perceptions of the problems of implementing CLT were assessed by two questionnaires. The results of the descriptive statistics showed that EFL teachers had positive attitudes towards CLT in general and group work in communicative classes in particular. Further, while EFL teachers generally did not find much difficulty in implementing CLT in language classes, they found the difficulties the educational system creates as a major obstacle to use CLT. Moreover, CLT attitudes and perceived difficulties of CLT implementation were not found to be related; however, when subscales of CLT attitudes and perceived difficulties questionnaires were considered, four correlations were found to be statistically significant. Difficulties caused by teachers in communicative classes were found to be inversely and significantly related to (a) attitudes towards group and pair work ($r = -.530$ and $p = .011$) and (b) attitudes towards CLT quality/quantity of error correction ($r = -.455$ and $p = .033$). Further, attitudes towards the role and contribution of learners in the learning process were found to be negatively related to

students' related difficulties and challenges ($r = -.468$ and $p = .021$) and attitudes towards CLT-Quality/quantity of error correction were also found to be negatively related to students' related difficulties and challenges ($r = -.502$ and $p = .013$).

Keywords

Attitudes • Communicative language teaching (CLT) • Difficulties • Problems • Teachers

1 Introduction

1.1 Significance of the Study

Firstly this study aims to examine teachers' communicative language teaching (CLT) cognition as a main concern to this study. There are several investigators who addressed this issue (see [1]). Secondly, it also aims at examining teacher ability to put CLT into classroom practice and the factors that influence their practice.

There is a research gap in this field as a few studies have been carried out to take in-depth look into appropriateness of CLT from practitioners' perspective through an investigation of teachers' beliefs about CLT and actual teaching practice in the Omani tertiary EFL context. In addition to that, (see [2, 3]) stated that "few studies have been undertaken to look into how well CLT is perceived and adopted as a result, there is a research gap has been paid increasing attention by some theorists and practitioners in different countries".

"Given the persistence of the influence of CLT as a methodology, and its continued dominance in the discourse and practice of the profession, it is surely essential that ordinary practitioners possess a clear understanding of its central ideas" [3]. It is important to study teachers' attitudes and there are not many studies that explore the importance of teachers' attitudes towards the communicative teaching approach.

M. Al Kalbani (✉)
Nizwa University, Nizwa, Oman
e-mail: m.alkalbani@unizwa.edu.om

J. Solabarrieta (✉)
Deusto University, Bilbao, Spain
e-mail: josu.solabarrieta@deusto.es

A. B. Touq
UAE University, Al Ain, UAE
e-mail: abintouq@uaeu.ac.ae

1.2 The Omani Context

In the Omani context, “In spite of claims about ELT curricula being geared towards communicative language teaching (CLT) and the integration of advanced and sophisticated educational technology into English language teaching (ELT) (Ministry of Education 1999, 2008), research has shown that the experience of implementing English through education in the new ambitious ELT national plan in 1999 known as the Basic Education System (BES) has been problematic and thus suffered from major shortcomings” (see [4]). Therefore it is essential to conduct more studies exploring teachers’ attitudes towards CLT and perceived difficulties and challenges of implementing CLT. Moreover, some studies in Oman investigated the major problems that teaching English in Oman had, for instance [5] found that “teachers are required to follow the teacher’s guide and teach for exam purposes, as exams are almost entirely based on the mandated syllabus. This not only conflicts with the policy guidelines, but also largely restricts teacher’s epistemic power and contribution to producing communicatively competent students, who can effectively contribute to nationalization and modernization. Exams, as hegemonic practices almost entirely based on memorizing and copying the sacred textbooks’ knowledge, have been largely the sole and dominant tool for gauging students’ attainment in Oman. Achieving high marks in tests in Oman has always been a reflection of the effectiveness, success, and credibility of the system and the individuals administering it.

In addition to that, [6, 12] said that “A majority of public school leavers lack the linguistic and communicative skills required for their future academic or professional success”. Similarly, [4] indicated that the majority entering higher education need an English foundation program which might last up to two years and he also predicted reasons for such a problem. [6, 12] also confirmed that “One is the curriculum, which does not do well in equipping students with communicative competence or performance. It is a top-down, centralized process, seeking to ensure that all students graduate with a range of information or knowledge deemed important by decision makers. Furthermore, teaching methodology remains firmly teacher-centered, despite repeated calls for communicative language teaching” [7]. Those studies showed that curriculum and using traditional teacher centered teaching methodology could be one of the reasons for students’ low English proficiency. These factors, coupled with an environment that uses English as a foreign language only, play a major role in producing students’ low proficiency in the language and a lack of communicative ability.

However, “while previous research has speculated on such reasons, it has never addressed the issue directly”. Therefore as it had been suggested that it is necessary to “to tackle the

issue directly, giving learners the opportunity to voice their opinions on how they were, or were not, taught communication skills at school and in higher education” (see [7]).

We reach to a conclusion that it is important to investigate Communicative Language Teaching approach practice in Omani context—as it was considered as necessary towards developing students’ English level proficiency as stated in the Omani literature. In addition to that, due to the importance of equipping students with communication skills before they graduate from higher education Institutes in Oman, the Omani literature should explore what is in the preparation stage and how such skills are practiced and how they influence students’ learning and motivation. In order to achieve that, this study will tackle the use of CLT from teachers’ perspective and the perceived difficulties and challenges in the stage of implementing CLT in tertiary level in Oman.

1.3 Research Questions

The study seeks answers to the following research questions

1. What are EFL teachers’ attitudes towards CLT in Omani Universities?
2. What are the major problems of implementing CLT in language classes as perceived by EFL teachers?
3. Is there any relationship between CLT attitudes and difficulties of implementing CLT in language classes as perceived by EFL teachers?

1.4 Communicative Approach

To start with, “The basic insight that language can be thought as a tool for communication rather than as sets of phonological, grammatical and lexical items to be memorized led to the notion of developing different learning programs to reflect the different communicative needs of disparate groups of learners” (see [8]). Since learning language is considered as a tool for communication, there has been an urgent necessity to modify the approaches used in the field of teaching the languages to meet this need. Based on this need for communication, communicative language teaching has been established as an approach for teaching. “CLT starts with a theory of language as a communication and its goal to develop learners’ communicative competence” (see [9]). “Teacher selects learning activities according to how well they engage the students in meaningful and authentic language use rather than in the merely mechanical practice of language patterns” (see [9]).

Therefore “CLT is characterized by a focus on communicative function; a focus on meaningful tasks rather than on language per se (e.g., grammar or vocabulary study) and the efforts to make tasks and language relevant to a target group of learners through an analysis of genuine, realistic situations, the use of authentic, from life materials, the use of group activities and the attempt to create a secure, and non-threatening atmosphere” (see [9]). From the researcher’s point of view, the diversity of the activities that is used in CLT will facilitate learners’ creativity in learning the language and therefore their level of motivation will be increased.

1.5 Teacher Cognition About CLT in EFL Context

The reason for conducting researches about teachers’ beliefs and attitudes towards communicative language teaching approach was due to many reasons as it had been stated in literature. Studies about cognition considering CLT and its implication in EFL have been done for different reasons. [10] summarized the outcomes of different studies that represent teachers’ beliefs towards CLT. Firstly, it had been stated that “even though second language (L2) teachers are encouraged to use CLT in their language classrooms, the majority of them seem to have failed to deliver genuinely communicative instruction” [10]. The result of implementing CLT led to some difficulties and challenges which had encouraged more investigation in this field. Moreover “the efficacy of using CLT in teaching English as a foreign language (TEFL) remains a controversial topic” (as cited in [10]).

In the literature, the difficulties of implementing CLT can be due to the complexity of implementing CLT in EFL as it was confirmed by [10] “The use of CLT involves the teachers’ perspectives in a process of understanding, perceiving, and situating CLT: Understanding CLT reflects the teachers’ perspectives of the language approach in the epistemic dimension, ‘perceiving CLT’ indicates their perspectives in the perceptual dimension, ‘situating CLT’ reveals their perspectives in the situational dimension, they are working dynamically to shape teachers’ CLT practice”.

Abebe et al. [11] study aimed to achieve the following: “to examine the extent language instructors use CLT methodology in the course they offer, to assess the type of active learning methods they utilize effectively in their classroom and to see the impact of the methodology they use have on the students’ performance”. The result of the study which has been conducted to explore beginning teachers’ perspectives of CLT and the result are not considered as different from the previous findings from other studies done in different context. The result of the study collected revealed that as “there are shortage of up to date teaching

materials, lack of experience on the part of instructors and problems of using different active learning methods in order to implement CLT methodology effectively and efficiently in their teaching-learning process” (see [11]).

The findings revealed that the studies which have been done about CLT and teachers’ cognition focused mainly on three main areas: CLT practice, CLT impact and challenges and difficulties of CLT implementation. To conclude with, the importance of studying CLT approach in EFL context could be generalized to different context including Omani context where the current study is going to take place.

1.6 Teacher Cognition About CLT in Omani Context

In the Omani context, the literature which investigated teachers’ attitudes and beliefs about communicative language teaching was few and it was not widely explored either at schools or higher education levels. Due to the availability of resources, this current study stated the main two studies which were done in the Omani context about the same topic. For example (see [12]) study aimed to investigate awareness and use of communicative language teaching methodology in a foundation program in higher education in Oman. The study was conducted on an institution of higher education in the sultanate of Oman. The study was conducted as a case study which was appropriate to the nature of the study in that a range of methods are used for collecting and analyzing data. The participants were five non Omani teachers who are from different countries of different nationalities, namely British, Canadian, Indian, and South African from the English language department at the institution. The gender division was 70% female and 30% male. Three instruments were used to collect data, namely, a questionnaire, classroom observation and a semi-structured interview. The observation instrument was designed to measure features of CLT that occur in the classroom.

The results indicated two main findings: the first main finding was that “the lecturers in the English Language Department of the institution have limited knowledge of the CLT approach”, The finding revealed that despite claiming to use a ‘communicative/student centred’ approach, there is no clear evidence that the teacher actually has knowledge of the approach or any type of formal training that would encompass the transmission of this knowledge”(see [12]). That result reflected the lack of teachers’ awareness of importance of communicative language teaching approach in Omani context-and as a result, teachers did not use this approach in their classes as it was stated in the second finding. The second main finding was that “The lecturers in the English Language Department of the institution do not use the CLT approach in the classroom”. “In the absence of

classroom observation it is difficult to confirm this as there is no means of verifying what actually takes place in the classroom. The subject claims to use a ‘variety of approaches’ in the classroom. However, it is unclear whether the subject understands the term ‘approach’ as the underlying philosophy behind a ‘method’ as used in the field of linguistics and second language acquisition, or in more general terms” (see [12]).

The main findings revealed that “the majorities of teachers have inadequate knowledge of the CLT approach and do not use it in the classroom”. This finding agreed with [4] who stated that “in spite of claims about ELT curricula being geared towards communicative language teaching (CLT) and the integration of advanced and sophisticated educational technology into ELT (Ministry of Education 1999, 2008), research has shown that the experience of implementing English through education in the new ambitious ELT national plan in 1999 known as the Basic Education System (BES) has been problematic and thus suffered from major shortcomings”.

McLean [12] suggested that “an adapted version of CLT which embraces local contextual and sociocultural conditions may be pedagogically viable”. McLean [12] study could be considered as the only study that explores teachers’ attitudes towards CLT in higher education. However it was limited to one higher education institution and it was also limited to a small group of teachers. McLean [12] showed an agreement with this following finding: “Western teachers and their communicative approach to language teaching are not suited for the Omani system as it is today. Arab and Indian teachers are much better, linguistically and culturally closer to the students” (see [12]). In addition to that, [13] claims that “Likewise, local teachers are advised to incorporate more communicative approaches and more varied activities”. On the other hand, [23] study was mainly about investigating teachers’ attitudes in public schools in Oman and the aim was to explore how the communicative language teaching approach (CLT) is understood and implemented by EFL teachers in Oman. The study was carried out in school levels but it focused mainly on Omani teachers’ attitudes towards CLT as being EFL teachers.

Therefore it aimed at investigating EFL teachers’ perceptions of CLT use in teaching English as a foreign language (TEFL) and teachers’ perception and teachers background (gender; qualification and levels taught). Ninety-three teachers of English (47 male and 46 female) from both ‘basic’ and ‘general’ education schools in Oman were randomly selected. The study used the attitude scale developed by (see [2]) which covered five themes related to communicative language teaching approach: (1) group/pair work, (2) quality and quantity of error correction, (3) the role and contribution of learners in the learning process, (4) the

role of the teacher in the classroom, and (5) place/importance of grammar.

Those two studies that explored teachers’ attitudes towards communicative language teaching reflected both Omani and non-Omani beliefs about this approach however there was a lack of studies which reflected CLT practice in classroom from teachers’ and students’ perspective either at schools or higher education level. As a result, to find out how such practice of CLT approach could develop students’ communicative competences and motivation towards learning language would be beneficial for English teaching and learning.

1.7 Difficulties of Implementing CLT

In the literature there are studies which focused mainly on finding teachers’ perceived difficulties and challenges related to those four categories: teachers related difficulties, students related difficulties, difficulties related to education system and difficulties related to CLT itself

To start with, [14] study was investigating seventy EFL high school teachers (50 male and 20 female), the beliefs the teachers held about CLT and, the barriers to implementing CLT, and how teachers’ background affected their attitudes towards CLT. The perceived difficulties of CLT implementation questionnaire was originally designed by [15] and consisting of two parts. The first part was designed to elicit the respondents demographic and background information including gender, age, educational background, and years of teaching. The second section assessed the difficulties that Iranian English high school teachers encounter while trying to implement CLT in their classes. This section consists of 18 items. The respondents were asked to rate each item on a four-point Likert scale ranging from 4 (major challenge) to 1 (not a challenge at all). “The results showed that education system to be as an obstacle of CLT implementation. The mean of each category reported shows that Iranian English high school teachers faced obstacles in implementing CLT in their classrooms. “The most challenging difficulties that the participants reported were ‘educational system difficulties’ (M = 3.63), followed by ‘student-related difficulties’ (M = 3.52), ‘teacher-related difficulties’ (M = 3.46), and ‘CLT-related difficulties’ (M = 3.23)” (see [14]).

Ntirenganya [16] also found out that “in regards to teachers related difficulties and challenges, those issues were judged as problematic: Teachers have little time to develop materials for communicative classes (M = 3.50 and s = 1.21); There are few or no opportunities for practicing teachers to get in-service training in CLT (M = 3.13 and s = 1.500); Teachers do not receive or acquire enough knowledge/skills about CLT during their university studies

($M = 3.13$ and 4.41) and Teachers lack knowledge about the target language (English) culture ($M = 3.00$ and $s = 1.15$). On the other hand the following issues considered as minor problems: Some teachers are not willing to adopt CLT because they prefer other teaching methods ($M = 2.69$ and $s = 1.35$); Teachers' proficiency in spoken English is not sufficient ($M = 2.56$ and $s = 1.41$); and Teachers have misunderstandings of CLT ($M = 2.50$ and $s = 1.32$)".

In regards to students' related difficulties and challenges, "The findings of the study indicated that three of the five issues in the category of student-related difficulties were generally rated as problems (with mean ratings ranging from 3.56 to 3.88). Students tend to always use Kinyarwanda while doing pair or group activities indicated ($M = 3.88$ and $s = 1.15$); Students have a passive style of learning and mainly expect to receive instruction from the teacher ($M = 3.63$ and $s = 1.31$) and Students have low level English proficiency ($M = 3.56$ and $s = 1.41$). In contrast, the remaining two issues related to students obtained means that are below 3.00 and can accordingly be considered as minor problems. Students lack motivation for developing communicative competence recorded ($M = 2.81$ and $s = 1.31$) and Students resist participating in communicative class activities ($M = 2.75$ and $s = 1.29$). With respect to CLT related difficulties and challenges, the findings revealed that as the study findings and the participants' comments indicate, Issue #9 (lack of adequate assessment materials or instruments to assess communication skills) was generally seen as problematic. The statement "There is a lack of effective and efficient instruments to assess communication skills, especially speaking and/or writing" indicated the following mean value ($M = 3.44$ and $s = 1.26$) while CLT not taking into account differences between ESL and EFL contexts as a minor problem ($M = 2.56$ and $s = 1.36$). The overall findings revealed that large classes and students' lack of motivation and commitment were considered as being major problems in this context" (see [14]).

To conclude with, [17] stated that "Although CLT has its own difficulties; it can be implemented as one of the appropriate methods in language learning. The self-confidence of the learners is a main factor which is emphasized by CLT through activities such as, role play, group, or pair work. Comparing to traditional methods, teachers do not have the authority over the students in class. They just provide a situation in class for learners to communicate and share their knowledge. It is good to consider teachers' beliefs towards CLT which have been neglected in different studies. There are many teachers who claim that they practice CLT in their own classes, however, they actually apply their own experiences and beliefs. Few studies have been done towards the importance of this factor in language teaching". Such studies suggested investigating teachers' beliefs to find out how they practiced

communicative language teaching in their classes and to overcome any difficulties that might hinder implementing CLT.

1.8 The Relation Between Teachers' Beliefs of CLT and Perceived Difficulties of CLT Implementation

Other studies were conducted to find out the relations between teachers' beliefs towards CLT approach and teachers' beliefs towards CLT perceived difficulties and challenges but it was limited and it was not commonly addressed. For instance, [18] found that "The average score of difficulties questionnaire is 2.8 (while each item was measured by a 4-point Likert scale) indicating that EFL teachers do not find much difficulty in implementing CLT in their classes in general. The highest mean score is related to difficulties caused by the educational system (mean = 3.2), implying that teachers believe that the educational system acts as a barrier in implementing communicative approach in language classes. The means of other factors are not above 3; showing that teachers do not perceive teachers, students, or the communicative approach itself as major obstacles in implementing CLT in their classes". Additionally, [18] used Pearson Product correlation method used to investigate correlation between teachers' beliefs about CLT principles and CLT perceived difficulties and challenges. The results of the analysis showed that in general, "CLT attitudes and perceived difficulties of CLT implementation were not related ($r = -.01$). However, when subscales of the two questionnaires were considered, three correlations were found to be statistically significant. CLT attitudes as a whole were found to be inversely and significantly related to difficulties caused by students in communicative classes ($r = -.160$, $p < .05$). This finding shows that those teachers who have general positive attitudes towards CLT do not consider students as a major obstacle in implementing CLT in language classes. Further, attitudes towards 'the role of teacher in a communicative class', were found to be positively related to CLT related difficulties ($r = .181$, $p < .01$). In other words, those who have favourable attitudes to the role of teachers in the communicative classes believe that the problems of CLT are mainly related to the approach itself. Also, attitudes towards 'group and pair work in communicative classes' were significantly and inversely related to 'student-related difficulties of CLT' ($r = -.156$, $p < .05$). It means that those teachers, who have positive attitudes towards group work in CLT, believe that students cannot be a source of difficulty in implementing communicative approach in language classes".

The results of [18] revealed that "Iranian teachers have general positive attitudes towards CLT and it was found that

the only obstacle teachers perceived to face in implementing CLT in language classes is created by the educational system of Iran. They believed that factors such as: lack of enough support from administration, lack of authentic materials, incompatibility of traditional view towards teachers and learners' role with CLT, ineffectiveness of large classes for experiencing CLT, and negative impact of grammar-based examinations on the use of CLT, are the major impediments in using CLT in Iran. The findings also showed that teachers' favourable and positive attitudes towards CLT were not related to difficulties they experienced in their classes in general". Our study will investigate such an important issue to find out the relation between teachers' beliefs towards CLT principles and teachers' beliefs towards CLT perceived difficulties and challenges.

2 Method

2.1 Participants

The selected sample was made by teachers in foundation Institutes in higher education in Oman, represented in two universities. The participants of the current study were 24 EFL teachers who worked in Omani tertiary level in the academic year 2014–2015.

2.2 Instruments

In this study, the attitudinal measure was carried out to gather data about teachers' beliefs and attitudes about communicative language teaching principles. Creswell [19] defines "attitudinal tool to be used to measure feelings towards educational topics (e.g. assessing positive or negative attitudes towards giving students a choice of school to attend)". Creswell [19] also mentioned one drawback of attitudinal measures which is that "they did not provide direct evidence of specific behaviours".

Attitudes towards CLT Questionnaire. The questionnaire which was used to collect data about teachers' cognition about CLT in higher education in Oman was adapted from previous studies that investigated similar themes in EFL context but in different contexts. In this study, teachers' questionnaire aims to explore teachers' attitudes towards CLT (see in [2]). It also aims to find out about constraints and facilitators of CLT approach implementation [15, 20].

The two questionnaires that were used in this study were: Attitudes towards CLT Questionnaire, and Perceived Difficulties of CLT Implementation Questionnaire. In regards to teachers' perception of CLT and its principles, an attitude scale was used to investigate teachers' attitudes toward principles of CLT. It was originally developed by [2], and it

was used in different EFL context to investigate the same topic. It covered five themes relating to communicative language teaching approach. The organization of different statements was based on [21] study which validated the scale with a confirmatory factor analysis. The researchers randomized the 24 items of the scale, and distributed it to 104 teachers from high schools and institutes in order to confirm the subscales (group work 2, 9, 13, 21, 22; Error correction 6, 10, 14, 15; learners role 4, 5, 8, 11, 18, 20; teacher role 7, 16, 19, 24; and role and importance of grammar 1, 3, 12, 17, 23 (See Appendix A Teachers' questionnaire).

The scale had 24 statements on a five-point scale in the Likert format, in which 12 were favorable items, and 12 unfavorable items. The statements were anchored from strongly agree = 5, agree = 4, uncertain = 3, disagree = 2, to strongly disagree = 1. The reliability of the questionnaire was calculated by [2], utilizing the split-half method. The correlated split-half reliability coefficient was .81 which is a relatively high and acceptable index and additionally [21] the overall internal consistency of the questionnaire was calculated using Cronbach alpha (CA) was 0.7924 pointed. In regards to our study, the overall result showed that the overall internal consistency of the questionnaire using Cronbach alpha was .847 which revealed that level of reliability in current study was achieved.

Teachers' attributions about CLT implementation difficulties. This section consisted three different parts. The first part was adapted from [20] study which mainly focused on finding out the factors which could facilitate and hinder the implication of CLT, the use of semi structured interview has revealed the result that show those main factors. In this study those factors have been used to state questions in the survey to collect data about those factors either to consider as being facilitator or constraint in the Omani context. Even though this section was designed to collect data about which factors facilitate or hinder CLT implementation, it was decided to delete it. Before conducting the piloting study, it has been necessary to revise the teachers' questionnaire with an expert who is working with the group of participants in the study; he had suggested that the questionnaire could be taking more time from teachers so they will not be willing to participate. Then he suggested that this question is to certain extent similar to the content of the second part of the same section, so it has been decided to be deleted since it will not affect the data collection to get an answer for the sated question.

The second part of this section was four Likert formats which were used to find out about constraints and facilitators of CLT implementations. The survey is adapted from [15] study done to explore EFL teachers from Turkey. Ozsevik [15] survey explored the participants' opinions with regard to the perceived difficulties and challenges in adopting CLT in their classes. The difficulties and challenges in this section

were divided into four categories: teacher-related difficulties, student-related difficulties, difficulties related to the educational system, and CLT-related difficulties. For each of these categories, the participants were asked to choose from a 4-point scale: 4 = major challenge, 3 = challenge, 2 = mild challenge and 1 = not a challenge at all.

The overall internal consistency of the questionnaire was calculated using Cronbach alpha (CA) was .893 pointed. In comparison, [15] reported the Cronbach coefficient alpha of the same questionnaire was 0.80. Furthermore, the reliability calculated in [14] study was 0.84 using the Cronbach coefficient alpha. The results showed that in comparison to the original study done by [15], the reliability of current study achieved high internal consistency.

3 Results

In order to answer research questions one and two descriptive statistics were used. Table 1 summarizes 24 EFL teachers' means and standard deviations on Attitudes towards CLT Questionnaire and Perceived Difficulties of CLT Implementation Questionnaire and their subscales.

3.1 Teachers' Beliefs of CLT Principles

The overall analysis of findings revealed that teachers' beliefs towards group and pair work recorded the highest mean scores ($\bar{x} = 4.07$ and $s = .69$) which means that teachers who are working in the Omani context has shown a great interest in encouraging students to work in pairs and groups. On the other hand, teachers beliefs towards the role and contribution of learners in the learning process achieved the second highest mean ($\bar{x} = 3.79$). It was obvious that that those group of teachers encouraged more involvement of Omani learners in learning English and to create a more learner-centered classroom environment which is mainly related to CLT practice. The role and importance of grammar in the classroom had a mean value ($\bar{x} = 3.78$). The findings showed that role of teacher in the classroom ($\bar{x} = 3.64$) and the quality and quantity of error correction ($\bar{x} = 3.45$) indicated to lowest interest of teachers in the Omani context as it had been shown in Table 3. Overall, teachers who

worked in Omani context reported high mean scores towards different CLT principles and results indicated mean scores above 3.50 however teachers only recorded low mean score associated with CLT quality and quantity of error correction. What is noteworthy is that teachers did not show any negative attitudes towards CLT as the means of none of the subscales is lower than 3.

3.2 CLT Difficulties and Challenges Teachers' Perception

This section is presenting the findings that show the factors which could be considered as challenging for promoting or hindering the implication of communication language teaching practice. The responses used the Likert scale from 1 to 4; 1 = Not a challenge at all, 2 = Mild challenge, 3 = Challenge, 4 = Major challenge to assess the CLT difficulties and challenges from teachers' perception.

The Table 2 has shown results that represent different factors which influence CLT implementation in Omani context. The major aspect which would be considered as a major challenging to implement CLT in classroom was students related difficulties and it obtained mean rating ($\bar{x} = 2.61, s = .800$). The second major challenges which could hinder CLT practice was CLT related difficulties and challenges and it obtained mean ratings ($\bar{x} = 2.08$). While the other two aspects associated to education system and teacher related difficulties had indicated the lowest mean rating ($\bar{x} = 1.86$ and $\bar{x} = 1.42$). Due to limited number of participants of teachers and due to reason of being non Omani teachers, overall results did not show that teachers found those aspects of (students, teachers. education system and CLT approach) to be problematic in Omani context. However, students related difficulties and challenges recorded the highest mean results compared to other aspects.

3.3 The Relation Between Teachers' Beliefs Towards CLT and Their Beliefs Towards Challenging of CLT Implementation

The Pearson Product-moment correlation was computed to investigate the relationship between teachers' beliefs about

Table 1 Teachers' beliefs of CLT principles

	Mean	Standard deviation
BEL teachers' beliefs-CLT-group/pair work	4.0729	.69344
BEL teachers' beliefs-CLT-quality/quantity of error correction	3.4583	.69808
BEL teachers' beliefs-CLT-the role and contribution of learners in the learning process	3.7986	.59786
BEL teachers' beliefs-CLT-the role of the teacher in the classroom	3.6458	.58475
BEL teachers' beliefs-CLT-place/importance of grammar	3.7889	.63738

Table 2 Teachers' beliefs of CLT difficulties and challenges

	Mean	Deviation (s)
CHA teacher-related-difficulties and challenges	1.4258	.41987
CHA student-related-difficulties and challenges	2.6146	.80074
CHA difficulties and challenges related to education system	1.8638	.72481
CHA CLT-related-difficulties and challenges	2.0870	.83010

Table 3 Correlation teachers' beliefs of CLT and CLT difficulties

		Teacher-related-difficulties and challenges	Student-related-difficulties and challenges	Difficulties and challenges related to education system	CLT-related-difficulties and challenges
tf07—BEL teachers' beliefs-CLT-group/pair work	Pearson correlation	-.530	-.353	-.042	-.117
	Sig. (2-tailed)	.011	.090	.850	.595
	N	22	24	23	23
tf08—BEL teachers' beliefs-CLT-quality/quantity of error correction	Pearson Correlation	-.455	-.502	-.052	-.326
	Sig. (2-tailed)	.033	.013	.814	.129
	N	22	24	23	23
tf09—BEL teachers' beliefs-CLT-the role and contribution of learners in the learning process	Pearson Correlation	-.324	-.468	-.143	-.046
	Sig. (2-tailed)	.142	.021	.515	.834
	N	22	24	23	23
tf10—BEL teachers' beliefs-CLT-the role of the teacher in the classroom	Pearson Correlation	-.304	-.327	.025	-.146
	Sig. (2-tailed)	.168	.118	.910	.507
	N	22	24	23	23
tf11—BEL teachers' beliefs-CLT-place/importance of grammar	Pearson Correlation	-.132	-.179	.249	-.130
	Sig. (2-tailed)	.559	.402	.251	.555
	N	22	24	23	23

CLT principles and their beliefs towards perceived difficulties and challenges of CLT implementation. As seen in Table 3 it was found generally that teachers' attitudes towards CLT and their attitudes towards the perceived difficulties and challenges of CLT implementation were correlated inversely and recorded statistically significant results as following:

Teachers who reported higher scores about group and pair work tend to have lower scores in regards to beliefs about teachers related difficulties and challenges ($r = -.530$ and $p = .011$). The findings showed that the Pearson correlation coefficient was statistically significant and the correlation was moderate and negative. The finding indicated that

teachers who had positive attitudes towards group and pair work believed that teacher related difficulties was not considered as an obstacle of implementing CLT. In general, when teachers have more favourable attitudes towards group and pair work, they stated that they did not perceive those different challenges (teachers, students, education system and CLT) as obstacles to implement CLT in their classes. In addition to that, the findings revealed that the correlation between teachers' beliefs about group and pair work and students related difficulties and challenges was negative but it was not statistically significant ($r = -.353$ and $p = .090$).

The analysis of findings revealed that higher teachers' beliefs reported about teachers' beliefs CLT quality/quantity

of error correction tend to have lower teachers' beliefs rate about the perceived difficulties and challenges related to teacher. The correlation coefficient was statistically significant and it was moderate and negative ($r = -.455$ and $p = .033$). In addition to that, results showed that the correlation coefficient between teachers' beliefs about CLT quality/quantity of error correction and teachers beliefs about students related difficulties and challenges was statistically significant ($r = -.502$ and $p = .013$). As it had shown from the results that this correlation was negative which means that teachers who scored higher beliefs rates about CLT quality/quantity of error correction did not encounter students as perceived difficulty that hinder implementation of CLT. On the other hand the correlation coefficient between teachers' beliefs of CLT quality/quantity of error correction and teachers' beliefs about CLT related difficulties and challenges was negative and weak and it was not statistically significant ($r = -.326$ and $p = .129$). Generally, teachers who had favourable attitudes towards quality/quantity of error correction did not consider teachers and students related difficulties and challenges as perceived problems that hinder CLT implication.

Teachers who reported higher scores about the role and contribution of learners in the learning process tend to report lower scores about students related difficulties and challenges. The Pearson correlation coefficient was statistically significant and it was moderate and negative ($r = -.468$ and $p = .021$). The finding indicated that teachers who had reported higher beliefs about the importance and the role of learners and their contribution to the learning process did not encounter students' related difficulties and challenges as a perceived problem which could hinder the implication of CLT in their classes. In addition to that, those group of teachers did not perceive teachers related difficulties and challenges as an obstacle but the Pearson correlation teachers beliefs about the role of learner and the teacher related difficulties and challenges was weak and negative and it was not statistically significant ($r = -.324$ and $p = .142$).

The coefficient correlation between teachers beliefs of the role of teacher in classroom and teacher related difficulties and challenges was ($r = -.304$ and $p = .168$) and the coefficient correlation between teachers beliefs of the role of teacher in classroom and students related difficulties and challenges was ($r = -.327$ and $p = .118$). Even though the results indicated that the correlation between teachers beliefs about the role of teacher in the classroom and teachers and students related difficulties and challenges was not statistically significant, there was negative relation which indicated that teachers who reported higher scores and believed on the role of teacher in the classroom did not consider neither teachers related difficulties nor students related difficulties as problems that hinder CLT implementation.

4 Discussion

The primary goal of this study was investigating the level of EFL teachers' attitudes towards CLT and the problems they face in implementing this method in their classes focusing on the Omani Context. The study also probed into the relationship between EFL teachers' CLT attitudes and its implementation challenges.

The analysis of results indicated that participants were in favour of group and pair work and they reported the highest mean scores compared to other CLT principles, while participants recorded lowest scores considering the quality and quantity of error correction. The findings revealed that participants who were teaching in Omani context showed more favourable attitudes towards encouraging more group and pair work in their classes while they did not believe on the importance of correcting each single mistake of their students. In terms of the importance of group and pair work, the results agreed with [18] study which stated that "EFL teachers had overall positive attitudes towards CLT. The highest mean is related to 'group/pair work' implying that teachers have highly positive attitudes towards implementing group work in language classes". In addition to that, our finding is also consistent with [14] study which concluded that "teachers had most favourable attitudes towards the role of pair/group work activities than the other CLT principles". Ngoc and Iwashita [22] study about the Vietnamese learners' and teachers' attitudes towards communicative language teaching came up with the following result which is similar to our study about Omani context "the results show that both groups had favourable attitudes towards communicative activities such as group and pair". Moreover, [23] study of Omani teachers in schools showed an agreement with our findings revealing that teachers recorded the highest mean ratings associated with the group and pair work. The reason as it had been mentioned by [24] study that "It can be argued that teachers' positive attitudes towards group and pair work are moved by the benefits of promoting collaboration among the students, and developing communicative competence while working in groups. Teachers might perceive the need of providing students with scaffolding and learning experiences through the interaction among the students".

Additionally, as students need to experience or practice communicating in the target language through negotiating meaning with others to develop communicative competence, pair/group work provides students the chance to practically experience the language. The analysis of findings indicated that the average score of difficulties questionnaire is 2.00 (while each item was measured by a 4-point Likert scale) indicating that participants working in the Omani context did not find much difficulties in implementing CLT in their classes in general. This finding is consistent with [18] study

which demonstrating that EFL teachers do not find much difficulty in implementing CLT in their classes in general. [18] found that “The average score of difficulties questionnaire is 2.8”.

The results showed that participants in Omani context recorded students’ related difficulties and challenges as the highest, followed by CLT approach while the other two aspects related to education system and teachers recorded very low means. On the other hand, [18] study results indicated that “The highest mean score is related to difficulties caused by the educational system (mean = 3.2), implying that teachers believe that the educational system acts as a barrier in implementing communicative approach in language classes. The means of other factors are not above 3; showing that teachers do not perceive teachers, students, or the communicative approach itself as major obstacles in implementing CLT in their classes”.

Overall, considering the Omani context as being a foreign language teaching English environment, findings revealed that student’ related difficulties and challenges are considered as a major challenging to apply CLT from participants’ perspectives. The analysis of finding showed that students could be one of main challenges that teachers encountered in implementing CLT in the Omani context. Mainly students who are joining the first year of English language intensive course at University, they graduated from the high schools with low communicative language skills. This result is similar to [9] results that “teachers regarded low level students’ strong resistance to communicative activities as a limitation in using CLT”. Li [9] stated that “only some of the high level students enjoyed doing communicative activities. Poor students resented communicative activities. They had nothing to say or could understand little of what their peers said which caused strong resistance to CLT”.

In addition to that, in Omani context even though school curriculum was learner centered approach based but it did not encourage more use of language for communication; students graduated and they still lack such abilities to use English. In addition to that, the curriculum used was Omani context limited so the use of communicative and intercultural activities was limited in their classes. The students came to university with lack of independent learning skills, therefore, it had been found that teachers thought that ‘students having a passive style of learning as one of the problematic issue for them to implement CLT in their classes’. From researcher’s personal experience of teaching, Omani students were not confident to use language for communication; they found it easily to communicate in Arabic their mother tongue with their peers in the classroom rather than using English as a tool for communication. Likewise [25] study found some of these challenges in Saudi context such as “students have low-level English proficiency and students lack motivation for developing communicative

competence”. Moreover [26] study which had been done in Bangladesh context indicated similar findings to the Omani context. The analysis of findings showed that “student related difficulties and challenges such as learners’ low level of proficiency; learners’ passive style of learning and their resistance to participate in communicative class activities was the second major category of constraint of CLT application after teacher related difficulties and challenges which considered as the first major problem”. This finding was in line with our study of Omani context as EFL context which also considered learners as major challenges which hinder the implementation of communicative language teaching approach. Jafari [14] study about Iranian students also found similar findings that considered student related difficulties and challenges as obstacles to implement CLT and the mean score was (3.52).

The findings showed that teachers’ beliefs towards group and pair work correlated statistically and inversely with teachers’ related difficulties and challenges. The findings showed that the Pearson correlation coefficient was statistically significant and the correlation was moderate and negative. The finding indicated that teachers who had positive attitudes towards group and pair work such as ‘group work activities are essential in providing opportunities for co-operative relationships to emerge and in promoting genuine interaction among students’; ‘group work allows students to explore problems for themselves and thus have some measure of control over their own learning’ and ‘It is therefore an invaluable means of organizing classroom experiences’ believed that teacher related difficulties was not considered as an obstacle of implementing CLT in their classes. Even though it was found that those teachers’ beliefs about group and pair work related significantly and inversely to difficulties caused by teachers in the classroom, it was found that teachers’ beliefs about group and pair work to be inversely but non significantly related to difficulties caused by students. This findings agreed with [18] study which reported that “attitudes towards group and pair work in communicative classes were significantly and inversely related to ‘student-related difficulties of CLT’ ($r = -.156, p < .05$)”. The results revealed that teachers who believed on the importance of group and pair work to be applied in the classes did not consider students or teachers as problems to implement Communicative Language Teaching approach.

The analysis of findings also revealed that higher teachers’ beliefs reported about teachers’ beliefs towards quality/quantity of error correction tend to have lower teachers’ beliefs rate about the perceived difficulties and challenges related to teacher. The correlation coefficient was statistically significant and it was moderate and negative. The results showed that the correlation coefficient between teachers’ beliefs about quality/quantity of error correction and teachers’ beliefs about students’ related difficulties and

challenges was statistically significant. As it had shown from the results that the correlation was negative which means that teachers who scored higher beliefs rates about quality/quantity of error correction did not encounter students as perceived difficulty that hinder the implementation of CLT. In other words, teachers who reported higher mean responses about 'For students to become effective communicators in the foreign language, the teacher's feedback must be focused on the appropriateness and not the linguistic form of the students' response to be moved to error correction section and Since errors are a normal part of learning, much correction is wasteful of time' did not find either students or teachers related issues as problematic. Generally, teachers who had favourable attitudes towards quality/quantity of error correction did not consider teachers and students related difficulties and challenges as perceived problems that hinder CLT implementation. On the other hand, the correlation coefficient between teachers' beliefs of quality/quantity of error correction and teachers beliefs about CLT related difficulties and challenges 'Western educational assumptions are not suitable within Asian contexts and CLT doesn't take into account the differences between EFL and ESL teaching contexts and there is a lack of effective and efficient instruments to assess communicative competence' was negative and weak and it was not statistically significant.

Teachers who reported higher scores about the role and contribution of learners in the learning process tend to report lower scores about students related difficulties and challenges. The Pearson correlation coefficient was statistically significant and it was moderate and negative. The finding indicated that teachers who had reported higher beliefs about the importance of learners and their contributions to the learning process in following areas: 'The learner-centered approach to language teaching encourages responsibility and self-discipline and allows each student to develop his/her full potential', 'for most students language is acquired most effectively when it is used as a vehicle for doing something else and not when it is studied in a direct or explicit way' and 'Tasks and activities should be negotiated and adapted to suit the students' needs rather than imposed on them' did not encounter students' related difficulties and challenges as a perceived problem which could hinder the implication of CLT in their classes. So teachers did not consider 'Students having low-level English proficiency', or 'Students having a passive style of learning', 'Students lack motivation for developing communicative competence' or 'Students resist participating in communicative class activities' as obstacles to implement CLT. The reason might be that teachers who believed on their students' abilities to learn a foreign language had positive attitudes towards CLT approach as being a learner centered approach that focus mainly on learners. This corroborates with the findings of this study "Teachers'

favourable attitudes toward CLT in general were inversely related to difficulties caused by students in communicative classes. This implies that teachers who had general positive attitudes towards CLT had fewer problems with difficulties caused by students such as students' low-level of English proficiency, their passive style of learning, their resistance in participating in communicative class activities, and their lack of motivation for developing communicative competence. In other words, general positive attitudes toward a learner-centered approach of teaching help teachers manage their classes more successfully" [18] and thus feel less difficulty in using CLT in their classes.

Even though the results indicated that the correlation between teachers' beliefs about the role of teacher in the classroom and teachers and students related difficulties and challenges was not statistically significant, there was still negative relation which indicated that teachers who reported higher scores and believed about the role of teacher in the classroom did not consider neither teachers related difficulties nor students related difficulties as problems that hinder CLT implementation. This finding was not in line with [18] study which found that attitudes towards "the role of teacher in a communicative class, were found to be positively related to CLT related difficulties ($r = .181, p < .01$)".

5 Conclusions

To conclude with, investigating teachers' beliefs and perceptions towards Communicative Language Teaching is a valuable source of knowledge for practitioners and stakeholders to improve the quality of language teaching, to improve the curriculum and to develop the teaching methodologies. That would not be achieved unless more future studies conducted to explore practice of communicative language teaching approach in English language classes and how it is applicable for our students. Additionally, there should be more studies focusing on finding out why Omani students who joined higher education still struggle with English and those studies should involve students to give their own opinions and how to overcome such challenges.

Additionally, future studies recommended investigating Communicative Language Teaching approach form communicative competence model aspect and recommended conducting more studies using classroom observation to find out what is practiced in classroom from teachers' and learners' perspectives. In addition to that, documents analysis would be suggested to come up with an understanding of teaching materials used and the benefits of such materials to develop students' communicative competences. Ozsevik [15] stated that it would be "more reliable results with multiple data sources incorporating a survey questionnaire

for teachers, a survey questionnaire for students, classroom observations, and in-depth interviews with the teachers observed and using data from multiple sources would allow triangulation, and thus benefit the overall results of this study”.

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The Role of Sustainable Management in Small and Medium Enterprises, with Reference to Interior Design Firms in the Kingdom of Bahrain

Hisham Al-Azzawi[✉] and Amna Hasan[✉]

Abstract

As Small and Medium size Enterprises (SMEs) grow and expand, certain issues and social demands come up with this growth including the firms' responsibility towards ethical and social benefits, environmental issues and economic prosperity. SMEs go through these challenges while they experience financing difficulties and profitability priorities. The literature review, both internationally and locally, shows insufficient knowledge and information in relation to the implementation of sustainable management in SMEs. The basic attention was directed towards the production of sustainable products but not the sustainable management of these firms and hence the latter being the general problem area of this research. The research started with exploring the availability of sustainable management practices in the Kingdom of Bahrain (KOB). Through the Ministry of Industry and Commerce (MOIC) it was clearly stated that SMEs play a huge role in the KOB since 99% of registered businesses are SMEs, which, drove the Ministry to develop an SME toolkit reassuring the importance of starting SMEs in the KOB and moving towards developing a business. The research focuses on the practices of sustainable management in the KOB and the aim is to investigate and assess the implementation and effectiveness of sustainable management in SMEs. The research ends up with a proposed model that would hopefully contribute to more effective integration of sustainability practices into the management of interior design SMEs in the KOB.

Keywords

Small and medium enterprises (SMEs) • Sustainable management • Interior design firms • Kingdom of Bahrain (KOB)

1 Introduction

Sustainability is becoming a new trend in our lives today. It is both a way of thinking and a lifestyle. The application of Sustainability is incorporated in almost all aspects of living. According to World Commission on Environment and Development (WCED) (1987), Sustainable development and management refers to “the development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” This research aims to discuss and address the topic of Sustainable Management of interior design Small and Medium Enterprises (SMEs) in the Kingdom of Bahrain (KOB).

Sustainable Development and Management is defined as “adopting business strategies and activities that meet the needs of the enterprise and its stakeholders today while protecting, sustaining and enhancing the human and natural resources that will be needed in the future” [1].

Generally, the argument is that the goal of Sustainable Development and Management is to maintain the balance between social wellbeing, environmental quality and economic prosperity. This explains the balance between the following three values. [2] and [3]:

- Social wellbeing; business responsibility towards ethical and social benefits.
- Environmental quality; ecological measures, responsibility and improvements.
- Economic prosperity is about quality, price and cost.

Based on the above definitions, it can be also stated that sustainable management of a business is a term that refers to

H. Al-Azzawi (✉) · A. Hasan (✉)
Royal University for Woman, Riffa, Kingdom of Bahrain
e-mail: halazzawi@ruw.edu.bh

A. Hasan
e-mail: amnashubbar@gmail.com

the ability of a company to properly manage three areas; social, environmental and economic in a hierarchical way to the related issues in business. It is about the business image and its effectiveness in managing the three responsibilities stated.

2 Research Objectives, Hypothesis and Scope of Study

The aim of this research is to explore and assess the effectiveness of sustainable management of interior design SMEs in the KOB. In order to address this aim, the research seeks to achieve the following as specific objectives:

1. Identifying the concept and scope of Sustainable Management in SMEs.
2. Defining the obstacles that affect Sustainable Management integration in SMEs in the KOB.
3. Proposing a framework to implement and measure Sustainable Management in the KOB by adjusting global models and criteria in relation to the KOB's culture.

In order to achieve the above objectives the following hypotheses are tested:

- **H1** Sustainable Management has an affective role in the success and growth of interior design SMEs
- **H2** High cost and profitability issues affect sustainability integration in design SMEs
- **H3** Sustainable Management SMEs in the KOB can be measured using global criteria customized to the KOB.

The research identified the scope of the study to cover interior Design SMEs in the KOB in general. According to Table 1, the KOB has a total number of 5689 SMEs accounting for 6.15% of the number of economic units in the KOB.

The result shows that of over 1783 registered SMEs [4]. However, a big number of these SMEs were construction firms (building, electrical, engineering, maintenance), which was not the within the major of the design management research area; therefore, the search restricted the scope of the sample to cover only interior design SMEs. According to

MOIC Statistics [4], the total number of interior design SMEs is 94 firms. All of them are Bahrain-based and operating in the KOB.

3 The Importance of Sustainable Management and SMEs the KOB

Sustainable Management is extremely important to the Bahrain's 2030 Economic Vision. A vision, which was established in 2008 under his Majesty King Hamad Bin Isa Al Khalifa. The Vision's main goal is changing the economy and income of the KOB from a Petroleum based economy to a productive, dynamic economy based on businesses that can compete in the global market. This vision was developed to insure a better life for Bahrainis. It focuses on three main principles, which are sustainability, fairness and competitiveness according to the Bahrain Vision 2030 [4] and [5].

As, the government of the KOB wants to move from a petroleum based income into a business based incomes an important piece of information is noted, which is, that according to the Ministry of Industry and Commerce (MOIC) 99% of the businesses in the KOB are registered as small and medium enterprises (SMEs). This brings to attention the idea of addressing the importance of sustainable management in SMEs in the KOB. SMEs have no clear and defined global definition since this is dependent on a number of variable determinants such as the company size, company budget or capital, net assets and the number of employees registered for this company.

One of the common definitions of SMEs is the one provided by the World Bank, which refers to SMEs as having up to 50 workers and total assets of up to 3 million US dollar. It also defines the medium enterprise as having up to 300 employees, total assets and total sales of up to 15 million US dollar.

Although SMEs have minimal importance as individual business entities, they represent a major contribution to the economy considered collectively. SMEs represent 99% of the companies registered in the KOB Table 2 shows the definition of SMEs according to the KOB [3]. According to the 2030 Economic Vision the KOB plans to increase SMEs sectors GDP contribution to 35% in the next three years. Also SMEs have been important job creators as 37% of the

Table 1 The number of economic units by size accumulated up to 1/4/2016 [4]

Number of economic units	Total	Medium	Small
Total number	92,531	1017	5689
%	100.00	1.1	6.15

Table 2 Definitions of SME’s according to MOIC [4]

Ministry of Industry and Commerce SME definition (19/09/2010)			
Category	Number of employees	Capital investment (BD) (manufacturing sector)	Annual turnover (BD) (all sectors)
Micro	Up to 10	Up to 20,000	Up to 100,000
Small	11–50 (up to 100 for construction sector)	20,001–500,000	100,001–1 million
Medium	51–250 (up to 400 for construction sector)	500,001–3 million	1,000,001–5 million

private sector’s employment opportunities are coming from SMEs.

4 Global Models: Sustainable Management Measurements and Integration

Sustainable Management Measurements provides evidence whether a business is successful in its integration of sustainability or not. The broad dimensions and components of sustainable management are usually detailed into more specific elements [2]. The function of these elements is to measure the effectiveness of sustainable practices of a firm’s management. Hart and Milstein developed a framework that examines the sustainability value of firms including internal and external issues (Fig. 1) [2]. The internal issues assess pollution, consumption and waste. The external issues focus on the demands of society from the business. In order to cover these two issues, it is essential that firms use clean energy, reduce the human impact on the environment and maintain a clear sustainability vision.

To effectively use this model, businesses should make changes not only to their operational practices financial or

natural resources, but also to their management strategies and policies including mission and vision [2] (Fig. 2).

Also, Jantje Halberstadt and Matthew Johnson developed a Quick-Check and Reporting Scheme (QCS) in 2014. Their scheme has three stages [3].

It can be concluded that sustainability measurement and integration models aim at assessing the success of companies in their sustainability profiles. The global models are based on filling in the gaps and drawbacks of current sustainability management of firms. These models view the current situation of sustainability in the company, without giving attention to the future considerations such as the future energy needs. However, they provide a valuable insight into how firms can be ranked and assessed in terms of sustainability.

5 Conducting the Survey and Survey Findings

The literature review showed a gap in research on Sustainable Management in KOB. The survey along with the objectives of the research will try to reduce the gap as much

Fig. 1 Framework examining sustainability management of firms [2]

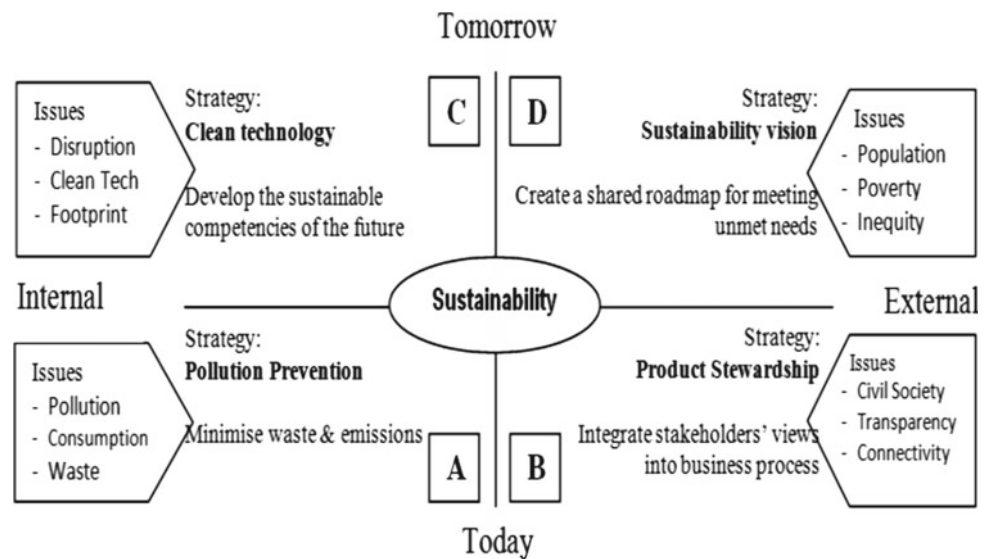
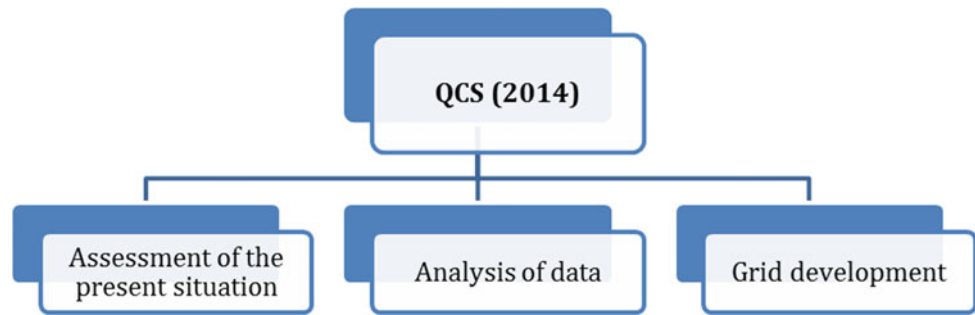


Fig. 2 The QCS scheme, which is based on three stages [3]



as possible. Qualitative and quantitative research methodologies will be used to collect data about Sustainability Integration in managerial operation (management procedures) in interior design SMEs in the KOB.

According to MOIC statistics [4], the total number of interior design SMEs is 94 firms. All of these firms are Bahrain-based and operating in the KOB. With a number of 38 respondents, valid percent of 95% answers, the data reflects a positive concept of sustainability in the viewpoint of respondents. (Table 3). It was found out that the majority of companies believe that sustainability benefits business.

Also other questions tried to determine whether sustainability integration costs high or not. The result reflected a positive response as more than 50% of the respondents said

that sustainability integration costs high and about 40% did not provide a neutral answer (Table 4).

Moreover other questions tried to explore the availability of a declared sustainability policy in the company. Around 50% of the companies have a declared policy of sustainability (Table 5).

As regards to sustainability discussions and meetings (Table 6) allocated for sustainability issues, the results show that only 5% of the interior design SMEs have sustainability issues on their meeting agenda, while more than 50% of them are not sure whether they hold meetings for discussing sustainability issues or not. 40% of the respondents say they do not hold sustainability meetings. Overall, the data reflect the ignorance of sustainability profile in the sample.

Table 3 Bar graph showing whether companies perception about sustainable management benefiting businesses or not in the sample interior design SMEs

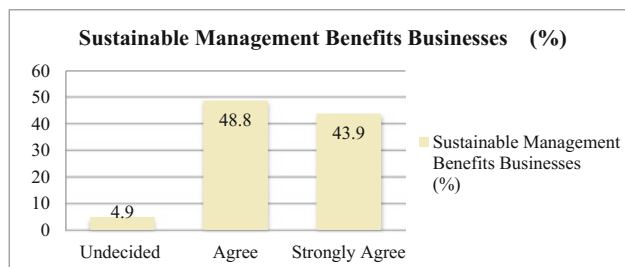


Table 4 Bar graph showing findings about sustainable management integration costing a lot of money

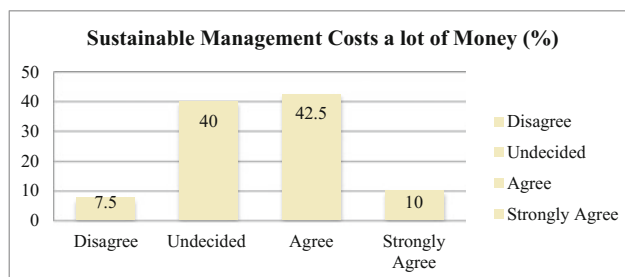


Table 5 Bar graph showing findings about declared policy in the sample interior design SMEs

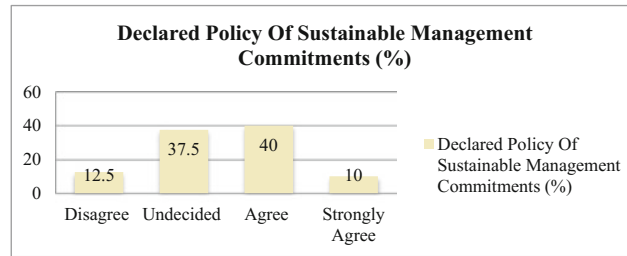
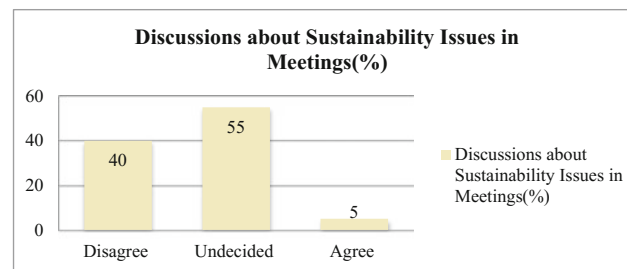


Table 6 Bar graphs showing that the enterprise discusses sustainability issues in meetings in the sample interior design SMEs



Regarding sustainability discussions (Table 6), there is no evidence in more than 50% of the companies that they have sustainability discussions in their meetings, whereas 40% of the companies deny this. It can be argued that sustainability discussions are mostly ignored in the selected companies.

In regards to allocation of budget, (Table 7) illustrates very poor allocation of budget to sustainability management in the SMEs. According to the respondents, 57% SMEs (23 respondents) do not allocate a budget to sustainability management, while 42.5% SMEs (17 respondents) are not sure about such an allocation (Table 6).

The data provided (Table 8) suggest that about 50% of the SMEs have a system for monitoring and measuring sustainability integration in the firm, but a relatively equal

percentage reflect that the respondents are either undecided about such systems or they do not have it.

The results of monitoring and measuring sustainable management in the sample interior design SMEs show that only half of the companies have a system for monitoring and measuring sustainability in the company (Table 9).

The government support in the profile of sustainability management is indicated in (Table 8). About half of the respondents suppose that their interior design SMEs receive government support in their sustainability management. Government support programs may include guiding the activities of the companies to comply with sustainability requirements, provide financial assistance to help small companies implement sustainability programs and also

Table 7 Budget allocation for sustainability plans in the sample interior design SMEs

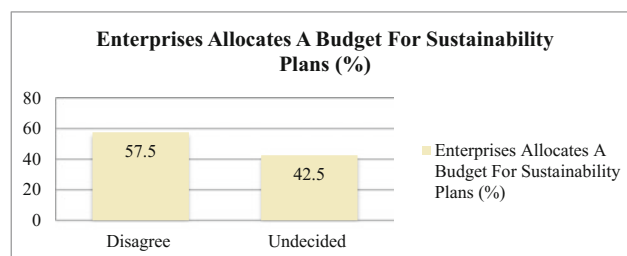
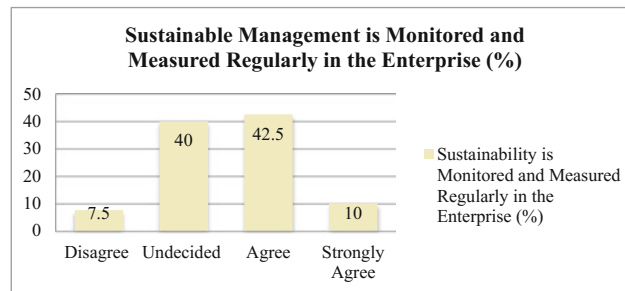
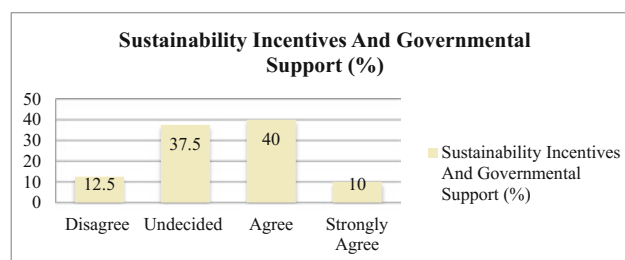


Table 8 Bar graph showing whether sustainable management is monitored in the sample interior design SMEs**Table 9** Sustainability incentives and support are ensured from the government

regulate and monitor the sustainability programs. The government can also provide counseling and training workshops for entrepreneurs and managers.

6 Summary of Findings

It can be clearly concluded that there are a number of weak areas of managing sustainability in the sample of interior design SMEs. Although many interior design SMEs have indications of a clear declared policy of sustainable management, there is no confirmed manifestation of putting principles or plan into effect in their actual operations. Poor budgeting, very few sustainability discussions and unclear monitoring systems and measurement are all signs of ineffective sustainability profile. Other significant findings were;

- It was found that the majority of companies believe that sustainability benefits business. This result can be directly related to the first hypothesis. Accordingly, what can be concluded is that interior design companies realize the value and benefit of sustainability integration into the management.
- Financial cost of sustainable management is high, and so it constitutes one of the barriers of sustainability integration.

- Regarding sustainability discussions, there is no evidence in more than 50% of the companies that they have sustainability discussions in their meetings, whereas 40% deny this. It can be argued that sustainability discussions are mostly ignored in the selected companies.
- It can be concluded that there is no evidence of budget allocation for sustainable management in interior design SMEs in the KOB, and this is another serious issue.
- However, to investigate sustainability monitoring and measurement in the selected companies, the results show that only half of the companies have a system for monitoring and measuring sustainability.

6.1 Sustainable Management Framework for Interior Design SMEs in the KOB

The sustainable management framework for interior design SMEs in the KOB has the following aims:

- Raise awareness of the entrepreneurs and managers about sustainable management and its importance in business.
- Provide a pathway to managers, senior staff and employees for allocating the required budget for sustainability integration.

Table 10 Integrating sustainability into management

Stage 1: framing the issue	Stage 2: preparation & implementation	Stage 3: assessing impact
1. Define the internal and external business and environment drivers 2. Explore the tools and systems 3. Establish a vision and objective 4. Expect barriers	1. Engage with customers, stakeholders, the community and suppliers 2. Communicate the plan 3. Enter into collaboration and partnerships	1. Track performance against goals Report on progress 2. Make necessary changes

- Provide a model for sustainability monitoring and measurement management systems.
- Ensure effective integration of sustainability guidelines into the management of companies.

6.2 Three Areas of Responsibility

The Framework is based on the three sustainability management areas:

Social responsibility, Environmental responsibility and the Economic responsibility. The Framework defines each of the three areas in terms of the tasks, roles and forces that affect the sustainability profile of the business. SMEs review these in relation to their area of business. The three areas of responsibility cover the most commonly occurring issues that affect the business in the community.

Accordingly the integration of sustainability into the management of a business goes through three stages, and each of the three stages has a number of procedures and practices as explained in Table 10.

SMEs are advised to include the procedures and practices in their management systems so that they can ensure building sustainability relations and partnerships with stakeholders, the customers, and the local community regarding the three areas illustrated above.

7 Conclusions and Recommendations

Finally, the research can state the following conclusions;

- The importance of Sustainable Management is that it depends on Social, Economic and Environmental responsibilities for a business to have a Sustainable

Fig. 3 Sustainability and the three areas of responsibility

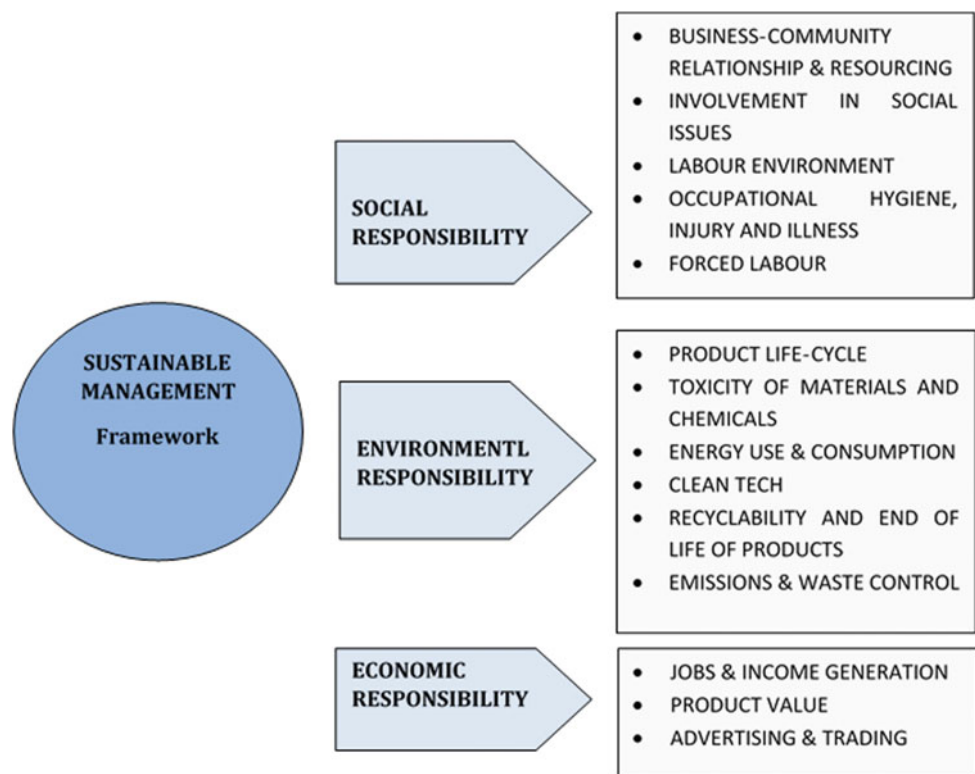
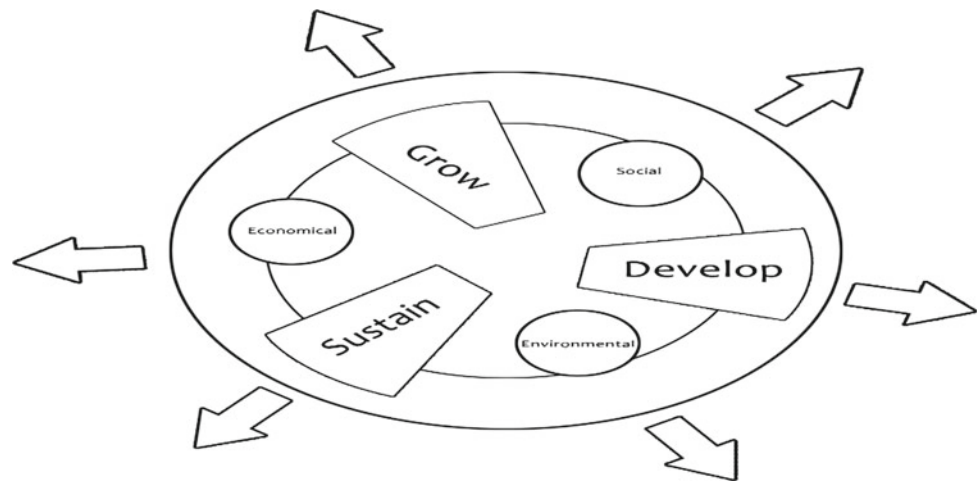


Fig. 4 Sustainable management in SMEs helps both business and communities to grow, develop and sustain their social and economic environment



Management profile. Therefore, SMEs in general should consider integrating these three pillars to the management for them to grow, expand and succeed as it is an inter-related cycle (Fig. 3).

- Also, the model that has been done to help interior design SMEs in the Kingdom of Bahrain can also be adjusted and implemented in other organizations and not only in interior design by simply following the simple steps and executing it (Fig. 4).

To conclude, the execution of such model will become a success if all members of a business work towards implementing it because what can be concluded is that the companies in the selected sample lacked communication in terms of rules and regulation and discussions in meetings between top managers and employees to implement sustainable management. As for the recommendations, it can be stated that

- For better results of the proposed model, it is recommended that a Board for SMEs support is created with the aim of promoting the growth and continuity plans of SMEs regarding sustainable management. The board is derived from the MOIC. It starts with collecting data and investigating the situation of SMEs, follow-up visits, and measuring progress concluding all with a review report of integrating such model.

- Furthermore, approaching design societies will also be a highly evitable factor since these societies would have access to firms that would be interested in enhancing and growing their businesses. These societies include Bahrain Society for Engineers and Commercial Chamber, which interior design firms are involved in. They can plan with interior design firms in implementing sustainable management and thoroughly assessing the status of sustainable management in each firm.

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The Way to Impartial Justice: Carving an Approach to Effective Decision Making Process, the Role of Individual Judges and Problems Faced by the International Court of Justice

Adit Sharma[✉] and Rajshree Acharya[✉]

Abstract

International Law has been dynamic in nature throughout the last half of the century. With the advent of the United Nations, the International decision making process has been completely revamped. To ensure the legitimacy and effectiveness of this decision making process, the International Court of Justice came into existence as an impartial, justifiable and equitable authority. Even though the International Court of Justice has been fundamental in establishing compliance with substantive rule of law and international legal standards, the perceived biasness and lack of appropriateness has been questioned several times in the academic circles. This antipathy stems from the fact that the International Court of Justice does not exist in ignorance of the individual decision makers who give the shape to the systematic setup of the court. It has been well accepted notion that the institutional legitimacy of the judiciary still depends on the quality of the judgments that judges make (Keeton 1999). These judgments are a concomitant of the behavioral patterns and attitudinal characters of the individual elements of the process. Such attributes give rise to the most debatable proposition of the modern judicial process, the 'Independence of the Judiciary'. Could this freedom be the answer to 'Effective Justice' on an International scale? This research has raised some aspersions and doubts over this far reaching argument. Judges as individual decisions makers are marred and limited by their cognitive abilities. Prior research work has shown strong evidence that judges have a tendency to show natural inclination towards states which are economically and strategically strong within their regional territories and diplomatically strong in International forums (Posner et al. 2005). This paper

concord with the available empirical data and statistical framework to this effect but tries to answer the distortions in the decision making process by utilizing an approach suitable to the psychological analysis and legal ramifications.

Keywords

International court of justice • Judges • Decision • Justice

1 Introduction

The International Court of Justice (ICJ) is the supreme judicial authority that has been established for the aim of world peace, being the part of the UN (United Nations) and being the only such court in the world, situated in Hague. The ICJ works as the main organ for settling the disputes around the globe for mainly the members of the United Nations. Out of these six the International Court of Justice and Security Council, tasked with the maintenance of international peace and security. The Security Council has its primary responsibility to maintain peace and security. But even this court of world is also facing a lot of issues like jurisdiction, non-binding rules and applicability of International Law and sanctions [1]. Now the problem of jurisdiction arises when the non-member states come before the court. Another main problem is the biasness and political influence over the Judges that can be easily seen through a plethora of cases decided by ICJ. Prominent cases like Nicaragua v. United States [2] and Croatia-Serbia genocide [3] case are a few famous cases where we can see that many of the states have denied conceding its judgment and the jurisdiction of the ICJ has been under questioning radar. Many more maritime cases as well as land dispute cases amongst countries has questioned importance and sanctity of the ICJ. The court is not in a much stronger position in terms of general public opinion reason being that most of the

A. Sharma (✉) · R. Acharya
National Law University and Judicial Academy, Guwahati,
Assam, India
e-mail: adit.sharma002@gmail.com

R. Acharya
e-mail: rajshree@nluassam.ac.in

judgments pronounced by the panel is either politically motivated or show lack of independence of judges [4]. Despite this, the ICJ “plays the leading role in legitimizing the system by resolving its disputes in a principled manner” [5]. According to the critics of the ICJ’s who are the politicians from different states as well as the diplomats who all have lost their cases argue that the judgments rolled out by the ICJ are most of the time inclined towards the political motivation. The description of the ICJ as ‘semi-legal, semi-judicial, semi-political body which nations sometimes accept and sometimes don’t’ [6]. It can also be said that the ICJ is a replica of the other domestic courts as the voting in these domestic courts and that in ICJ is same and both of them shows the influential decisions of the judge which would reflect the ideology and the disinterested application of the legal reasoning. We thus begin the paper considering the null hypothesis being that the judge’s votes are unbiased and unfiltered.

The opening of the paper deals with the aspects because of which the judgments in an international court are ripening into mala-fide nature. This paper’s main agenda remains to seek the way to impartial justice and where the author is carving an approach to effective decision-making in ICJ.

- Firstly describing the formation and the need of ICJ and it’s history, wherein after the leading aspects that leads to tumbling of the judgments.
- After the aspects, this paper throws light on some adversities faced by Judges and once the reader has been exposed to general challenges faced by Judges and how they are affected by it; the author will return to the approach for impartial justice by judges of ICJ and lastly with the conclusion.

2 Leveraging Aspects

It is not the most prolific International Court and is a successor of the Permanent Court Of The International Justice, (Herein after referred as PCIJ). The Permanent Court Of The International Justice, which was structured to cut down the disputes arising between nations was in its zenith in the mid 1920s and the beginning of the 1930s and ruled out judgments for the contentious cases (legal disputes between parties before the court). With the advent of the great depression and the rise of the Nazism the people started to compress it’s importance and relevance because right after the outbreak of war there were no elections held for PCIJ, which led to the fall of PCIJ. Soon after the fall of PCIJ many countries thought that even under the stress of war a future thought should be given to International court as well as to the creation of a new international court [7].

Thus UN had to back the system to make it resurrect once again. They knew that backing by the UN would make PCIJ work after the World War. Thus emerged the International Court of Justice, getting the new name and backed by UN with all hopes bundled. The International Court Of Justice is brought about cases such as the contentious cases and the border dispute cases also the cases in which there is a contract of special agreement between the two countries, the jurisdiction of the ICJ also depends upon the depth and the conditions of a case. Now, if we talk about the leveraging aspects there can be several branches according to which a decision can be influenced. Firstly, the voting process of the Judges of the ICJ this voting process, which has to be in accordance with the rules laid down by the Security Council and provisional rules laid down by the General Assembly, and also keeping in consonance with the statute of the ICJ elect the judges of ICJ. All States parties to the Statute of the Court have the right to propose candidates [8]. The process of electing is a voting process by which there is casting of the votes in a secret ballot.

Now if we critically analyze the voting procedure we see that the election process is one of the strong reasons, which pulls us towards the biasness of the court. It can be said that according to the rules and provisions casting a vote in the ballot does the voting process. According to our contention, the process is kept ‘secret’, as the ICJ is a public figure court, nothing shall deem the process to be kept as secret. It is non-objectionable to an extent where there is casting of a vote, but the process of declaring the votes should be done publically. The votes from the ballot should be opened and every single vote should be declared in front of the people. This would bring transparency in the election process. Who would believe that the vote casted has been dropped to the person it was meant to be for. Therefore manipulations can be done in declaring the elected judges. This is thus a main leveraging aspect in the biasness of the court. The corollary is that the judges so elected in a biased manner give the judgments in the favor of those who helped them get elected.

Although these are mere assumptions and the loopholes found the election process and no evidences are found to prove them. These are mere assumptions and not proven facts. Secondly when we talk about the Psychological aspects of the judges the human tendency to favor their own country lies somewhere deep within the mind of the judges, therefore if by any chance the Judge knows that it’s their country it is very difficult yet rare to see a judgment going against that country and the judge imposing sanctions to their own country, the question then arises is that If there is a human tendency to favor their own nation then why judges are sometimes made to judge the cases of their own country thus violating the principles of natural justice. Judges of the ICJ have an experience of legal advisor as well as other high

authoritative posts such as diplomats, politicians, administrator and other governmental positions.

Therefore they have many connections in the outside world [9]. They are the creamy layer and also the influencers; there of the psychological thinking and the human tendencies affect the judgments. The Judges also tend to favor those states to which their own native states have ties this leads to a very biased judgment. The human behavior cannot be changed and bended to a type where it will not be biased but a situation can be created in which these tendencies are not tested. There in the court, there are just a countable number of slots and many states, that is, 15 slots for about 193 states, which is an irrational ratio of seats per states. The allotment of these empty slots is pre-decided by the court and the permanent members always have their slot reserved [10]. This therefore has a biasing effect on the court as superpowers (countries like United Kingdom, United States, France, and Russia [11]) always have their one judge seated in the International Court Of Justice.

But when it comes to smaller nations like Bulgaria, Finland, Austria and Turkey, never had representation in the ICJ, which brings us to a question that does the word 'COURT' where people go out for justice and equality needs representation from the states just to lure the judgment in their favor? The answer lies within the decisions made by the judges and their biasness towards their own native states. There can be multitudinous number of reasons as to why the judges have that much of inflicting reasons. Such as they may seek to uplift their position in the future, the maximizations of profit for their own pocket, the fulfillment of their political status or goals, whereas ideally they should be very sincere to their job and should perform their duties with moral obligations. Thirdly the mainstream thread would be the integral National Identity. This National Identity makes the judgments biased in some ways like the economical aspect, political aspect as well as the selection type biasness.

When the talk is about the economic aspects, not sneering the respect of the Judges but usually the judges tend to fuel their economic interests. The government nominates a judge, a judge who can be manipulated and can be termed to do their jobs successfully [12]. Therefore the null hypothesis comes to a negative argument as the court for the International Justice is biased in a way that they favor their own native states. In a situation where both the Judges of a panel sit in a cases in which their own natives sit down for the judgment then there might arise a possibility that they both will favor their own states and their votes are automatically cancelled out. There are some instances, which make the biasness of the judges very conspicuous. The voting process (As described in the first point), which plays a major role in the decisions making by the ICJ is divided regionally thus corroborating the fact that the decisions of ICJ are not based

on the principle of justice and that there are many factors which influence the judgments [13].

As we all know wealth attracts wealth, thus it is pre-assumed as well as proved that judges often support the nations who are strong by economy. Thus this formation of countries that are wealthier makes a serious problem as they overpower other poorer countries. Therefore these are some aspects by which the ICJ judges bigotry judgments. Now if these are the aspects according to which the judges work, it will have certain amount of repercussions. The most far-reaching repercussions would be in the implementation of Judgments. Judgments are the most crucial part of the court, and should be ethically right. Whereby, if judgments are one sided and biased it will fumble the authenticity of the court. As a result of which the court will have several problems in asking the nation states to comply with it's decisions. We can legally back our arguments by some famous cases decided by ICJ.

3 Compliance of Judgments

One of the obstacle faced by judges is the enforcement of decisions of the International Court of Justice which may involve problems that touch upon some of the most sensitive areas of both public international law, and the law of the United Nations, at a time when these two systems of law can hardly be considered as totally separate from each other. Major reason for these partial judgments is the composition of ICJ (as discussed above), which leads to injustice. The rule of self help remains prominent in the body of general law and on the other hand, within the apparently more institutionalized context of the UN system one is often confronted with highly controversial issues, such as voting procedure in the Security Council, or the relationship between the Council and the International Court of Justice, these issues being part and parcel of the everlasting controversy between law and politics. The major reason behind lack of implementation of judgments is article 94(2) [13] of the charter act which vests the security council with the power to give effect to a judgment of the ICJ and it gives a potential element of solidarity between the two UN organs. The United Nations Charter, Article 94(1) [14], places the obligation of member states: "Each member of the United Nations undertakes to comply with the decisions of the International Court in any case to which it is a party".

This provision appears in the Charter, but not in the Statute of the ICJ, highlighting a weakness in the compulsory jurisdiction of the Court that has been disobeyed by some states. Under the framework of the Charter, responsibility for ensuring compliance is not within the ICJ's mandate, but with the principal political organ (Security Council)

for maintaining peace and security. If any party to a case fails to perform the obligations incumbent upon it under a judgment rendered by the Court, the other party may have recourse to the Security Council, which may, if it deems necessary, make recommendations or decide upon measures to be taken to give effect to the judgment. It seems therefore that after a judgment has been issued, compliance with that judgment becomes a political rather than a legal issue. Most of the times parties fail to comply with the judgment given by courts. Most of the time balance appears to be in favor of Security Council limiting the power of ICJ [15]. For instances we can see in the case of Nicaragua V. United States [2] and various others, the author has analyzed judgment and found out the intricacies such as implementation of the judgment and biasness of the court.

3.1 Nicaragua Case

Nicaragua a place in central America initiated a proceeding against the United States of America for conducting Military and paramilitary activities in and against Nicaragua. The court required U.S. to immediately stop their access to Nicaraguan ports, and, in particular, the laying of mine. It said that Nicaraguan like other states should be respected and no intervention should be done in matters within the domestic jurisdiction of the state. Just before the closure of the case, El Salvador requested permission to claim that the court had no jurisdiction to entertain this case. After hearing an argument from both the parties, on 26th November 1984 court delivered a judgment, which said that it possessed jurisdiction to deal with the case. The subsequent Proceedings took place *ex parte* as U.S. on 18th January 1985 announced that it did not intend to participate in any proceeding with regard to this case. After taking into consideration the finding against united states the court delivered its judgment saying that the United States has violated the obligations imposed by customary international law not to intervene in the affairs of other states and not to interrupt peaceful maritime commerce U.S. had also violated certain obligations arising from a bilateral treaty of friendship and Commerce and Navigation Act of 1956. The Court ruled that U.S. was under a duty to refrain from all the acts constituting breaches of its legal obligations and must make reparation for all injuries caused to Nicaragua.

The court by an order, time limits for the filing of written pleadings by the parties. On 29th March 1988, Nicaragua filed its Memorial while U.S. maintained its refusal to take part in proceedings. In September 1991, Nicaragua Informed the court, *inter alia*, that it did not wish to continue the proceedings and, by an order of the president dated 26th September 1991, the case was removed from the court's list. Hence we can see how due to united states multilateral treaty

reservation, the court could not use charter of United nations and was goaded to base its finding in relation to the use of force customary and general principles of international law [16]. How due to united states multilateral treaty reservation, court could not use Charter of United Nations and was goaded to base its finding in relation to the use of power customary and general principles of international law [17]. When the judgments of the ICJ are not dealt with seriousness and lacking of authoritative decisions, the nation states then abruptly stop complying with the decisions and as a result of which the states stops considering the jurisdiction of the ICJ on itself. Thus with every biased decision the ICJ is digging the land below itself. These judgments have an intercontinental effect and the states fail to accept the courts decision as well as jurisdiction, which can also be seen in a recent case of South China Sea Dispute [18].

3.2 South China Sea Dispute

South China Sea dispute is a maritime and island dispute case which started off among several sovereign states within the region, namely Brunei, the People's Republic of China (PRC), the Republic of China (ROC), Malaysia, Indonesia, the Philippines, and Vietnam. Approximately 3.5 million square km area of the South China Sea has been under dispute as China, the Philippines, Vietnam, Malaysia, Taiwan and Brunei have all claimed sovereignty over this territory. This area of the sea is rich in oil and gas fields. China has backed its territorial claim by building on these islands and running naval patrols near them. While the US says it is not taking any side in the argument, it has sent military ships and planes to the area, which has irked China. Both China and the US have accused each other of "militarizing" the South China Sea. China claims the water, saying the area is within its "nine-dash line", which extends hundreds of miles to the south and east of its island province of Hainan. Nine-dash lines are the dashes that demarcate virtually all of the South China Sea as Chinese territory, under the United Nation Convention on the Law of the Seas, or UNCLOS.

China has been taking what analysts say are "passive-aggressive" steps, which is to use fishing vessels and oil rigs to change the status quo on the ground and assert sovereignty over the area. China has reiterated time and again that it has had rights to the territories for centuries, a claim that is contested by Vietnam and Taiwan. Held- Judges at an arbitration tribunal in The Hague on Tuesday rejected China's claims to economic rights across large swathes of the South China Sea in a ruling that will be claimed as a victory by the Philippines. How is it related? Clearly the case has been decided in favor of Philippines and thus the losing end China. China on the other hand rejects the order and is no compliance with the judgments weakens

the compelling power of the court. Thus these cases together bundled makes a strong criticism on the compelling powers of the decisions of the International Court of Justice.

4 Jurisdiction in Question

Another major challenge faced by the ICJ is the issue of the court's compulsory Jurisdiction. The International court of justice has jurisdiction in two types of cases: Contentious issues between states in which the court gives binding rulings between states that agree, or have previously agreed, to submit to the ruling of the court; and advisory opinions, which provide reasoned but non binding, rulings on properly submitted questions of international law usually at the request of the United Nations. Advisory opinions do not have to concern particular controversies between states, though they often do. Article 36(5) provides for jurisdiction on the basis of declaration made under the permanent court of international justice' statute. Article 37 of the ICJ's statute similarly transfers jurisdiction under any compromiser clause in a treaty that gave jurisdiction to the PCIJ. Many Commentators, including even some members of the international court of justice itself, have expressed concerns about the court's ability to make a valid contribution to the resolution of peace and settlement. Such criticism is based on the obvious problems of the international legal system: its basis of consensual jurisdiction and the reluctance, and at times the resistance, of states to comply with the Court's decisions. The ICJ mediates between two states when one of them infringes the terms in a treaty. The states that are subjected to the 'compulsory Jurisdiction' by which they fall within the ambit of the ICJ.

A total of 66 states have accepted the Compulsory Jurisdiction as stated in Article 36(2) of the statute that a state party can declare anytime to accept the compulsory jurisdictions of the court in matters of conventions or matters relating to the International Law [19]. These states can bring the cases to the court. ICJ has tethered reputation when it comes to jurisdiction as many states have denied the proposition of jurisdiction by ICJ on them. Ongoing treaties also bring the states in a deadlock, which also falls within the jurisdiction of the ICJ. Talking about the sanctions put by the ICJ, it is sometimes accepted and sometimes-rejected. The courts advisory jurisdiction does not enjoy a similar authority to that of other principal organs. There is limited use of the advisory jurisdiction by the organs and agencies of the UN maybe because of the lengthy procedure of court and also there is no permanent chamber for advisory jurisdiction. Another major point of court's contentious jurisdiction is that despite there being more than 300 treaties that stipulate in the event of a dispute between the signatories in relation to the application or interpretation of the treaty the matter

shall be referred to ICJ, a considerable number of such treaties do not include provisions for settling disputes through compulsory jurisdiction. For example The Geneva convention on the law of the sea,1958 and the law of the sea Convention, 1982 [20].

4.1 Establishment of Jurisdiction Over Non-Member States and Other Organizations

International court of Justice is often called as 'court of United Nations', which means that only member states are eligible to appear before court and at present only 192 members of United nations can submit the cases. Various International organizations, private enterprises and individuals cannot have their cases taken to the international court [21]. Even UN agencies cannot bring up a case except in advisory opinions, which too is non-binding. Even in the case of member countries the court cannot have the automatic jurisdiction over the states, but it is the state or states, which bring their matter before the court. Eventually leaving the jurisdiction at the complete discretion of states (Criticism given by Kelsen). Since it is not even closer to the ideal of compulsory jurisdiction it is not only a conceptual problem but has important practical implications. Though some of the states like Russia never submitted to the ICJ's Jurisdiction or at least not beyond a single case. On the other hand other few states are also withdrawing their declaration of recognition of court's jurisdiction [22].

Hence the ICJ is far from being a genuine "World Court" as it is sometimes referred to because other than member states no other state can knock the door of the court for justice. In the world of globalization it is not necessary that all the cases be related to states they can be related to various international organizations or enterprises and other social and political body and may want to approach the court but cannot do so. Establishment of jurisdiction over non-member states and other organizations as well should be made a pivotal point and should be taken as a constructive criticism. When the jurisdiction is in question we take in account of the landmark case of Corfu channel case stated that the general principles of international law have been recognized and applied in international disputes. The facts of the case are on 22nd October 1946, two British destroyers were passing through Corfu strait and struck mines in Albanian waters and suffered damages.

Soon after this, the government of U.K. filed an application against Albania claiming that the Albanian Government was internationally responsible for this incident and must make reparation for the same. On the other hand, Albania had submitted a counter claim against U.K. for violating the Sovereignty of Albanian territorial waters.

Though Albania had sufficient amount of proof with respect to U.K.'s Activity in Albania and taking into consideration the fact that U.K. was an unfair victim the International Court of Justice found that Albania was responsible for loss of machinery and human [23] life, even though the United Kingdom had violated the sovereignty of Albania. Compensation was hence ordered.

Though Albania expressed regret for the incident but not blaming the coastal command said that it was never the purpose of our coastal command to attack ships, if they had been recognized and if they had not been in our territorial waters. But Great Britain said that it is immaterial whether the straits consist of territorial water, assurances should be given that there would be no further interference in the right of navigation through the Corfu channel. This incident falls prey to political climate of the time. Albania had hurt the prestige of the British government and thought it to be an infringement on the unlimited freedom that the U.K. traditionally enjoyed as "mistress of the sea" and all the more, a small country like Albania did this. Therefore the judgments are to be highly influenced by the country having a permanent seat at the General Assembly, that is United Kingdom [23].

4.2 Nottebohn Case [23] (Liechtenstein V. Guatemala)

In this particular case, after the initiation of the World War II, A man Nottebohn was a German citizen who lived there for about 34 years and then applied for Liechtenstein's citizenship. He had no such relation to Liechtenstein and was intending to live in the same German city Guatemala. The application was advanced and was approved by the Liechtenstein with a three-year acceptance. He went to Liechtenstein and after some period of time returned back to his hometown i.e. Guatemala. In Germany his entrance was denied on the fact that he was assumed to be the citizen of the Liechtenstein. Therefore as a result of which Liechtenstein filed a suit before the International Court of Justice to compel Guatemala to accept Nottebohn's contention of him being the national of Germany.

Issue: *Must nationality be disregarded by other states where it is clear that it was a mere device since the nationality conferred on a party is normally the concerns of that nation?*

The ICJ ruled out that cases relating to citizenship are the only concern of the granting nation and that is the basic rule. But that does not go out to force the other states to accept the conferring state's designation until and unless some person has ties with both the nations.

How is it related? The ICJ's decision was out of the jurisdiction of the states. If else the ICJ imposed Guatemala to recognize Nottebohn as its citizen, it was only up to Guatemala to approve of this or not. Therefore, this makes a strong question on the jurisdiction of the ICJ. The compliance of the judgments of the ICJ has made the jurisdiction in question. In this particular case the jurisdiction as to how far the ICJ can adjudicate is questioned. And thus the jurisdiction is one point where ICJ lacks behind.

5 The Way to Impartial Justice: Carving an Approach to Effective Decision-Making Process

As we have been discussing throughout the paper, how the role of individual judges and their behavioral attitudes affect the justice and leads to impartial justice. In this section of paper the author is trying to carve an approach to effective decision making process by first discussing various challenges faced by Individual judges and what are the role of judges in making decision and then the author is suggesting different ways through which independence and effective decision making of a judge can be used as a way to impartial justice in the international law.

5.1 Role of Judges

Judges are impartial decision makers. When it comes to role played by the judges of International Court of Justice they are supposed to adopt adversarial system. In fact the ICJ's tendency over time is to operate in a manner, which is much close to common law court then to a civil law court [24]. The judges should serve as a referee. While deciding a particular case they must be able to exercise their professional responsibilities without being influenced by the executive, legislature or any other in appropriate sources. Public must have full confidence in the ability of judiciary to carry out its function and whenever this confidence begins to be eroded, neither the judiciary nor the individual judges will be able to fully perform this important task. Judges cannot act arbitrarily in any way by deciding cases according to their own personal preferences [1]. Because people often wonder what rules of law and principles are applied by a court of fifteen judges from as many different legal systems in the adjudication of disputes brought before it therefore Judges of ICJ should always abide by Article 38 of U.N. charter. Which states "Without prejudice to the provisions of Articles 33 to 37, the Security Council may, if all the parties to any dispute

so request, make recommendations to the parties with a view to a pacific settlement of the dispute”.

5.2 Challenges Faced by Judges

There are various obstacles faced by ICJ in bringing justice. One of the major reasons is the challenge faced by judges [25]. Prominent among all is the procedure in which the judges are appointed.

5.3 Appointment of Judges

The appointment of judges is conducted through voting process, which happens through a secret ballot. Many member countries take part in that voting process and since the appointment and reelection of judges are in the hands of axis powers that are the permanent members it becomes nearly impossible for the judges to rule against these axis powers thus compromising the impartiality of the court. These judges tend to vote in favor of axis power. There have been many instances where the voting pattern of the panel has showed the clear biasedness on the part of the judges. As happened in the case of **Medellin v. Texas** [26] and in the case concerning United States diplomatic and consular staff in Tehran. The Biasedness and sanctity of the jurisdiction of ICJ can be very well seen in these two cases wherein *Medellin v. Texas* U.S. Supreme Court denied the decision given by ICJ and held that even if an international treaty may constitute an international commitment. It is not binding on domestic laws unless Congress has enacted a status implementing it or unless the treaty itself is self-executor. The Court did not take any action or imposed a legal sanction against U.S. despite the fact that U.S. had failed to comply with the decision given by the court. Whereas in the case concerning United States diplomatic and consular staff the court unanimously held that Iran should ensure the restoration of the U.S. embassy in Tehran to U.S. possession as afforded by international law, without addressing the actual merits of Iran’s action though Iran took no part in the proceedings.

5.4 Other Challenges

Conflict of interest by the presence of permanent members of U.N. in the court [27]. This not only creates inappropriate outside pressure on the judges but also results in biased decisions. Independence of judges is frequently threatened by the refusal of the executive to allow them to organize freely their work and they cannot carry out their work independently.

5.5 Carving an Approach to Decision Making

The supreme court of Canada described the concept of judicial impartiality as referring to “a state of mind or attitude of tribunal in relation to the issues and parties in a particular case. Same view has also been confirmed at the international level [1]. Human rights Committee has held that notion of impartiality implies that judges must not harbor preconceptions about the matter put before them. They shall not act in a way that promotes the interest of one of the parties. To have an unbiased and effective decision making it is very important for the judges to realize and work according to their role and to find out a way to handle all the challenges faced by them. Independence of judiciary is must. International law does not provide in details as to how this institutional independence is to be realized in practice. It is clear that the judiciary must be able to handle its own matters and there should be independence of judiciary in administrative matters, financial matters and in decision-making. Another way to impartial justice is effective implementation of decisions. All the member states and all the parties related to case must respect and abide by the judgments and decisions of judiciary even when they do not agree with them. There shall be not be any interference with judicial process, nor shall judicial decisions by the court be subject to revision to another organs of U.N. Independent decision making power of the judiciary also comprises of jurisdictional competence i.e. exclusive authority to decide whether an issue submitted is in within its competence as defined by law. The judges should be given security in terms of financial security and security of tenure. If the parties fail to recognize the judgment then proper sanctions could be applied [1].

6 Conclusion

Judges are humans and biasness breeds within their psyche. For long, the ICJ has been considered to be at the forefront in the blossoming of International Relations, which is an antithesis to the data, which stoutly suggest that most of the decisions of the humble court are complied with. In such predicament, irrespective of the fact that there are a lot of hurdles in the way of partial justice, Judges should be the torchbearer though the counter thought prevails, as Judges are predominately inclined towards political considerations and financial flexibilities of their home state. Obverse to the hypothesis built around this research work and the aim of this research paper there are no clear suggestive attributes, which can vindicate the premise that Judicial Bias exist in the legal dimensions of the ICJ and Judges must be abstained from voting in issues involving their home states or their allies. The paper extends its focus on the carving of an

approach for a better, unbiased decision-making process by the ICJ. The result proved is contradictory to the null hypothesis and the paper clearly does not states that the judges are biased but they don't vote impartially. It is partial as the judges vote either because of the personal motives or by natural human tendencies or by voting in favor of the country that is similar to their own country. If a judge tries to provide equal justice, his vote is cut out by other majority of votes by the judges, as a result of which the ICJ is in continuous war with itself as well as the world. The other result reached is that ICJ is a weak dysfunctional institution. The judgments being biased makes the ICJ a corrupt institution whose jurisdiction becomes a question for the non-member states. The public at large as well as the critics have a valid point as to 'Why the Judges are made to judge their own country's case?' keeping in mind the basic human tendencies and the human sociological behavioral aspects. Keeping in mind that the judgments delivered by the judges of ICJ are politically motivated and biased, it does not hold a much stronger position in terms of general public opinion. After discussing the general challenges faced by the judges and how they are affected by it; the author has tried to carve an approach towards impartial justice by highlighting the role of judges and ways through which they can abstain all the pressure and hurdles which come in their way to deliver unbiased decision.

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