

Eurasian Studies in Business and Economics 12/1

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Giray Gözgor *Editors*

Eurasian Economic Perspectives

Proceedings of the 25th Eurasia
Business and Economics Society
Conference



 Springer

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Series Editors

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and Economics Society Conference

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Preface

This is the Volume 1—**Eurasian Economic Perspectives**—of the 12th issue of the Springer’s series *Eurasian Studies in Business and Economics*, which is the official book series of the **Eurasia Business and Economics Society** (EBES, www.ebesweb.org). This issue includes selected papers presented at the 25th EBES Conference—Berlin that was held on **May 23–25, 2018**, with *the GLO (the Global Labor Organization)* at the *FOM University of Applied Sciences* in Berlin, Germany, with the support of the *Istanbul Economic Research Association*.

Distinguished colleagues **Klaus F. Zimmermann** from *UNU-MERIT*, the Netherlands, **Marco Vivarelli** from *Universita Cattolica del Sacro Cuore in Milano*, Italy, **Sascha Frohwerk** from *the FOM University of Applied Sciences in Berlin*, Germany, and **Ahmet Faruk Aysan** from *Istanbul Sehir University*, Turkey, joined the conference as keynote speakers.

During the conference, participants had many productive discussions and exchanges that contributed to the success of the conference where 316 papers by 525 colleagues from 60 countries were presented. In addition to publication opportunities in EBES journals (*Eurasian Business Review* and *Eurasian Economic Review*, which are also published by Springer), conference participants were given the opportunity to submit their full papers for this issue.

Theoretical and empirical papers in the series cover diverse areas of business, economics, and finance from many different countries, providing a valuable opportunity to researchers, professionals, and students to catch up with the most recent studies in a diverse set of fields across many countries and regions.

The aim of the EBES conferences is to bring together scientists from business, finance, and economics fields, attract original research papers, and provide them with publication opportunities. Each issue of *the Eurasian Studies in Business and Economics* covers a wide variety of topics from business and economics and provides empirical results from many different countries and regions that are less investigated in the existing literature. All accepted papers for the issue went through peer-review process and benefited from the comments made during the conference

as well. The current issue covers fields such as regional studies, macro-economics, investment and risk management, economics of innovation, and law and regulation.

Although the papers in this issue may provide empirical results for a specific county or regions, we believe that the readers would have an opportunity to catch up with the most recent studies in a diverse set of fields across many countries and regions and empirical support for the existing literature. In addition, the findings from these papers could be valid for similar economies or regions.

On behalf of the series editors, volume editors, and EBES officers, I would like to thank all presenters, participants, board members, and the keynote speakers, and we are looking forward to seeing you at the upcoming EBES conferences.

Best regards

Istanbul, Turkey

Gökhan Karabulut

Eurasia Business and Economics Society (EBES)

EBES is a scholarly association for scholars involved in the practice and study of economics, finance, and business worldwide. EBES was founded in 2008 with the purpose of not only promoting academic research in the field of business and economics but also encouraging the intellectual development of scholars. In spite of the term “Eurasia,” the scope should be understood in its broadest terms as having a global emphasis.

EBES aims to bring worldwide researchers and professionals together through organizing conferences and publishing academic journals and increase economics, finance, and business knowledge through academic discussions. Any scholar or professional interested in economics, finance, and business is welcome to attend EBES conferences. Since our first conference in 2009, around 11,157 colleagues from 98 countries have joined our conferences and 6379 academic papers have been presented. *EBES has reached 2050 members from 84 countries.*

Since 2011, EBES has been publishing two journals. One of those journals, *Eurasian Business Review—EABR*, is in the fields of industrial organization, innovation, and management science, and the other one, *Eurasian Economic Review—EAER*, is in the fields of applied macroeconomics and finance. Both journals are published quarterly by *Springer* and indexed in *Scopus*. In addition, EAER is indexed in the *Emerging Sources Citation Index (Clarivate Analytics)*, and EABR is indexed in the *Social Science Citation Index (SSCI)*.

Furthermore, since 2014 Springer has started to publish a new conference proceedings series (*Eurasian Studies in Business and Economics*) which includes selected papers from the EBES conferences. The 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, and 20th (Vol. 2) EBES Conference Proceedings have already been accepted for inclusion in the *Conference Proceedings Citation Index—Social Science & Humanities (CPCI-SSH)*. The 20th (Vol. 1), 21st, and subsequent conference proceedings are in progress.

We look forward to seeing you at our forthcoming conferences. We very much welcome your comments and suggestions in order to improve our future events. Our success is only possible with your valuable feedback and support!

I hope you enjoy the conference and Berlin.

With my very best wishes,

Klaus F. Zimmermann
President

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Part I
Regional Studies

Residential Real Estate in the Municipalities Located in the Naturally Valuable Areas in Poland



Alina Kulczyk-Dynowska  and Katarzyna Przybyła 

Abstract This chapter presents the selected aspects of residential real estate resources in 117 municipalities linked with Polish national parks. The necessity of meeting the living needs makes this type of real estate particularly important. As a result of interactions occurring between the residential real estate and its socio-economic environment, the selected features characterizing demography and the tourist function of the explored municipalities were discussed. The selection of territorial units was based on the criterion of establishing a national park in the area of a municipality. The research period covers the years 2005–2015. The purpose of this chapter is to attract attention to the situation of local communities residing in the areas covered by the highest rank of area forms of nature protection.

Keywords Real estate · National parks · Local development

1 Introduction

Covering the area with legal protection changes the rules of spatial management—this factor restricts economic activity. As a result, nature protection in national parks exerts not only spatial, but also economic impacts (Kulczyk-Dynowska 2014, 2015; Przybyła and Kulczyk-Dynowska 2017). Based on these restrictions certain allegations are put forward regarding spatial forms of nature conservation having a negative impact on local development, and thus on life quality of the local community (Wells and Brandon 1992; Mayer 2014; Bennett and Dearden 2014; Potocki et al. 2014). The counterarguments, however, emphasize that these areas do not actually restrict economic activity, but rather channel it—by supporting the development of tourism or organic farming (Marković et al. 2015; Mose 2016; Schott et al. 2016; Stokke and Haukeland 2017). In this context, it is highlighted that

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protected areas guarantee the beauty of landscape, ensure responsible spatial management, high quality of the environment and facilitate maintaining regional cultural identity (Krajewski 2017; Pluciennik et al. 2016; Szewrański et al. 2017).

National parks represent the widely known forms of nature conservation. They are covered by the highest rank of protection, and the limitations in force, addressed to their areas, are the most restrictive ones among all spatial forms of area conservation. The functioning of 23 Polish national parks is determined by the Nature Conservation Act 2004. (c. 92, item 880). In a global perspective, national parks perform an important role in maintaining biodiversity (Gray et al. 2016). At the same time, from the local perspective, they still remain a component of the municipal functional system (Brooks et al. 2006). It means that the local community and protected areas persist in continuous interaction on many levels—predominantly in terms of spatial management, having impact on, e.g. the development of construction sector (including residential housing) and tourist infrastructure constituting the necessary component of tourist function development in the discussed area.

The purpose of this chapter is to attract attention to the selected aspects of the life of local communities residing in areas covered by the highest rank of spatial nature conservation. The authors are seeking answers to two research questions. Firstly, do the resources of residential housing in the municipalities linked with national parks continue to develop? Secondly, is there any correlation between the tourist function of the analyzed municipalities and the housing function? A complementary problem is a tendency in the population number of local communities in the analyzed municipalities. A research hypothesis was adopted that the proximity of a national park stimulates the housing function. The spatial scope of the conducted research covers 117 municipalities territorially linked with 23 Polish national parks. The research period refers to the years 2005 and 2015. The beginning of the research is also the first full calendar year of Poland's functioning in the European Union structures. The end of the research period is determined by the availability of statistical data.

2 Methodology

The initial research stage consisted in identifying municipalities that are territorially linked with national parks. Adopting this criterion allowed separating 117 territorial units. The first research stage focused on a short analysis of population numbers. In the second stage, the tourist function and the development of residential housing resources (housing function) of the studied municipalities were analyzed. In each case 2005 was adopted as the base year, whereas 2015 as the analyzed year.

The statistical analysis carried out in the second part of the research, using linear ordering methods—synthetic development measures (SDM), requires a detailed description. It allowed constructing rankings of the municipalities in terms of the development level of both analyzed functions, to be followed by a comparative

analysis of municipalities in the studied areas and also correlation assessment between the development level of both the housing function and tourist function.

SDM construction and application are described by, e.g. Hellwig (1968); Strahl (1978); Walesiak (2006); Marti and Reinelt (2011); Kukuła (2012, 2014); Bal-Domańska (2016a); Kukuła and Luty (2017); Manly and Navarro Alberto (2017). Synthetic development measures are primarily recommended as a tool used in comparing local and regional systems, e.g. in terms of economic, social and environmental development—as indicated, among others, by Bal-Domańska (2016b), Malina (2008). Therefore, they can be applied in analyzing both the tourist function and the housing function. The study adopts that the municipalities linked with national parks form one set made up of 117 objects. SDMs for both analyzed aspects were constructed, i.e. for the housing function (SDM_{housing}) and the tourist function (SDM_{tur}). Due to the fact that 14 municipalities did not present tourist facilities subject to official reporting, the set of objects for SDM_{tur} was narrowed down to 103 units.

Based on SDM value the position of each municipality was determined in terms of the development level of the tourist function against the background of the housing function. The following research procedure was adopted:

1. Defining variables (indicators) for each SDM
2. Carrying out unitarization with zero minimum procedure for the entire period simultaneously (2005 and 2015)
3. SDM construction with a weight system in accordance with the method of (standardized) sums with a common development pattern for the years 2005 and 2015
4. Defining the ranking position of municipalities in each of the analyzed years for the particular SDM (SDM_{housing} , SDM_{tur})
5. Comparing the ranking positions of municipalities defined by each SDM (SDM_{housing} and SDM_{tur})
6. Comparing changes in the situation in a municipality over time based on SDM_{housing} and SDM_{tur}
7. Calculating the sequence correlation coefficient between SDM_{housing} and the supplemented SDM_{tur} measure
8. Classification of municipalities according to SDM value (SDM_{housing} and SDM_{tur}) using arithmetic mean and standard deviation

The research procedure was initiated with defining indicators characterizing each of the thematic areas. For the purposes of determining SDM_{housing} ; the number of apartments available for occupation per 1000 residents, area of apartments available for occupation per 1000 residents, average living area per apartment, average living area per resident, and the number of apartments per 1000 residents are the defined as indicators.

All indicators were considered stimulants without a veto threshold, which means that the municipalities achieving high values of the above presented indicators were assessed as the highest ranked units, representing the most favourable situation. The

aforementioned indicators were calculated based on the data collected from the Central Statistical Office.

For SDM_{tur} the following variables were adopted:

1. Baretje and Defert index—assessment of tourism development level (Baretje and Defert 1972)
2. Tourist accommodation density indicator—assessment of tourist accommodation saturation (Menges 1955)
3. Charvat index—assessment of the intensity of tourist traffic (Charvat and Cerny 1960)

These indexes were calculated according to formulas [1] (Kowalczyk 2002), [2] (Warszyńska and Jackowski 1978), and [3] (Lijewski et al. 2008).

$$Tf(t) = \frac{\text{number of beds in the area} \times 100}{\text{number of population in the area}} \quad (1)$$

$$W_{GBN} = \frac{\text{number of beds}}{\text{km}^2 \text{ of the area}} \quad (2)$$

$$T_{Ch} = \frac{\text{number of night accommodations sold} \times 100}{\text{number of local population}} \quad (3)$$

Due to the fact that the Local Data Bank ceased the publication of data on the number of overnight stays at the end of 2014, the values for 2015 were adopted as the arithmetic mean from the period 2012–2014. All indicators were considered equivalent stimulants without a veto threshold, which means that the municipalities achieving high values of the above presented indicators were assessed as the highest ranked units, representing the most favourable situation.

The unitarization of values of the characteristics adopted for the research was carried out according to the following formula:

$$Z_{jit} = \frac{X_{jit} - \min X_{jit}}{\max X_{jit} - \min X_{jit}} \quad (4)$$

where

x —value of the characteristic

j —variable j , where $j = (1, \dots, p)$

i —object (municipality), where $i = (1, \dots, N)$

N for $SDM_{housing} = 117$

N for $SDM_{tur} = 103$

t —time (year), where $t = (2005, 2015)$

It allowed obtaining values within the range [0, 1]. For each SDM all variables adopted for the study were stimulants and thus the need for unifying them (preference function) did not occur. SDM was calculated using the standardized sum

method (Kowalewski 2002). SDM value for the analyzed municipalities was calculated using formula (5):

$$\text{SMR}_{it} = \frac{1}{p} \sum_{j=1}^p z_{ijt} \quad (i = 1, \dots, N) \quad (t = 2005, 2015) \quad (5)$$

where

SDM—value of non-model synthetic measure in an object (municipality) and
 p —number of characteristics

In the final phase, the analyzed municipalities were ranked in terms of the position determined by the analyzed SDM. The strength of correlation between the level of tourist function and housing function performed by the municipalities was analyzed. In order to calculate the discussed correlation, the ranking positions obtained based on SDM_{tur} were supplemented by assigning 14 municipalities, not included in SDM_{tur} , the same 111 ranking position (arithmetic mean of the subsequent positions from the set of the last positions [from 104 to 117]). Thus, equipotent sets of municipalities in terms of both studied measures were obtained. Correlation was calculated using the Spearman's rank correlation coefficient—the following formula was used (Sobczyk 2010):

$$r_s = 1 - \frac{6 \sum_{i=1}^N d_i^2}{N(N^2 - 1)} \quad (6)$$

where

d_{it} —determines differences between ranks (positions) of the corresponding individual SDM_{it} values.

The following scale was used to assess the strength of the correlation between variables (Sobczyk 2010):

- 10.00–0.31—weak dependence
- 10.31–0.61—moderate dependence
- 10.61–1.01—strong dependence

3 Research Results

The analyzed municipalities are significantly diversified in terms of demographics. It should be highlighted that among the municipalities linked with national parks, 11 have the status of urban municipalities, 31 the status of urban–rural municipalities and 75 the status of rural municipalities. In the group of urban municipalities, there

are two cities with county rights, i.e. Jelenia Góra and Świnoujście, and the largest community resides within their borders—87,000 people in 2005 and 81,000 people in 2015 in Jelenia Góra, whereas 41,000 people in both studied years in Świnoujście. In the first year of the study only six municipalities had the population exceeding 20,000 (except for the above mentioned), in the last year of the study this result was recorded in eight municipalities. In 2005, 22 municipalities recorded their population number within the range [10,000–20,000] and in 2015 26 municipalities, respectively. The municipalities populated with 5000–10,000 residents were the dominating ones—in the first year of the analysis their number was 58, whereas in the last year 52. In both analyzed years, the population number did not exceed 5000 residents in 29 municipalities.

The comparison of population figures in the first and last year of the study indicates that the population number was the same in 18 municipalities (the change did not exceed 1% of the value specific for the baseline year). In 54 units an increase was recorded, and in 45 the number of residents declined. Only in two analyzed municipalities the population number went down by above 10% of the specific value for the baseline year. Therefore, it can be concluded that a significant depopulation occurred only sporadically. Much more frequently a significant increase in population number was observed—the population of 15 municipalities went up by above 10% of the value specific for 2005. The situation of municipalities territorially linked with national parks adjacent to Warsaw and Poznań metropolises should be highlighted—their domination in the group of municipalities characterized by the largest increase in population clearly indicates the pressure exerted by these metropolises on the settlement function. The largest increase in the number of residents was recorded in the municipalities of Komorniki and Dopiewo (municipalities linked with Wielkopolska National Park, located in the vicinity of Poznań), where the number of residents has almost doubled. The aforementioned situation is of particular importance in terms of demand for residential housing.

The tourist function of the studied municipalities is highly diverse—as showed by SMD_{tur} values in the range [0.0–0.945] in 2005 and [0.0–0.731] in 2015 (see Table 1). It should be emphasized that 14 out of 117 analyzed municipalities did not show any tourism-related activities in public statistics—according to the indications presented in methodological comments they had zero measure value and 111 position. Having adopted the interpretation of Baretje and Defert index value according to M. Boyer scale, among 103 municipalities presenting tourism related data, tourist activity was practically non-existent in 59 municipalities in the first year of the study and in 63 municipalities in the last year of the study. In these municipalities, the value of the discussed index did not exceed 4 units—very low SMD_{tur} values are the consequence of the above-mentioned fact. The absolute growth of SMD_{tur} value, calculated as the difference between SMD_{tur} value in 2015 (analyzed) and in 2005 (baseline year) shows that in the set of 103 municipalities, 56 recorded an increase in the analyzed measure value, whereas 31 a decrease. No changes were recorded in 16 municipalities. It should be emphasized that the highest absolute growth in the value of the studied measure was recorded by one of the three leaders—the municipality of Karpacz (Karkonosze NP, mountainous area). It is

Table 1 SDM_{it} of the tourist function and housing function covering municipalities territorially linked with national parks—data for 2005 and 2015

Name of the municipality	Housing function				Tourist function			
	2005		2015		2005		2015	
	SDM	<i>P</i>	SDM	<i>P</i>	SDM	<i>P</i>	SDM	<i>P</i>
Adamów (2)	0.143	76	0.185	80	0	111	0	111
Bargłów Kościelny (2)	0.102	108	0.155	104	0	111	0	111
Białowieża (2)	0.247	24	0.368	22	0.069	11	0.117	11
Bieliny (2)	0.119	95	0.163	95	0.000	91	0.001	89
Bierzwnik (2)	0.112	99	0.167	91	0	111	0	111
Bodzentyn (3)	0.122	90	0.197	73	0.007	50	0.006	53
Brochów (2)	0.209	41	0.178	85	0.000	91	0.000	94
Brusy (3)	0.132	82	0.234	56	0.005	57	0.003	75
Bukowina Tatrzańska (2)	0.228	30	0.267	41	0.034	17	0.118	10
Chojnice (2)	0.169	55	0.268	40	0.031	19	0.023	27
Choroszcz (3)	0.281	17	0.427	14	0.001	79	0.006	55
Cisna (2)	0.230	29	0.497	10	0.135	8	0.125	9
Czarna (2)	0.100	110	0.194	75	0.006	53	0.042	17
Człopa (3)	0.095	112	0.114	116	0.000	91	0.001	86
Czorsztyn (2)	0.224	32	0.276	39	0.022	25	0.030	22
Czosnów (2)	0.348	11	0.436	13	0.002	75	0.002	80
Dąbrowa Białostocka (3)	0.115	97	0.162	96	0.000	89	0.000	92
Dębowiec (2)	0.104	106	0.137	109	0.000	87	0.000	91
Dobiegniew (3)	0.111	100	0.159	98	0.001	84	0.009	42
Dopiewo (2)	0.642	1	0.699	1	0	111	0	111
Drawno (3)	0.096	111	0.128	112	0.004	59	0.005	63
Dukla (3)	0.111	101	0.164	94	0.002	76	0.003	77
Giby (2)	0.259	22	0.328	26	0.019	26	0.033	19
Główczyce (2)	0.046	117	0.080	117	0.000	91	0.001	88
Goniądz (3)	0.175	54	0.249	49	0.009	46	0.010	40
Górno (2)	0.167	58	0.241	53	0.011	43	0.012	38
Górzycza (2)	0.090	114	0.147	107	0.003	64	0.004	69
Grajewo (2)	0.124	88	0.155	102	0.000	91	0.000	99
Hańsk (2)	0.124	89	0.212	66	0	111	0	111
Izabelin (2)	0.465	6	0.544	6	0	111	0	111
Jabłonka (2)	0.236	27	0.288	35	0.002	70	0.004	72
Jaświły (2)	0.187	52	0.224	60	0.000	90	0.000	96
Jedwabne (3)	0.156	67	0.179	84	0.001	83	0.000	101
Jelenia Góra (1)	0.148	69	0.191	76	0.016	30	0.019	31
Jerzmanowice-Przegonia (2)	0.146	72	0.204	68	0.003	67	0.006	54
Józefów (3)	0.119	93	0.181	83	0.003	65	0.005	61
Kamienica (2)	0.105	104	0.188	78	0.008	47	0.003	74
Kampinos (2)	0.207	43	0.263	44	0.000	91	0.002	83
Karpacz (1)	0.391	8	0.549	5	0.441	2	0.682	2
Kobylin-Borzmy (2)	0.244	25	0.321	28	0	111	0	111

(continued)

Table 1 (continued)

Name of the municipality	Housing function				Tourist function			
	2005		2015		2005		2015	
	SDM	<i>P</i>	SDM	<i>P</i>	SDM	<i>P</i>	SDM	<i>P</i>
Komorniki (2)	0.474	5	0.601	4	0.002	71	0.006	56
Kostrzyn nad Odrą (1)	0.145	75	0.151	106	0.004	62	0.007	50
Kościelisko (2)	0.279	18	0.410	16	0.043	14	0.072	15
Kowary (1)	0.101	109	0.123	114	0.014	36	0.008	44
Krasnopol (2)	0.236	26	0.304	31	0.005	56	0.003	78
Krempna (2)	0.131	83	0.128	113	0.013	37	0.006	52
Krościenko nad Dunajcem (2)	0.217	36	0.263	45	0.031	20	0.016	32
Krzyż Wielkopolski (3)	0.110	102	0.155	103	0.000	91	0.001	90
Kudowa-Zdrój (1)	0.142	78	0.168	90	0.062	13	0.135	8
Leoncin (2)	0.257	23	0.323	27	0	111	0	111
Leszno (2)	0.407	7	0.402	20	0.000	91	0.000	100
Lewin Kłodzki (2)	0.167	56	0.205	67	0.011	42	0.025	24
Lipinki (2)	0.133	81	0.166	92	0	111	0	111
Lipnica Wielka (2)	0.162	61	0.223	61	0.001	78	0.000	101
Lipsk (3)	0.119	96	0.196	74	0	111	0	111
Ludwin (2)	0.147	70	0.300	33	0.006	55	0.007	51
Lutowiska (2)	0.082	115	0.174	86	0.067	12	0.108	13
Łapsze Niżne (2)	0.192	49	0.253	47	0.026	23	0.035	18
Łapy (3)	0.129	84	0.181	82	0.001	86	0.000	97
Łączna (2)	0.106	103	0.160	97	0.006	52	0.000	101
Łeba (1)	0.334	12	0.505	9	0.945	1	0.731	1
Łomianki (3)	0.530	3	0.622	3	0.003	69	0.003	79
Masłów (2)	0.207	42	0.304	32	0.016	32	0.020	29
Międzyzdroje (3)	0.505	4	0.515	8	0.325	3	0.313	3
Mosina (3)	0.224	33	0.404	19	0.003	66	0.005	65
Mszana Dolna (2)	0.122	91	0.182	81	0.008	48	0.007	49
Narewka (2)	0.306	16	0.407	17	0.002	72	0.005	58
Niedzwiedź (2)	0.138	79	0.215	63	0.013	38	0.004	66
Nowa Słupia (2)	0.092	113	0.158	99	0.006	54	0.009	41
Nowinka (2)	0.272	20	0.290	34	0.011	44	0.025	25
Nowy Dwór (2)	0.103	107	0.166	93	0	111	0	111
Nowy Targ (2)	0.162	62	0.214	64	0.005	58	0.004	70
Nowy Żmigród (2)	0.124	86	0.135	110	0.000	88	0.001	85
Ochotnica Dolna (2)	0.219	35	0.244	52	0.015	34	0.008	46
Osiek Jasielski (2)	0.146	73	0.140	108	0	111	0	111
Piechowice (1)	0.157	65	0.199	72	0.030	21	0.023	26
Podgórzyn (2)	0.227	31	0.265	43	0.086	9	0.051	16
Poronin (2)	0.264	21	0.331	24	0.017	29	0.083	14

(continued)

Table 1 (continued)

Name of the municipality	Housing function				Tourist function			
	2005		2015		2005		2015	
	SDM	<i>P</i>	SDM	<i>P</i>	SDM	<i>P</i>	SDM	<i>P</i>
Puszczykowo (1)	0.357	10	0.387	21	0.011	40	0.013	37
Radków (3)	0.120	92	0.154	105	0.011	41	0.030	20
Radziłów (2)	0.124	87	0.168	89	0	111	0	111
Rajgród (3)	0.156	66	0.216	62	0.029	22	0.027	23
Sękowa (2)	0.187	51	0.214	65	0.001	82	0.005	60
Skąła (3)	0.210	40	0.276	38	0.003	68	0.003	73
Słońsk (2)	0.162	60	0.235	55	0.001	80	0.005	59
Smóldzino (2)	0.137	80	0.189	77	0.004	60	0.006	57
Sokoły (2)	0.189	50	0.226	58	0.001	85	0.000	95
Sosnowica (2)	0.151	68	0.199	71	0.015	33	0.016	33
Stare Babice (2)	0.557	2	0.678	2	0.000	91	0.004	67
Stary Brus (2)	0.142	77	0.254	46	0.001	77	0.001	84
Stęszew (3)	0.213	38	0.317	29	0.016	31	0.009	43
Suchowola (3)	0.195	47	0.225	59	0.000	91	0.001	87
Sułszowa (2)	0.147	71	0.172	87	0.002	73	0.005	64
Suraż (3)	0.159	63	0.252	48	0.007	51	0.005	62
Suwałki (2)	0.312	15	0.438	12	0.032	18	0.015	36
Szczawnica (3)	0.202	45	0.281	37	0.136	7	0.147	7
Szczytna (3)	0.128	85	0.169	88	0.015	35	0.007	48
Szklarska Poręba (1)	0.213	39	0.454	11	0.248	4	0.206	5
Sztabin (2)	0.145	74	0.187	79	0.000	91	0.000	98
Świnoujście (1)	0.186	53	0.265	42	0.083	10	0.114	12
Trzcienne (2)	0.167	57	0.244	51	0.000	91	0.004	68
Tuczno (3)	0.104	105	0.121	115	0.017	28	0.008	45
Turośń Kościelna (2)	0.374	9	0.411	15	0.000	91	0.000	93
Tykocin (3)	0.196	46	0.239	54	0.004	61	0.008	47
Urszulin (2)	0.207	44	0.337	23	0.007	49	0.002	82
Ustka (2)	0.220	34	0.407	18	0.204	5	0.168	6
Ustrzyki Dolne (3)	0.068	116	0.130	111	0.009	45	0.015	35
Wicko (2)	0.157	64	0.203	69	0.040	16	0.030	21
Wielka Wieś (2)	0.324	14	0.516	7	0.018	27	0.019	30
Wierzbica (2)	0.113	98	0.158	100	0	111	0	111
Witnica (3)	0.119	94	0.157	101	0.003	63	0.003	76
Wizna (2)	0.194	48	0.234	57	0.002	74	0.004	71
Wolin (3)	0.231	28	0.249	50	0.023	24	0.010	39
Zakopane (1)	0.217	37	0.331	25	0.159	6	0.209	4
Zamość (2)	0.278	19	0.310	30	0.001	81	0.002	81

(continued)

Table 1 (continued)

Name of the municipality	Housing function				Tourist function			
	2005		2015		2005		2015	
	SDM	<i>P</i>	SDM	<i>P</i>	SDM	<i>P</i>	SDM	<i>P</i>
Zawoja (2)	0.329	13	0.286	36	0.040	15	0.022	28
Zwierzyniec (3)	0.165	59	0.203	70	0.012	39	0.015	34

Notes:

- (1) Urban municipality, (2) rural municipality, and (3) urban–rural municipality
- SDM—Synthetic development measure value
- *P*—The ranking position based on SDM
- Positions from 1 to 10 are marked in grey and refer to the highest development level of the analyzed phenomenon among the municipalities covered by the research

Source: Author's compilation based on the Central Statistical Office data

also interesting to observe that the leader, i.e. Łeba Municipality (Słowiński PN, coastal area), recorded the highest absolute decline in SMD_{tur} value, however, despite that it did not lose the position held so far. The above observations indicate that the distance separating Łeba from other municipalities remains significant, but in the future it seems realistic that it will lose its ranking position for the benefit of Karpacz. Therefore, it can be anticipated that the municipality linked with the mountainous national park will be more willingly chosen by tourists than the coastal area. In both analyzed years, the dominant position was held by the municipalities located in both coastal and mountainous areas. Among them there were tourist centres recognized not only in Poland, but also abroad. The stability of leaders is crucial here—in both analyzed years, the first three positions were taken by: Łeba, Karpacz, and Międzyzdroje, respectively.

The housing function of the analyzed municipalities is—similarly to the tourism function—highly diverse. $SMD_{housing}$ values presented the range [0.046–0.642] in 2005 and [0.080–0.699] in 2015 (see Table 1). The absolute growth of $SMD_{housing}$ value, calculated as the difference between $SMD_{housing}$ values in 2015 (analyzed) and 2005 (baseline year) shows that in the set covering 117 municipalities as many as 111 recorded an increase of the analyzed value, whereas only 6 a decline. The above indicates that the vast majority of municipalities linked with national parks were characterized by development in terms of their housing function. The highest absolute growth in the analyzed measure value was recorded by Cisna municipality, ranked among the top ten leaders regarding tourist function. It should be emphasized that in the majority of municipalities covered by the analysis, not only the number of apartments was larger, but also the comfort of living was improved (higher average usable floor area per capita).

In order to measure the correlation intensity between the level of tourist function performed by municipalities and the housing function, Spearman's rank correlation coefficient was calculated between the ranking positions assigned based on the value of $SMD_{housing}$ and SMD_{tur} . The set of SMD_{tur} positions (the measure calculated for 103 municipalities) was supplemented in accordance with the indications presented in the methodology. The results of correlation confirm a strong positive dependence

between the studied functions. In 2005, the value of the analyzed coefficient was 0.7345 and a decade later it declined to the level of 0.6904 units. It can be assumed that the development of housing function in popular tourist municipalities is a derivative of the natural values appreciated by tourists and thus the attractiveness of a municipality. The impact of tourist function on the local labour market is highly significant—the employment opportunity remains one of the important variables determining the choice of the place of residence.

4 Conclusions

An important result of the conducted research is determining that the municipalities territorially linked with national parks are significantly diversified in demographic terms—it directly affects the demand for real estate meeting the housing needs. These municipalities also differ in terms of their status—there are 11 urban municipalities in the analyzed group (i.e. municipalities representing a city), 31 urban–rural municipalities (i.e. municipalities covering a city and villages) and 75 rural municipalities (i.e. municipalities that do not include a city in their territory). The obtained results allow concluding that despite the above-mentioned differences almost all territorial units linked with national parks, in the period 2005–2015, were characterized by the development of residential real estate. It should be clearly emphasized that in 95% of the analyzed municipalities higher synthetic measure value of the housing function development was observed. It allows adopting the initial research hypothesis and concluding that the proximity of a national park stimulates the housing function. The above can also be considered an expression of public appreciation regarding environment quality in the place of residence and the perception of the highest rank protected areas' proximity in terms of an advantage for locating real estate meeting the housing needs.

It is also worth adding that in the majority of the analyzed municipalities the comfort of living measured by an increase in the average living space per capita, was improved, which can be considered the symptom of higher life quality of the local community. The carried out analyses indicate a strong, positive correlation between the tourist function and the housing function in the studied municipalities.

It can, therefore, be summed up that the attractive tourist areas were assessed as attractive places for permanent residence. It is of great importance to observe that the phenomenon of major depopulation occurred sporadically in the analyzed municipalities, and simultaneously in as many as 15 studied units their population increased by above 10% of the baseline year population. In view of the widespread decline in the number of residents in Poland, the aforementioned facts should be assessed as highly positive. The research results show that the proximity of national parks is perceived as good neighbourhood in Poland. Thus, it is difficult to consider the changes in the principles of spatial management referring to area forms of nature

protection as negatively affecting local development or life quality of the local community. The research results seem to confirm that the protected areas do not limit either economic activity or local development.

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Contemporary Trade Regionalism on the Example of Free Trade Area of the Asia-Pacific (FTAAP)



Sebastian Bobowski

Abstract The Free Trade Area of the Asia-Pacific (FTAAP) is a trade framework proposed during the meeting of Asia-Pacific Economic Cooperation (APEC) in Beijing in 2014, however, proposal was given initially in Hanoi in 2006. It may be considered as manifestation of mega-regionalism in trade, an attempt to set the rules of trade in the twenty-first century at the expense of multilateralism under the auspices of WTO, but also to overcome noodle bowl effect in the Asia-Pacific region. The main objective of the chapter is to study the project of FTAAP, using the concepts of trade regionalism and mega-regionalism, its genesis, economic, and political implications. As indicated by author, next to geographic scope of FTAAP, there is a concern resulting of the fact, that the concept of creating a free trade zone, a de facto mega-regional grouping, does not fully coincide with the concept of regional liberalization based on regulations promoted over the years by APEC and WTO rules. The same applies to the concept of open regionalism underlying the APEC. Author concluded that a hybrid approach and multitiered system might be a solution to enable individual states to proceed with convergence toward higher standards and gains, considering diversity of APEC member states. Alternatively, FTAAP could be made as an evolutionary agreement, while not excluding the possibility of the US membership inside a single framework with China.

Keywords FTAAP · APEC · Trade regionalism

1 Introduction

The Free Trade Area of the Asia-Pacific (FTAAP) is a trade bloc considered by 21 member states of Asia-Pacific Economic Cooperation—forum of trade regionalism, involving, among others, China, Japan, Canada, and the USA. Thus, if being

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successfully established, FTAAP would be the largest framework of trade regionalism in the world, able to overshadow those already signed/negotiated, such as Comprehensive Economic and Trade Agreement (CETA), Trans-Pacific Partnership (TPP), EU-Japan Economic Partnership Agreement (JEFTA), Regional Comprehensive Economic Partnership (RCEP), and Trans-Atlantic Trade and Investment Partnership (TTIP). Its size, however, should be considered in terms of both opportunity and threat because reaching an agreement and coexistence of two natural economic rivals at the global stage—China and the USA—inside one single bloc would be a challenge.

The main objective of this chapter is to study the project of FTAAP, using the concepts of trade regionalism and mega-regionalism, its genesis, economic, and political implications. The added value of this chapter is an in-depth study of the phenomenon of trade regionalism, taking into account contemporary trends and challenges in creating mega-regional structures. The structure of this chapter is as follows: theoretical frameworks of trade regionalism, including mega-regionalism, APEC as regional trade forum, economic potential of FTAAP, and scenarios for FTAAP. The following research methods were used: statistical and descriptive analysis, comparative, and critical studies.

2 Bilateralism, Inter-regionalism, Mega-Regionalism in Trade: Explaining the Conceptual Intricacies

In the literature, there are usually four types of trade regionalism distinguished, namely regional trade forum, regional trade cooperation not sanctioned by treaty, regional trade arrangements (RTAs) sanctioned by treaty, and economic partnership arrangements (Hamanaka 2010; Ravenhill 2008; Bobowski 2017, 2018). As of May 01, 2018, 673 notifications of RTAs (covering goods, services, and accessions separately) had been received by the GATT/WTO, of which 459 were in force. Cumulative number of physical RTAs in force was 287. Most of ratifications were made under Article 24 of GATT 1947 or GATT 1994, other sources of law were Article 5 of GATS and Enabling Clause (WTO 2018). Rapidly growing number of newly established trade agreements contributed to the so-called noodle bowl effect in many regions of the world, starting with East Asia and Latin America. This effect used to be studied through the prism of rising complexity of trade standards, overlapping and colliding rules of origin in bilateral merchandise flows. Therefore, expansionary bilateralism in trade after 2000, encouraged by non-satisfactory pace of multilateral negotiations at the level of WTO, inspired discussions about prospective consolidation of bilaterals in the name of harmonization of rules in the global trade regime to prevent from its further fragmentation (Bhagwati 2008).

What distinguishes mega-regionals, i.e., Comprehensive Economic and Trade Agreement (CETA), Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), Free Trade Area of Asia-Pacific (FTAAP), EU-Japan

Economic Partnership Agreement (JEFTA), Regional Comprehensive Economic Partnership (RCEP), and Trans-Atlantic Trade and Investment Partnership (TTIP) from the other RTAs is the geographical coverage and the size of internal market in terms of trade volume and GDP. In this context, mega-regionalism in trade has much in common with inter-regionalism as a concept. Namely, both mega- and inter-regional trade agreements may account for mass shares in global exports and GDP, whereas mega-regionals may transform into inter-regionals, as a consequence of replacement of the bloc-country format with the bloc-bloc format—for instance, mega-regional agreement between EU and Canada (CETA) could be enlarged to inter-regional agreement between EU and NAFTA (Canada, Mexico, and the USA), if the latter grouping would get such a mandate in the future from its members.

On the other hand, there is no clear distinction between mega-regionalism and bilateralism in the literature, because some agreements concluded between the blocs such as EU, EFTA, or ASEAN with the third countries are termed by Aggarwal and Fogarty (2004), Camroux (2006), Meissner (2016) as bilaterals (bloc-country), not necessarily mega-regionals. Therefore, categories of bilateral, mega-regional, and inter-regional trade agreements overlap to some extent, because mega-regionalism assumes interactions between the countries or regions, whereas inter-regionalism—between the regions, that may be studied either in political, economic, social, or geographical terms. Then, both Latin America, Central Europe, East Asia, or Asia-Pacific, as well as ASEAN, NAFTA, MERCOSUR, or EU can be regarded as regions nowadays, however, region as a party of any trade talks would be a grouping, more or less formal bloc of states or organization, not just a geographical representation of a given part of the world. Any agreement signed by the region with the third country, such as ASEAN Plus FTA or EU Plus FTA could be defined as mega-regional, however, what may be discussed here is the importance of a given bloc in the world trade, FDI flows, or global/regional value chains. On the other hand, as long as there are no agreed thresholds and the category of importance is relative, any FTA of that kind, e.g., EU—Singapore, ASEAN—Japan, or ASEAN—China, may be defined as mega-regional, because there are regional or global economic power/powers or important hub/hubs in the regional or global value chains involved. Thus, there is no contradiction in recognizing some of mega-regionals as a set of bilaterals, as well as some inter-regionals as mega-regionals. It seems that the terminology is still somewhat behind the dynamics of the phenomenon of trade regionalism. FTAAP fits into concept of mega-regionalism in trade due to its economic potential and formula of trade negotiations, namely, talks would involve national actors instead of any bloc or organization of states as the party. To date, 3 mega-regionals were signed, namely, CETA (October 30, 2016), CPTPP (March 08, 2018) and JEFTA (July 17, 2018), all of them still ahead of ratification, RCEP and TTIP are negotiated, while FTAAP is considered. Among the presented mega-regionals FTAAP, embracing 21 APEC member states, would be the largest trade bloc in terms of the shares in the global GDP—59.17%, and the second largest in terms of the shares in the global exports—45.48%, thus, slightly less than TTIP. Interestingly, mega-regionals' shares in the global GDP do not necessarily translate into the shares in the global exports, as it looks in case of RCEP, whereas both CETA

and JEFTA would account for 37–38% of the global exports, while making relatively lower contribution to global GDP.

3 Asia-Pacific Economic Cooperation (APEC) and Trade Regionalism

APEC was established in 1989 as regional trade framework, at the initiative of the Japanese Ministry of Trade and Industry (MITI) and the Australian Department of Foreign Affairs and Trade (DFAT). The mission statement of APEC is to build a dynamic and harmonious community by enhancing free and open trade and investment flows, regional economic integration, economic and technical cooperation, and sustainable business environment. Importantly, MITI insisted on the inclusion of the USA to influence on the regionalism processes in the Pacific sphere, appreciating the economic context of the US membership, contrary to diplomatic one.

Interestingly, at the beginning of the twenty-first century APEC started to put more and more emphasis on security issues, mainly because of the consequences of the terrorist attack in the USA on September 11, 2001. On the other hand, attention should be paid to the fact, that a number of documents are signed by “economic leaders”, and not “leaders” of APEC member states, which emphasizes the special interest of the forum in economic issues. APEC has 21 member states, namely Australia, Brunei Darussalam, Canada, Indonesia, Japan, Malaysia, New Zealand, the Philippines, Republic of Korea, Singapore, Thailand, and the USA (founding members in 1989), China, Chinese Taipei, and Hong Kong (joined in 1991), Mexico and Papua New Guinea (joined in 1993), Chile (joined in 1994), Peru, Russia, and Vietnam (joined in 1998). Numerous countries and territories, including Bangladesh, Cambodia, Costa Rica, Ecuador, Guam, India, Lao PDR, Macau, Mongolia, Pakistan, Panama, and Sri Lanka, applied for membership, however, since 1998 APEC leaders did not reach consensus in regard of further enlargement of the grouping. The European Commission (EC) requested observer status, whereas France demanded the status of a member due to territorial affiliations in the Asia-Pacific region. The USA unequivocally opposed to the formal involvement of European states, being afraid of erosion of its own influences. To date, however, only three organizations obtained a status of observer: the Association of Southeast Asian Nations (ASEAN) Secretariat, the Pacific Economic Cooperation Council (PECC), and the Pacific Islands Forum (PIF) Secretariat.

APEC used to be recognized as manifestation of open regionalism, attributes of which were defined by APEC Eminent Persons Group in 1994; they were as follows: maximization of possible scope of unilateral liberalization, further reduction of barriers in trade with third countries, accompanied by internal liberalization based on the MFN clause, extension of regional liberalization of trade and investment policy to third countries at unilateral basis or under mutual benefits, either conditionally or unconditionally (APEC 1994). Such nonexclusive multilateral

agreements, open to the accession of new member states, should comply fully with Article 24 of GATT, while not evolving into competing groupings.

At the sixth APEC Summit in Bogor (Indonesia) on November 16, 1994, the so-called Bogor goals were agreed, according to which free and open trade and investment regime in the Asia-Pacific region will be established by 2020 at the latest, with a limit date of 2010 for developed members. In subsequent years, the mechanisms of achieving goals from Bogor, as well as their adaptation to the changing international conditions were discussed. For instance, at the seventh APEC Summit in Osaka (Japan) on November 18–19, 1995, leaders approved Osaka Action Plan on the liberalization of trade and investment flows, as well as technological and sectoral cooperation, business facilities, at the eighth APEC Summit in Subic (Philippines) on November 24–25, 1996, the APEC Action Plan for the advancement of liberalization of trade and investment flows was agreed, in the following year in Vancouver (Canada) on November 24–25, the strategy of liberalization of 15 sectors of the economy within the so-called early voluntary sectoral liberalization (EVSL) was signed.

As a result of the Asian financial crisis 1997–98, newly established framework of ASEAN Plus Three (10 ASEAN member states plus China, Japan, and Republic of Korea) seized the initiative in the field of financial and economic cooperation in East Asia, marginalizing to some extent the importance of APEC as an economic forum in this part of the world. Consequently, APEC leaders marginalized the agenda for trade and investment cooperation until 2005. At the 17th APEC Summit in Busan (Republic of Korea) organized on November 18–19, 2005, the so-called Busan Roadmap was adopted to set directions of joint and individual projects of APEC members to promote a multilateral trading system based on high-quality regional trade agreements (RTA). In 2008, APEC Committee on Trade and Investment (CTI) published a set of 15 chapters of model solutions in the field of trade and customs facilitation. The guidelines were designed to assist member states in RTAs/FTAs negotiations in order to maximize benefits and avoid possible regulatory conflicts between individual agreements.

In 2009, two rounds of the Trade Policy Dialogue (TPD) were held at the APEC forum, the subject of which was the Asia-Pacific Free Trade Area (FTAAP), which will ultimately constitute the pillar of economic integration of the member states. The subject of the discussion were the potential paths of establishing FTAAP, for instance, through the merger of regional trade agreements, which involve member states, based on a convergence and divergence protocol, extending the negotiation agenda with new issues arising from the challenges of the twenty-first century economy, preparing a schedule of activities at the level of the APEC Business Advisory Council (ABAC). At the 21st APEC Summit in Singapore in November 2009 Australia, China, New Zealand, and the Republic of Korea submitted their own report on the economic implications of FTAAP. It reviewed regional trade agreements (RTAs), which involve APEC members, formulating appropriate recommendations regarding the desired shape of FTAAP based on an analysis of its implications using the computable general equilibrium (CGE) modeling (static, dynamic, and capital accumulation). An important postulate was the development

of competences of APEC developing countries in the scope of negotiating RTA, which was also noticed by CTI. The latter declared cooperation in this regard with international organizations, i.e., Asian Development Bank (ADB), The United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), The Organization for Economic Cooperation and Development (OECD), World Trade Organization (WTO), and The United Nations Conference on Trade and Development (UNCTAD).

On November 07–11, 2014, at the 26th APEC Summit in Beijing (China), a document entitled *The Beijing Roadmap for APEC's Contribution to the Realization of the FTAAP* was adopted. The roadmap provided for the implementation by the end of 2016 of a Collective Strategic Research on Issues on the Realization of the FTAAP, referring to the potential economic and social benefits and costs of the proposed FTA, implementation scenarios, as well as the related challenges for the member economies. In addition, the APEC countries agreed to establish the APEC Information Sharing Mechanism on Regional Trade Agreements (RTAs)/Free Trade Agreements (FTAs) to improve access to data on RTAs/FTAs, in particular, WTO-Plus elements, to enhance regular dialogue and reporting on trade agreements involving APEC countries, as well as to strengthen and use the WTO's RTA transparency mechanism. Importantly, however, the RTAs/FTAs comparative tool, supported by CTI and relevant member states' authorities, set of guidelines for FTA negotiations, as well as the Inventory of RTAs Involving APEC Members and APEC Market Access Group Presentations On Free Trade Agreements, all of them available on the official website of APEC, have not been updated for over 10 years.

Moreover, APEC's Committee on Trade and Investment has implemented two [Action Plan Framework for Regional Economic Integration Capacity Building Needs Initiative](#)—for the years 2012–2014 and, as a result of the APEC Summit in Beijing, for 2015–2017. The Competitiveness Building Need Initiative organized a series of workshops in 2014: on public procurement in Ho Chi Minh City (Vietnam, January 9–10), negotiating the FTA in Qingdao (China, May 6–7), collaterals, including transitional collateral in Surabaya (Indonesia, June 10–11), schedule of FTA commitments in services and investments (Singapore, October 28–29), intellectual property in Ho Chi Minh City (Vietnam, December 17–18). There is as yet no information on initiatives under the second framework plan for 2015–2017, that was expected to facilitate the possible implementation of FTAAP. In the light of the official declarations of the high representatives of APEC, the forum is currently focused on “next generation” trade and investment issues, i.e., the impact of local contribution requirements on regional integration and economic growth, employment, and competitiveness support for trade promotion, services of the manufacturing sector in supply and value chains.

ABAC (2014) indicated the need to achieve a high quality, ambitious, and comprehensive agreement in the negotiations of TPP, RCEP, or Pacific Alliance (PA), that would enable future convergence toward FTAAP. At the time, however, it was acknowledged, that the RCEP negotiation process was still in progress, while the agenda—insufficiently ambitious to meet the FTAAP criteria, so that particular

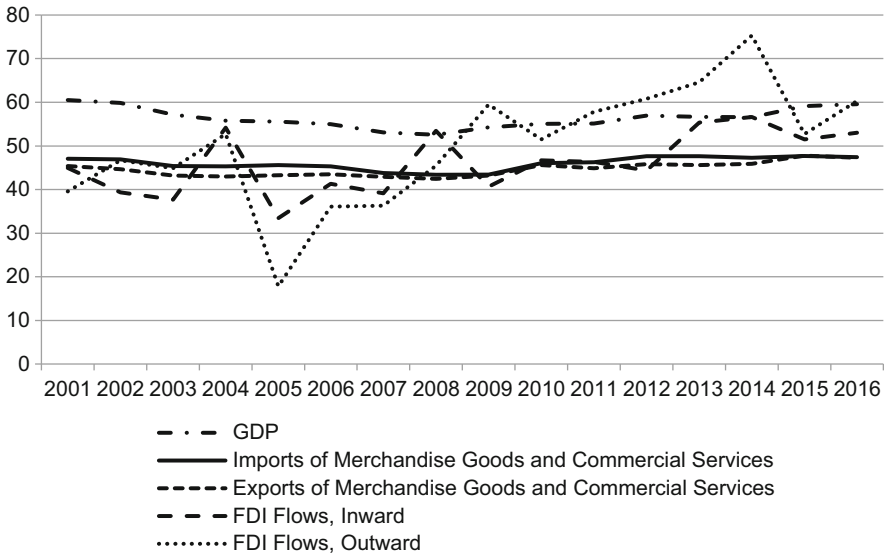


Fig. 1 Selected macroeconomic indicators of APEC, 2001–2016 (shares of world total). Source: Own calculations based on APEC (2018)

hopes were associated with a much more ambitious TPP project, that was finally replaced by CPTPP due to withdrawal of the USA in the early 2017.

4 Economic Potential of FTAAP

Twenty-one APEC member states accounted for nearly 60% of the global GDP, with downward trend in years 2001–2008 (in the period of the global crisis 2008+ shares dropped to 52.55%), however, since 2009 an upward trend resulted in reaching the shares comparable to 2001 (see Fig. 1). Similarly, APEC’s shares in the global imports and exports of merchandise goods and commercial services in years 2001 and 2016 were comparably high (45–47%), with nonsignificant fluctuations in the studied period. On the other hand, FDI flows proved to be variable and dynamic through the years, with special regard to outflows (an upward trend in years 2011–2014 resulted in a peak of 75.31% of shares in the world total), whereas in 2005 they reached the lowest level of 17.81%. FDI inflows fluctuated to a lesser extent in respective period, with a peak reached in 2014 (56.62%) and the lowest level in 2005 (33.44%).

There is a huge disparity in terms of nominal GDP and GDP per capita among APEC member states, especially when comparing the smallest and the poorest economy of Papua New Guinea with the USA—the latter recorded 921 times higher GDP and 23 times higher GDP per capita in 2016 (see Table 1). The Chinese and the

Table 1 Selected macroeconomic indicators of 21 APEC member states, 2016

	GDP, current USD (in millions)	GDP per capita, current USD	GDP growth rate (annual %)	Consumer prices (annual %)	Unemployment rate, total (% of labor force)	Value added, agriculture (% of GDP)	Value added, industry (% of GDP)	Value added, services (% of GDP)	Current account balance (% of GDP)	Public sector cash surplus/deficit (% of GDP)	Economic freedom of the world index (rating)	Ease of doing business index (Rank)	Corruption perceptions index (score)
Australia	1,204,626	49,755.32	2.77	1.28	5.72	2.61	24.33	73.07	-3.07	-2.37	7.99 ^a	15	79
Brunei Darussalam	11,400.65	26,939.42	-2.47	-0.74	6.94	1.20	57.29	41.51	15.49	n/a	n/a	72	58
Canada	1535.77	42,348.95	1.41	1.43	7	1.5 ^b	29.4 ^b	69.10 ^b	-3.22	0.14	7.94 ^a	22	82
Chile	247,027.9	13,792.93	1.59	3.79	6.74	4.30	31.29	64.40	-1.42	-2.76	7.77 ^a	57	66
China	11,199.15	8123.18	6.69	2	4.65	8.56	39.81	51.63	1.81	-0.4 ^a	6.40 ^a	78	40
Hong Kong	320,910.2	43,740.99	2.05	2.41	3.35	0.08	7.69	92.23	3.96	n/a	8.97 ^a	4	77
Indonesia	932,259.2	3570.30	5.02	3.53	4.12	13.95	40.77	45.28	-1.82	-2.48	7.00 ^a	91	37
Japan	4949.27	38,972.34	0.94	-0.12	3.13	1.16	29.53	69.31	3.1	-4.60	7.47 ^a	34	72
Republic of Korea	1411.25	27,538.81	2.83	0.97	3.71	2.20	38.56	59.24	n/a	2.00	7.54 ^a	5	53
Malaysia	296,535.9	9508.24	4.22	2.09	3.44	8.66	38.34	53.01	2.33	-3.07	7.19 ^a	23	49
Mexico	1046.92	8208.56	2.29	2.82	3.88	3.83	32.75	63.42	-2.18	-1.72	6.78 ^a	47	30
New Zealand	184,970.7	39,412.49	3.05	0.65	5.11	6.8 ^b	21.8 ^b	71.4 ^b	-2.37	0.83	8.48 ^a	1	90
Papua New Guinea	20,213.21	2500.09	2.40	6.67	2.64	18.8 ^b	33.7 ^b	47.5 ^b	25.63	-4.87	6.42 ^a	119	28
Peru	192,207.3	6049.23	3.88	3.60	3.53	7.60	32.54	59.87	-2.76	-2.51	7.44 ^a	54	35
The Philippines	304,905.4	2951.07	6.93	1.25	2.71	9.65	30.83	59.52	n/a	-2.28	7.47 ^a	99	35
Russia	1283.16	8748.37	-0.22	7.04	5.54	4.74	32.42	62.84	n/a	-2.16	6.60 ^a	40	29
Singapore	296,975.7	52,962.49	2.00	-0.53	1.8	0.04	26.14	73.82	19.81	5.41	8.81 ^a	2	84
Chinese Taipei	530.53	22,561	1.41	1.39	3.92	1.79	35.48	62.62	13.72	-0.3	7.70 ^a	11	61

Thailand	407,026.1	5910.62	3.24	0.19	0.94	8.35	35.82	55.83	11.85	0.45	6.75 ^a	46	35
United States	18,624.48	57,638.16	1.49	1.26	4.87	1.1 ^a	20.0 ^b	78.9 ^a	-2.43	-3.96	7.94 ^a	8	74
Vietnam	205,276.2	2170.65	6.21	3.24	2.1	18.14	36.37	45.49	4.01	n/a	6.30 ^b	82	33

n/a not available

Source: Own elaboration based on APEC (2018)

^aData of 2015

^bData of 2014

US economies, when combined, accounted for 65.97% of the APEC GDP in respective year. Among the countries with the highest GDP per capita, next to the USA, there were also Singapore, Australia, Hong Kong, Canada, New Zealand, and Japan, with much poorer economies of the aforementioned Papua New Guinea, Vietnam, the Philippines, and Indonesia. Interestingly, ASEAN member states proved to be one of the most dynamic economies in 2016, with annual growth rate exceeding 4–5%. Moderate inflation rates characterized most of the APEC economies in the studied year, except for Papua New Guinea and Russia (6.7–7%), unemployment rate was the highest in Canada, Brunei Darussalam, and Chile (6.7–7%). Two member states with the lowest GDP per capita—Papua New Guinea and the Philippines—recorded the highest value added of agriculture sector in GDP, exceeding 18%, with nearly no contribution in case of Hong Kong and Singapore, and indicators below 2% for Brunei Darussalam, Canada, Japan, Chinese Taipei, and the USA. Industry proved to be dominant in terms of value added to GDP in case of Brunei Darussalam (57%), followed by Indonesia, China, Republic of Korea, and Malaysia (38–40%), with the lowest shares in case of Hong Kong (7.7%), and the USA (20%). The service sector accounted for over 92% of GDP of Hong Kong, slightly less in case of Singapore, Australia, New Zealand, and Japan (69.3–73.8%). The highest surplus on the current account in relation to GDP was recorded by Papua New Guinea, Singapore, and Brunei Darussalam (15.5–25.6%), the highest deficit—by Canada and Australia (3–3.2% of GDP). Furthermore, only 5 APEC members had a cash surplus in 2016, with the highest ratios of Singapore (5.4%) and Republic of Korea (2%), whereas Papua New Guinea, Japan, and the USA recorded the highest deficits (3.9–4.9% of GDP). Not surprisingly, Singapore, followed by Hong Kong and Australia, recorded one of the best indexes in the ranks of Economic Freedom of the World, Ease of Doing Business and Corruption Perceptions, with relatively poorer positions of developing member states of APEC. Worth mentioning, among top five economies in the Ease of Doing Business rank in 2016 there were four APEC member states, namely New Zealand, Singapore, Hong Kong, and Republic of Korea.

Both the USA and China were dominant importers and exporters in 2016 in the group of APEC member states (each exceeding 2 trillion USD annually), whereas the highest shares of both imports and exports of merchandise goods and commercial services in GDP were recorded by Hong Kong and Singapore (150.6–193.7%), with the lowest shares (of 20% of GDP or less) in case of Australia, China, Indonesia, Japan, and the USA (except for Papua New Guinea, which recorded relatively low shares of imports of merchandise goods and commercial services in GDP—16.9%, while the shares of exports in respective period proved to be much higher—40.9%; see Table 2).

The highest surpluses on the current account in nominal terms were recorded by China and Japan (202.2 and 193.9 billion USD), followed by Singapore and Thailand (58.8 and 48.2 billion USD), while the highest deficits were recorded by the USA (451.7 billion USD), followed by Canada, Australia, and Mexico (49.4, 37.0, and 22.8 billion USD, respectively). Comparable analysis of MFN Applied Tariffs indicated that the simple average rate for all products was the highest in case

Table 2 Selected trade-related indicators of 21 APEC member states, 2016

	Imports of merchandise goods and commercial services (in current USD millions)	Imports of merchandise goods and commercial services (% of GDP)	Exports of merchandise goods and commercial services (in current USD millions)	Exports of merchandise goods and commercial services (% of GDP)	Current account balance (in current USD millions)	MFN applied tariff, simple average, all products (rate)	MFN applied tariff, simple average, agricultural products (rate)	MFN applied tariff, duty-free, all products (% of HS 6-digit subheadings)	MFN applied tariff, duty-free, agricultural products (% of HS 6-digit subheadings)	MFN applied tariff, duty-free, nonagricultural products (% of HS 6-digit subheadings)	Economic freedom of the world index, nontariff trade barriers (rating)	Economic freedom of the world index, mean tariff rate (rating)
Australia	251,069.7	20.84	244,689.2	20.31	-37,026	2.5	1.2	50.3	77	45.9	6.5 ^a	9.5 ^a
Brunei Darussalam	4285.47	37.59	5732.46	50.28	1766.39	1.2	0.1	82.3	98.5	79.6	4.94 ^a	9.76 ^a
Canada	511,803.4	33.32	471,279.3	30.69	-49,423.1	4.1	15.6	75.8	59.6	78.5	5.75 ^a	9.16 ^a
Chile	71,467.1	28.93	70,097.64	28.38	-3,499.42	6	6	0.3	0	0.3	8.8 ^a	8.8 ^a
China	2,037,148	18.19	2,305,952	20.59	202,203.4	9.9	15.5	7	7.2	6.9	5.49 ^a	8.02 ^a
Hong Kong	621,653.4	193.72	615,171.4	191.70	12,711.2	0	0	100	100	100	7.51 ^a	10 ^a
Indonesia	165,948.1	17.81	167,392.8	17.96	-16,952.3	7.9	8.4	12.7	8.5	13.4	8.62 ^a	8.62 ^a
Japan	790,051.6	15.96	813,718.4	16.44	193,996	4	13.1	52.9	36.5	55.7	5.3 ^a	9.2 ^a
Republic of Korea	n/a	n/a	n/a	n/a	n/a	13.9	56.9	15.1	5.6	16.7	n/a	n/a
Malaysia	208,054.9	70.16	224,864.5	75.83	6920.85	5.8	8.4	65.7	75	64.2	8.78 ^a	8.78 ^a
Mexico	430,870.2	41.16	398,389.1	38.05	-22,828.4	7	14.6	50.3	20.7	55.2	5.7 ^a	8.58 ^a
New Zealand	47,875.91	25.88	48,523.08	26.23	-4376.61	2	1.4	63.9	72.4	62.5	7.2 ^a	9.6 ^a
Papua New Guinea	3416.34	16.90	8279.3	40.96	5180.99	4.7 ^b	12.7 ^b	76.2 ^b	47.4 ^b	81.0 ^b	5.28 ^a	9.06 ^a
Peru	44,384.03	23.09	43,172.95	22.46	-5303.45	2.4 ^a	2.8 ^a	67.5 ^a	52.6 ^a	70 ^a	5.53 ^a	9.52 ^a
The Philippines	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Russia	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Singapore	447,264.7	150.61	487,442.4	164.14	58,844.64	0	0.1	100	99.8	100	7.95 ^a	9.96 ^a
Chinese Taipei	281,599.1	53.08	321,343.4	60.57	72,781	6.4	15.7	30.2	25	31.1	6.56 ^a	8.72 ^a
Thailand	237,340.6	58.31	282,781.6	69.48	48,237.24	11 ^a	30.7 ^a	35.3 ^a	11.8 ^a	39.2	7.8 ^a	7.8 ^a

(continued)

Table 2 (continued)

	Imports of merchandise goods and commercial services (in current USD millions)	Imports of merchandise goods and commercial services (% of GDP)	Exports of merchandise goods and commercial services (in current USD millions)	Exports of merchandise goods and commercial services (% of GDP)	Current account balance (in current USD millions)	MFN applied tariff, simple average, agricultural products (rate)	MFN applied tariff, simple average, nonagricultural products (rate)	MFN applied tariff, duty-free, agricultural products (% of HS 6-digit subheadings)	MFN applied tariff, duty-free, agricultural products (% of HS 6-digit subheadings)	MFN applied tariff, duty-free, nonagricultural products (% of HS 6-digit subheadings)	Economic freedom of the world index, nontariff barriers (rating)	Economic freedom of the world index, mean tariff rate (rating)
United States	2,733,280	14.68	2,184,565	11.73	-451,692	5.2	3.2	30.8	48.4	48.4	6.37 ^a	9.3 ^a
Vietnam	191,102.8	93.10	188,716.8	91.93	82.35	n/a	n/a	n/a	n/a	n/a	4.89 ^a	7.16 ^a

n/a not available

Source: Own elaboration based on APEC (2018)

^aData of 2015

^bData of 2014

of Republic of Korea and Thailand (13.9 and 1%), the lowest in case of Singapore, Brunei Darussalam, New Zealand, and Australia (0–2.5%). When studying agricultural products, the simple average rate of MFN Applied Tariffs in 2016 was the highest in case of Republic of Korea and Thailand (56.9 and 30.7%), the lowest in case of Singapore, Brunei Darussalam, New Zealand, and Australia (0.1–1.4%). The highest simple average rates of MFN Applied Tariffs in trade in nonagricultural products were imposed by China, Indonesia, and Thailand (7.7–9%), the lowest—by Hong Kong, Singapore, and Brunei Darussalam (0–1.3%). Further analysis of MFN Applied Tariffs in terms of duty-free access as percentage of HS 6-digit subheadings indicated, that Hong Kong and Singapore recorded an indicator of 100%, with relatively high results of Brunei Darussalam, Papua New Guinea, and Canada (75.8–82.3%). On the other hand, Chile provided almost none of such preferences, whereas China—only within 7% of HS 6-digit subheadings. Indicators proved to be much higher in case of agricultural products, than in case of nonagricultural goods for Australia, Brunei Darussalam, Malaysia, and New Zealand, whereas most of APEC members used to restrict an access to markets to a larger extent for nonagricultural products (except for Hong Kong with 100% of coverage in both types of goods). Going further, among 21 economies of the Asia-Pacific region, Hong Kong, Singapore, Brunei Darussalam, New Zealand, Peru, and Australia enjoyed relatively higher positions in the rating of Economic Freedom of the World Index—Mean Tariff Rate (9.5 and more), whereas in case of nontariff trade barriers—Singapore, Hong Kong, New Zealand, Chile, Malaysia, Chinese Taipei, and Australia (6.5 and more).

Remarks resulting from indicatory analysis are as follows. Firstly, 21 APEC member states, when combined, represent potential to establish the largest trade bloc in the world, embracing three major economic players on the global stage, namely, China, Japan, and the USA. Secondly, APEC's shares in the world GDP, imports and exports reached pre-crisis levels in 2016, except for FDI inflows and outflows, which increased their shares in the world total from below 40 up to 50–60% in the studied period. Thirdly, APEC member economies are highly diversified in terms of nominal size and GDP per capita, with both large economies of relatively lower income per capita, such as Indonesia, Thailand, or the Philippines, as well as smaller economies, in nominal terms with relatively higher income per capita such as Brunei Darussalam or Chinese Taipei. Fourthly, the fact of significant dominance of the USA and China in both GDP, trade, and capital flows within APEC member states makes bilateral relations between those two economies and their individual performance crucial for prosperity and position of the whole grouping in the global economy (including the impact of recession in the USA, as well as economic slowdown in China after 2007). Fifthly, ASEAN member states proved to be one of the most dynamic economies in 2016, with annual growth rate exceeding 4–5%. Sixthly, moderate inflation rates characterized most of the APEC economies in the studied year, except for Papua New Guinea and Russia (6.7–7%), unemployment rate was the highest in Canada, Brunei Darussalam, and Chile (6.7–7%). Seventhly, member states with the lowest GDP per capita used to maintain relatively high shares of agriculture in GDP, whereas those with pretty low or no

impact of this sector where mostly dominated by service sector, i.e., Hong Kong and Singapore. Eighthly, industry played a key role, in terms of added value to GDP, in selected East Asian economies, such as China, Republic of Korea, Brunei Darussalam, Indonesia, and Malaysia (38–57%). Ninthly, many developed economies inside APEC such as Australia, Canada, Japan, and the USA, recorded deficits on current account or cash deficit in 2016. Tenthly, among APEC member states there are highly ranked economies such as Hong Kong, Singapore, Australia, New Zealand, and Australia, recognized as competitive, attractive destinations for business—those countries not only imposed no or pretty low tariffs on agricultural and nonagricultural goods, but also eliminated most of nontariff barriers to trade.

5 Scenarios for FTAAP

Free Trade Area of Asia-Pacific (FTAAP) was considered as an output of already emerging mega-regionals, which involved regional countries in various configurations, namely, Trans-Pacific Partnership (TPP) and Regional Comprehensive Economic Partnership (RCEP). Those two mega-regionals overlapped in terms of membership, namely ASEAN-4 (Brunei Darussalam, Malaysia, Singapore, and Vietnam), Australia, New Zealand, and Japan expressed the will to enter both blocs. Importantly, TPP used to be recognized as US-led project that involved 12 APEC members, whereas RCEP—China-led project, involving 12 APEC members plus three less developed ASEAN countries (Cambodia, Lao PDR, and Myanmar) and India. The fact that two largest APEC economies attempted to establish separate, competitive trade frameworks with a group of APEC members indicates the scale of a challenge related to establishment of FTAAP.

Even though both mega-regionals were recognized by APEC leaders as potential platforms for the future development of FTAAP, they differed significantly in terms of scope. Namely, TPP assumed deeper integration and more intrusive agenda going beyond WTO guidelines in regard of government procurement, competition policy, labor standards, intellectual property rights, investment policy, and environmental standards. RCEP, on the other hand, involved greater initial scope for liberalization, as existing tariff and nontariff barriers imposed on services trade and investment proved to be higher, than in case of TPP. Considering higher quality and standards inside agenda of TPP, it should be recognized as the best pathway to implement FTAAP. More ambitious FTAAP might attract new entrants, contribute to deeper liberalization, lead to consolidation of regional agreements to dismantle the so-called noodle bowl in trade regionalism.

As Tran and Heal (2014) indicated, compositions of trade in TPP and RCEP were quite similar, with relatively higher shares of transportation and machinery equipment in case of TPP, manufactured goods in case of RCEP. The reason is that RCEP members, with special regard to ASEAN and China, are more deeply engaged in the global and regional value and supply chains. The shares of medium-tech goods were higher in trade of TPP countries, whereas RCEP were more intensively engaged in

trade in resource-based products. Interestingly, due to high importance of electronics industry in trade of China, Malaysia, and Republic of Korea, RCEP recorded higher shares of trade in high-tech goods than TPP, however, not necessarily because of high added value. Furthermore, applied tariff rates were lower on average in case of TPP countries (2.55%), when compared to RCEP (8.66%). Another important aspect of both mega-regionals was rules of origin, that used to be blamed for the noodle bowl effect. Namely, overlapping, diversified requirements and criteria to be met to determine economic nationality of products, such as location of the last significant transformation or the highest input, discourage enterprises from utilizing FTA preferences. The so-called noodle bowl effect may be addressed here through harmonization of numerous rules of origin agreed formerly in bilateral format, however, only TPP members decided to establish a single regime in this regard. Importantly, some inputs from non-TPP countries could preclude preferential treatment of the finished goods that questioned benefits of TPP economies involved in international supply chains, i.e., Vietnam in textile industry. Moreover, nontariff measures were addressed by both mega-regionals, however, RCEP seemed to deliver relatively smaller gains, when compared to TPP. The latter, however, faced the problem of diversified level of development and profile of member economies, that made concessions, such as standards harmonization, pretty difficult in practice.

As Basu Das (2014) argued, services trade liberalization would be much bigger challenge for RCEP, than TPP, mostly due to the fact, that previously established ASEAN Framework Agreement on Services (AFAS), ASEAN Plus FTAs with Australia, New Zealand, China, and Republic of Korea, as well as regulations in this regard under ASEAN Economic Community (AEC) met WTO's commitments under GATS. On the other hand, there were no regulations addressing, for instance, land ownership, foreign equity participation and cross-border movements of professionals because of political obstacles. TPP members, on the other hand, opted for less restrictive services trade regime, seeking for possibilities in respect of mutual recognition of qualifications, competition policy, government procurement, labor mobility, and interoperability of standards. This, in turn, was expected to improve market access of TPP members in such areas as financial and telecommunications services, insurance, and e-commerce. Separate challenge for both mega-regionals was the investment liberalization, because member states addressed this issue in the former FTAs in relatively limited scope. In case of TPP, however, Investor-State Dispute Settlement mechanism was established, that proved to be very controversial, considering ability of the national government to undertake actions in the name of public interest, whereas harming businesses.

Two years after APEC leaders' meeting in Beijing political landscape significantly changed due to presidential election in the USA, won by Donald Trump. Importantly, at his first day in power, Trump withdrew his country from the TPP, that was finally revised by remaining eleven signatory parties and signed on March 08, 2018, as CPTPP, with relatively lower shares in both global GDP and exports. Still, it is uncertain whether TTIP talks will be continued, considering recent changes in the US trade agenda under Trump administration. Namely, it seems that Trump is moving toward bilateralism at the expense of plurilateral and mega-regional trade

agreements to advantage his country over the others. This, in turn, would favor consolidation of the other countries in trade talks with Americans. As already stated, the last negotiation round of TTIP was organized in October 2016, just before the presidential election in the USA. Moreover, recent decisions of Trump to introduce duties on numerous imported products, starting with steel and aluminum, threatened trade war with the European Union and China, while indicating protectionist course of the US authorities these days.

If being successfully ratified, CPTPP might hypothetically attract new entrants from ASEAN region, starting with Indonesia, Thailand, and the Philippines, encouraged by most advanced agenda of cooperation when compared to RCEP, that, in turn, may lead to gradual inclusion of the latter instead of advancing competitive framework in parallel to CPTPP. On the other hand, disadvantaged position and attractiveness of CPTPP related to limited size and impact on the international trade regime, when compared to the other mega-regionals, may enhance further progress of RCEP talks. Both scenarios might pave the way to FTAAP, however, at the current stage—emerging trade war, uncertain future of NAFTA and competitive mega-regional frameworks of CPTPP and RCEP—without the USA anymore.

FTAAP project would be enhanced by fusion of CPTPP and RCEP, with China, Japan, Republic of Korea, India, and Australia inside the single trade bloc. Only then, the US stance toward FTAAP membership may be considered or, if not willing to coexist with China, CPTPP membership. Pretty challenging may be the approval of the latecomer status by the USA, thus, involvement of this country in FTAAP project seems to be probable only with the prospective founding member status. Furthermore, agenda of the newly established bloc would have to challenge the problem of membership of non-APEC states, such as three less developed ASEAN members, namely, Cambodia, Lao PDR, Myanmar, as well as India. Unquestionably, two mega-regional trade blocs established by the European Union, namely, CETA and JEFTA, currently at the stage of ratification, would overshadow China-led RCEP. Newly established JEFTA may leverage the position of Japan in the Asia-Pacific trade regionalism, enhancing acceleration of RCEP talks, as well as hypothetical fusion with CPTPP to counter the US influences in the region. If so, fusion of CPTPP and RCEP would be feasible under trilateral agreement between China, Japan, and Republic of Korea and combination of both hard elements of CPTPP and soft elements of RCEP. As Schott (2014) suggested, CPTPP members could be linked through more comprehensive provisions within FTAAP framework. Under such a multitiered hybrid system, countries might be able to select between CPTPP, RCEP, or FTAAP standards. As Petri et al. (2014) argued, every country would be expected to converge toward the highest standards at its own pace. Another option is making FTAAP an evolutionary agreement, following experiences of ASEAN Plus FTAs.

Another difficult issue is whether FTAAP is feasible under the auspices of APEC without the USA as a member of trade bloc. What may be observed nowadays is an attempt of the US administration to overthrow the old order and then, probably, to build a new order on the ruins. There is one certain thing in this regard. Being aware of business approach of Trump to politics, it seems that he might decide to engage in

trade mega-regionalism in the Asia-Pacific, if there will be more to lose than to gain when staying aside.

6 Conclusion

The Free Trade Area of the Asia-Pacific was proposed at the APEC meeting in Beijing in 2014, that cannot be found as coincidence. Namely, China, being aware of the ongoing TPP and RCEP negotiations realized that more advanced and comprehensive agenda of the USA-led project might attract more entrants in the future, including RCEP economies from Southeast Asia, as well as Republic of Korea or India. On the other hand, RCEP was built on a set of bilateral ASEAN Plus FTAs, that precluded possibility of enlargement of this bloc in the near perspective. Therefore, proposal of FTAAP was strongly advocated by China, attempting to make a kind of “escape forward,” with no enthusiasm on the US side.

As indicated, FTAAP, if being established, would be the largest trade bloc in the world in terms of shares in the world GDP, trade and investment flows, however, its success is dependent on the bilateral consensus of the two largest countries—China and the USA—both political and economic rivals at the global stage nowadays. Successful conclusion of TPP talks encouraged acceleration of RCEP talks, however, as a consequence of presidential election in the USA in 2016, trade agenda of this country significantly changed. Namely, Trump decided to withdraw his country from TPP that resulted in reconstruction of this mega-regional agreement in the form of CPTPP of much lower economic importance. This, in turn, left a kind of vacuum for China-led RCEP, as the only mega-regional trade agreement in this part of the world that is still under negotiation.

The challenge for the FTAAP project is not only the geographic scope, but also the fact, that the concept of creating a free trade zone, a de facto mega-regional grouping, does not fully coincide with the concept of regional liberalization based on regulations promoted over the years by APEC and WTO rules, which rejects the possibility of creating own solutions on such issues as competition policy, investment policy, or dispute resolution, as does the EU. Moreover, respect for the independence of the member states, manifesting itself, among others, by making decisions by consensus, not voting, the lack of formal organizational structures, or the means of pressure on countries, that do not fulfill their obligations, as well as the idea of open regionalism underlying the APEC, assuming the possibility of benefiting from liberalization and integration processes by countries outside the region, makes the FTAAP project extremely difficult to implement.

There is a question about the future format of APEC. Undoubtedly, the free trade area could gain an institutional foundation in the case of a strong formalized economic and political structure, however, it is much more difficult to implement such a structure under the auspices of a flexible association of 21 countries seeking to standardize procedures and cooperate for economic growth and development in the region.

The 21 APEC member states as prospective founding members of FTAAP are highly diversified in respect of overall development performance and attributes, thus, building this trade bloc on the foundation of more intrusive and higher quality agenda of CPTPP may discourage less developed member economies of APEC, paying prospectively higher costs of adjustment and convergence, when compared to developed partners. This proved to be true, among others, in case of nontariff barriers to trade, such as rules of origin, responsible for the so-called noodle bowl effect in trade regionalism, as well as standards harmonization, services trade and investment liberalization. On the one hand, it seems to be less probable nowadays to build FTAAP on the platform of CPTPP, than 2 years ago on the platform of TPP with the USA. On the other hand, there is a higher probability of fusion of CPTPP and RCEP without the USA because China's position may be leveraged at the expense of the US absence, whereas Japan may opt for higher standards, than those under China-led RCEP, enhancing "socialization" of Northeast Asian neighbor.

A hybrid approach and multitiered system might be a solution to enable individual states to proceed with convergence toward higher standards and gains. Alternatively, FTAAP could be made as an evolutionary agreement, even without the USA at the initial stage. The only doubt here is whether North American power will approve a latecomer status.

Hypothetical success of CPTPP and RCEP might deleverage the US position in the Asia-Pacific trade regionalism and multilateral system under the auspices of WTO, as countries like Japan, Canada, Mexico, Australia, Republic of Korea, India, or China proceed with plurilateral agreements with both regional and nonregional partners, i.e., the European Union (CETA and JEFTA were already signed, EU-Mexico FTA talks are in progress). Therefore, it is not obvious, whether Trump is willing—and if yes—is able to dismantle and reconstruct the world trade system, by destructing TPP, NAFTA and TTIP, up to FTAAP, the latter still in the phase of consideration. The contemporary US course toward protectionism and bilateralism in international trade would be a step backward for the world economy and multilateral dialogue at the forum of WTO, thus, other economies should continue their efforts and initiatives in the name of liberalization and fairness in trade. Taking into account Trump's business approach to politics, he might decide to go back to mega-regional trade dialogue, if there will be more to lose than to gain when staying aside. That is why it is so important to support mega-regionalism in trade and make it successful—in business only strong players are respected.

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Financial Vulnerability of NGOs in Southeast Anatolia and Mediterranean Regions



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Abstract The availability of financial resources for NGOs is vulnerable to external and internal challenges. Therefore, it is debatable whether current financial resources of NGOs are sufficient or not. NGOs face great challenges to balance and diversify their financial resources to decrease their financial vulnerability to pursue their social missions and organizational goals. This study provides an empirical analysis of financial vulnerability of NGOs in Turkey with the case of Youth NGOs in Southeast Anatolia Region ($n = 103$) and Mediterranean Region ($n = 100$) of Turkey. The data was gathered from a semi-structured and detailed survey with 280 items among 203 representatives of Youth NGOs, and discussions and observations during 5 one-day workshops in both regions organized by the Turkish Ministry of Youth and Sports. The revenue concentration of Youth NGOs as an indicator of financial vulnerability was operationalized by revenue concentration index, which is similar to Hirschman–Herfindahl Index (HHI). NGOs with revenue concentration index of one (1.00) are considered to have lower level of revenue diversification, while NGOs with revenue concentration index of zero (0.00) are considered to have higher revenue diversification. The results of calculations were coded to test possible interactions and relations between dependent variable and independent variables by using Ordinary Least Squares (OLS) regression method. The findings show that number of revenue streams, tenure, size, and managerial competence have positive influence on reducing financial vulnerability of Youth NGOs.

Keywords Financial vulnerability · Hirschman–Herfindahl Index (HHI) · Revenue concentration · Revenue diversification · NGOs

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1 Introduction

In many countries, Non-Governmental Organizations (NGOs) play predominant role in social areas as a third sector in areas where public and private sectors fail to provide social services for people in need (Ayhan and Önder 2017; Banks and Hulme 2012; Brass 2012; Burger and Owens 2009; Despard et al. 2017; Lewis and Kanji 2009; Önder et al. 2019; Önder 2006). In this sense, NGOs should provide sustainable and continuous social services for high-need communities (Önder and Ayhan 2017). Profit-seeking organizations aim to obtain profit and market share while NGOs intend to achieve their social mission and organizational goals to provide social goods and services for people in need (Fowler 2000; Gronbjerg 1993; Hackler and Saxton 2007; Mitchell 2014). Like profit-seeking organizations, NGOs also need financial resources to pursue their social missions. Therefore, social mission and organizational goals are directly related to financial capacity of NGOs (Sontag-Padilla et al. 2012, p. 2).

Financial capacity is essential for NGOs to improve their activities, pursue their missions and react to opportunities, crises, and threats. Therefore, NGO managers concern about fund raising and reallocating financial resources to sustain organizational activities (Sontag-Padilla et al. 2012, p. 2). Moreover, public institutions and nonpublic organizations supporting NGOs have also interest on building and strengthening the financial capacity of NGOs, because NGOs fill the gap in social areas where public and private sectors fall short in providing social goods and services for people in need. For instance, there were around 1.41 million NGOs officially registered in the USA, and these NGOs contributed approximately \$905.9 billion dollars to the US economy, which is equal to 5.4% of the Gross Domestic Product (GDP) of the USA in 2013. In 2011, it is estimated that 62.8 million adults, which is equal to 25.3% of the US population, volunteered at least once (Urban Institute 2015, pp. 1–11). Therefore, financial capacity is very pivotal for NGOs to sustain organizational functions in the long run. Financial capacity of NGOs needs to be dynamic against sudden shocks, crises, and threats in order to continue providing services.

NGOs use several revenue streams (e.g., membership fees, donations, governmental subsidies, grants, project income, and other fund-raising activities) to pursue their social mission and organizational goals. However, some NGOs are not able to ensure sustainability and diversity of their revenue streams, which are vulnerable to external and internal challenges. Moreover, NGOs operate with “ambitious goals, uncertain technologies, and unpredictable environments.” Therefore, it is questionable whether current financial capacity of NGOs is adequate to resist these challenges in delivering social service for the citizens (Watkins et al. 2012, p. 288).

Many researchers argue that dependence on less number of revenue streams causes uncertainty for NGOs (Despard et al. 2017; Hudock 1995; Watkins et al. 2012), threatens their financial autonomy (Banks and Hulme 2012; Elbers and Schulpen 2013; Wallace et al. 2006), and results in financial vulnerability (Tuckman and Chang 1991). Therefore, revenue concentration on less number of sources might

result in the failure of social mission and organizational goals (Gronbjerg 1993; Pfeffer and Salancik 1978; Hillman et al. 2009; Froelich 1999). In this sense, NGOs should aim to expand financial capacity by diversifying their revenue streams (Fowler 2000; Mitchell 2014), and avoid the revenue concentration on few revenue streams (Frumkin and Keating 2011; Keating et al. 2005).

This study provides an empirical analysis for the question of “What accounts for the financial vulnerability of NGOs in Turkey?” with the case of Youth NGOs in Southeast Anatolia Region ($n = 103$) and Mediterranean Region ($n = 100$). OLS regression method was used in order to find out relationships between dependent variable of financial vulnerability and independent variables of number of revenue streams, tenure, size, and managerial competence. In this sense, the study offers a unique contribution to the literature, because there is not a single comparative study concerning financial vulnerability of NGOs in different regions of Turkey. Therefore, the study fills the gap in the civil society literature in Turkey, and it is expected to contribute to future research.

2 Data and Methodology

2.1 Data

This research seeks explanations for the question of “What accounts for financial vulnerability of NGOs?”. In order to answer this question, primary data was gathered from a semi-structured and detailed survey among the representatives of Youth NGOs ($n = 203$). These NGOs were contacted through a project supported by Turkish Ministry of Youth and Sports, namely “Project for Cooperation with Non-Governmental Organizations (NGOs)” between 2017 and 2018. The Ministry of Youth and Sports has a database, which lists NGOs operating in the area of youth, education, and research. These Youth NGOs were invited to attend 5 workshops that are organized in both Southeast Anatolia Region (3 one-day workshops) and Mediterranean Region (2 one-day workshops).

These regions were chosen due to some specific reasons. Firstly, Mediterranean Region represents the characteristics of Western and Northern Regions of Turkey, while Southeast Anatolia resembles East and Northeast Regions of Turkey. Therefore, the generalizability of findings from both regions can be used for a large area of Turkey. Secondly, both regions have very unique features such as the level of socioeconomic development and other social factors. For instance, Southeast Anatolia Region constitutes mainly Kurdish-speaking citizens, and it is an emigrant region. On the other hand, as a coastal region, Mediterranean Region has multicultural structure, and it is a migrant receiving region due to its tourism potential, living standards, and other socioeconomic incentives. Finally, there are security issues in the Southeast Anatolia Region because of the internal and external terrorism on its border with Syria and Iraq. On the contrary, Mediterranean Region can be considered as a safe heaven for people against terrorism.

2.2 Methodology

The data used in this study were gathered from the responses to 280-items survey. These items were determined by considering their advantages and disadvantages and borrowed from different studies in the literature. There are too many variables to make an in-depth analysis of current situation, problems, experiences, and needs of NGOs. However, only related items for financial vulnerability and financial resources of NGOs are used in this study. There is also additional data gathered from interviews and observations during 5 one-day workshops with Youth NGOs organized by Turkish Ministry of Youth and Sports as a project.

2.2.1 Dependent Variable

Financial vulnerability is the single dependent variable of the study, and this variable has one main indicator: revenue concentration. This indicator was measured by revenue concentration index of Tuckman and Chang (1991) that is similar to Hirschman–Herfindahl Index (HHI). The results of calculations for revenue concentration were used to test factors that influence financial vulnerability of Youth NGOs in Southeast and Mediterranean Regions.

2.2.2 Independent Variables

In the literature, there are many studies seeking to find out relationships between revenue concentration and financial vulnerability by different indexes like revenue concentration index that was introduced by Tuckman and Chang, or HHI (Chikoto et al. 2015; Despard et al. 2017; Gronbjerg 1993; Hudock 1995; Tuckman and Chang 1991; Watkins et al. 2012). Therefore, number of revenue streams is used as the main independent variable in this study. In order to measure financial concentration, NGOs with revenue from single sources are considered to have revenue concentration index of one (1.00), while NGOs with equally divided revenues from diverse sources are considered to have revenue concentration index of zero (0.00).

In this study, the following main hypothesis about financial vulnerability of NGOs in the literature has been tested (AbouAssi 2013; Despard et al. 2017; Elbers and Arts 2011; Fowler 2000; Gronbjerg 1993; Mitchell 2014; Önder 2006):

Hypothesis 1 “Dependence on less number of revenue streams increases financial vulnerability of NGOs.”

There are some other independent variables influencing financial and organizational capacity of the NGOs: tenure, size, and managerial competence of NGOs. Tenure indicates how long an NGO has been operating. It is calculated by subtracting establishment year of the organization from 2018 (Tenure = 2018 – year of establishment). The tenure was separately coded as “1” to indicate 1–5 years,

“2” to indicate 6–10 years, “3” to indicate 11–15 years, and finally “4” to indicate 16 years and more in the descriptive statistics. However, these scale values were not used in the regression model. We assumed that older NGOs are durable and sustainable so they might have less financial vulnerability. Hence:

Hypothesis 2 “Older NGOs are expected to have less financial vulnerability.”

On the other hand, size indicates the number of paid personnel and estimated annual budget as variables. We approximated the number of paid personnel by using quartiles to create ordinal level data. The number of paid personnel was separately coded as “0” to indicate NGOs with no personnel, “1” to indicate from 1 to 5 personnel, and finally “2” to indicate six or more personnel both in the regression model and descriptive statistics. On the other hand, estimated annual budget in Turkish Lira (TL) was separately coded as “1” to indicate 0–49,999.00 TL, “2” to indicate 50,000.00–99,999.00 TL, “3” to indicate 100,000.00–149,999.00 TL, and finally “4” to indicate 150,000.00 TL and more for descriptive purposes but scale values were not used in the regression model. Chikoto-Schultz and Neely (2016), for instance, found that organizational age of NGOs and the number of paid personnel influences the ability to diversify revenue sources and financial vulnerability of NGOs. Similarly, Burde et al. (2016) argue that both tenure and size are closely related with funding instability and organizational survival of NGOs in the case of Israel. Finally, Silva and Burger (2015) also uses the number of personnel in NGOs to measure financial vulnerability of NGOs in the Uganda.

Hypothesis 3 “Larger NGOs in size are expected to have less financial vulnerability.”

Finally, there are studies that evaluate the influence of managerial competence on financial vulnerability of NGOs (Önder 2006; Tuckman and Chang 1991; Sontag-Padilla et al. 2012), because experienced and qualified managers can reallocate financial resources efficiently; pursue organization’s mission and goals; react to opportunities, crises, and threats effectively; and increase fund-raising activities (Önder and Köylü 2018; Sontag-Padilla et al. 2012). Managerial competence indicates the total years of experience of NGO managers (including both voluntary and paid). In order to calculate total years of experience, paid, and voluntary experiences were standardized as variables, and then total experience was calculated by summing up these variables. The number of total years of experience was separately coded as “1” to indicate 1–5 years, “2” to indicate 6–10 years, “3” to indicate 11–15 years, and finally “4” to indicate 16 years and more for descriptive purpose. However, these scales were also not used in the regression model.

Hypothesis 4 “NGOs with higher managerial competence are expected to have less financial vulnerability.”

2.2.3 Revenue Concentration Index

Scholars use different types and number of revenue streams in their studies such as donor funding from international agencies, funding from public institutions, individual voluntary donations, membership fees, corporations, foundations, funding from public institutions, interest and savings, revenue from contracts, gifts, income generating activities, and rental income (Gronbjerg 1993; Despard et al. 2017; Hodge and Piccolo 2005; Macedo and Carlos Pinho 2006; Silva and Burger 2015; Chikoto et al. 2015; Önder 2006; Tuckman and Chang 1991). In this study, 7 types of revenue streams are used depending on the data available because there is not a database for different types of revenue sources in Turkey. These streams are income generating activities, membership fees, individual donations, funding from central public institutions, funding from local public institutions, funding from national organizations, and funding from international organizations. The data about these revenue streams is gathered from the semi-structured and detailed survey among the representatives of Youth NGOs ($n = 203$), and discussions and observations during 5 one-day workshops organized by Turkish Ministry of Youth and Sports between November 2017 and April 2018.

Seven revenue streams of the study are evaluated to find out revenue concentration of Youth NGOs in different regions by revenue concentration index that was developed by Tuckman and Chang (1991). In this method, NGOs with revenue concentration index of one (1.00) are considered to have lower level of revenue diversification, while NGOs with revenue concentration index of zero (0.00) are considered to have higher revenue diversification. The revenue concentration index was calculated by summing the squares of the proportions of total revenue that each revenue stream represents (Önder 2006, p. 55):

$$RCI = \left[\left(\frac{R_1}{100} \right)^2 + \left(\frac{R_2}{100} \right)^2 + \dots + \left(\frac{R_7}{100} \right)^2 \right] \quad (1)$$

In this formula, R is the percentage share of each revenue stream in total revenue of each CSO.

2.2.4 The Multiple Regression Model

Financial vulnerability as a dependent variable has one measurable indicator, revenue concentration. This indicator was operationalized by revenue concentration index that is similar to Hirschman–Herfindahl Index (HHI). The results of calculations were coded to test possible interactions and relations between dependent variable and independent variables by using Ordinary Least Squares (OLS) regression method. The findings show that number of revenue streams, tenure, size, and managerial competence have positive influence on reducing financial vulnerability of Youth NGOs.

OLS regression was selected for two reasons (Farah et al. 2018, p. 25; Önder 2006). Firstly, it is a widely accepted statistical procedure for exploring and predicting the relationships among different variables. Second, the results of regression are easy to interpret. Regression runs with variables against each criterion variable and the results are reported in the findings. The OLS regression model used the following variables:

$$y = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \beta_4x_4 + \varepsilon \quad (2)$$

where

$\beta_0 \dots \beta_n$ are coefficients,

y = financial vulnerability,

x_1 = number of revenue streams,

x_2 = tenure,

x_3 = size,

x_4 = managerial competence,

ε = error term.

Multiple regression outputs were illustrated in Table 5 in the following part of the study.

3 The Findings and Discussions

The survey was applied to NGO representatives with different positions and responsibilities. Most of the respondents from Southeast Anatolia Region were youth representatives (33%), senior managers (29.1%), and executive directors (24.3%). There were also members (7.8%) and provincial representatives (5.8%). Similarly, the distribution of NGO representatives in the Mediterranean Region is as follows: executive directors (30%), senior managers (30%), youth representatives (28%), provincial representatives (6%), and members (6%).

Table 1 displays sample description of the study indicating independent variables that are considered to have an influence on financial vulnerability of Youth NGOs in Southeast Anatolia and Mediterranean Regions. Average number of revenue streams of the Youth NGOs was calculated as 3.54 in the Southeast Anatolia Region, while this number was equal to 2.67 in the Mediterranean Region. On the other hand, average of tenure was calculated as 12.51 in the Southeast Anatolia Region, while this number was calculated as 13.89 in the Mediterranean Region. In other words, Youth NGOs in the Southeast Anatolia Region are older than Youth NGOs in the Mediterranean Region. However, it was observed that most of the Youth NGOs in both regions were established after the year 2000, so they are not considered as old organizations in terms of tenure.

About 50% of the Youth NGOs in both regions have no paid personnel. It can be claimed that NGOs are mainly based on voluntary activities of volunteers, but paid

Table 1 Study sample description

Variables	TRC Southeast Anatolia Region (<i>n</i> = 103) % or mean (SD)	TR6 Mediterranean Region (<i>n</i> = 100) % or mean (SD)	Full sample (<i>n</i> = 203) % or mean (SD)
Number of revenue streams	3.54 (2.04)	2.67 (1.08)	3.11 (1.69)
Tenure	12.51 (12.77)	13.90 (16.04)	13.19 (14.45)
Size			
Number of paid personnel			
None	54.4	45	49.8
1–5	37.8	43	40.4
More than 6	7.8	12	9.8
Total	100	100	100
Estimated annual budget (TL)			
0–49,999.00	15.5	20	17.7
50,000.00–99,999.00	26.2	15	20.7
100,000.00–149,999.00	23.3	22	22.7
More than 150,000.00	35	43	38.9
Total	100	100	100
Managerial competence			
Total years of experience (years)			
1–5	26.2	25	25.6
6–10	30.2	22	26.1
11–15	18.4	22	20.2
More than 16	25.2	31	28.1
Total	100	100	100

Source: Survey data

personnel is also essential for professionalization of NGOs. Similarly, almost 43% of the representatives of Youth NGOs in Mediterranean Region claimed that they have from 1 to 5 paid personnel while this rate is about 37.8% in the Southeast Anatolia Region. Only about 7.8% of the NGOs in Southeast Anatolia Region have 6 and more paid personnel, while 12% of the NGOs in the Mediterranean Region have 6 and more personnel. Therefore, most of the Youth NGOs in both regions are not considered as large organizations in terms of number of paid personnel.

Youth NGOs in Southeast Anatolia and Mediterranean Regions have similar characteristics in terms of the estimated annual budget. The range of estimated annual budget changes between 10,000.00 TL and 1000,000.00 TL. About 40% of the Youth NGOs in both regions have less than 100,000.00 TL of estimated annual budget. The rest of the Youth NGOs have an estimated annual budget of 100,000.00 TL and more. However, it is important to note that only 35% of the NGOs in the Southeast Region have 150,000.00 TL and more estimated annual budget, while this

rate is 43% in the Mediterranean Anatolia Region. As a result, most of the NGOs in both regions are not considered as large organizations in terms of estimated annual budget.

Managerial competence of Youth NGOs in both regions is measured by the indicator of total years of experience (paid and voluntary) of the managers. The frequency analysis of the full sample shows that about 50% of the managers have 1 to 10 years of experience in NGOs, while rest of the managers have 11 years and more. Managers of Youth NGOs in Mediterranean Region seem to have more experience than managers in Southeast Anatolia Region. But still, almost half of the managers in both regions have total experience of 10 years and more. As a consequence, Youth NGOs in both regions have experienced managers to pursue their organizational goals and social mission.

3.1 Revenue Concentration of Youth NGOs

Revenue concentration is the main indicator of the dependent variable of financial vulnerability in this study. To measure revenue concentration; firstly, the number of revenue streams used by NGOs in Southeast Anatolia and Mediterranean Regions is analyzed. Secondly, the number of revenue streams was operationalized by using revenue concentration index that is similar Hirschman–Herfindahl Index (HHI) in order to find out revenue diversification of these NGOs. Thirdly, NGOs with revenue from single revenue streams were considered to have revenue concentration index of one (1.00), while NGOs with equally divided revenue streams were considered to have revenue concentration index of zero (0.00). In this sense, NGOs with revenue concentration between 0.00 and 0.50 are considered financially less vulnerable, while NGOs revenue concentration 0.51 and 1.00 are considered financially more vulnerable.

Table 2 shows that 27.2% of Youth NGOs in the Southeast Anatolia Region have 5 and more revenue streams, while only 6% of Youth NGOs in the Mediterranean Region have 5 and more revenue streams. Youth NGOs in the Mediterranean Region are considered to be concentrated on less number of revenue streams. On the other hand, Youth NGOs in the Southeast Anatolia Region are considered to have equally divided revenue streams. In other words, Youth NGOs in the Southeast Anatolia Region are estimated to be financially less vulnerable than Youth NGOs in the Mediterranean Region.

3.2 Revenue Types of Youth NGOs

Table 3 indicates that Youth NGOs in both regions are mainly using revenue streams of membership fees and individual donations, because frequency statistics are concentrated on these streams. Statistical results also show that revenue streams of

Table 2 Percentages of the number of revenue streams of youth NGOs (%)

Number of revenue streams	TRC Southeast Anatolia Region (n = 103)	TR6 Mediterranean Region (n = 100)	Full sample (n = 203)
1	11.7	7	9.4
2	32	46	38.9
3	15.5	29	22.2
4	13.6	12	12.8
5	2.9	4	3.4
6	6.8	1	3.9
7	17.5	1	9.4
Total	100	100	100

Source: Survey data

Table 3 Percentages of revenue types of youth NGOs (%)

Variable	TRC Southeast Anatolian Region (n = 103)	TR6 Mediterranean Region (n = 100)	Full sample (n = 203)
Revenue streams			
Income-generating activities	28.2	18	23.2
Membership fees	94.2	88	91.1
Funding from central public inst.	50.5	27	38.9
Funding from local public inst.	44.7	27	36
Individual donations	81.6	88	84.7
Funding from national org.	29.1	11	20.2
Funding from inter-national org.	26.2	6	16.3

Source: Survey data

NGOs in the Southeast Anatolia Region are more diversified than revenue streams of NGOs in the Mediterranean Region. For instance, 26.2% of the NGOs in the Southeast Anatolia Region claimed that they use revenue stream of international organizations, while this rate is only about 6% for NGOs in the Mediterranean Region. Therefore, NGOs in Southeast Anatolia Region can be considered as more successful in diversifying their financial resources. However, descriptive statistics do not completely explain the financial vulnerability of the Youth NGOs in both regions. Therefore, detailed analysis of the relations between dependent variable of financial vulnerability and independent variables of number of revenue streams, tenure, size (number of paid personnel and estimated annual budget), and managerial competence (sum of voluntary and paid experience of NGO managers) are given in Table 4.

Table 4 Percentages of financial vulnerability of youth NGOs (%)

Variables	TRC Southeast Anatolia Region (<i>n</i> = 103)	TR6 Mediterranean Region (<i>n</i> = 100)	Full sample (<i>n</i> = 203)
Financially vulnerable	57.3	82	69.5
By number of revenue streams			
1	11.7	7	9.4
2	32	45	38.4
3	10.7	22	16.3
4	2.9	8	5.4
5	–	–	–
6	–	–	–
7	–	–	–
By tenure (years)			
1–5	16.5	25	20.7
6–10	15.5	23	19.2
11–15	12.6	17	14.8
More than 16	12.6	17	14.8
Size			
Number of paid personnel			
None	34	37	35.5
1–5	20.4	37	28.6
More than 6	2.8	8	5.4
Estimated annual budget (TL)			
0–49,999	9.7	17	13.3
50,000–99,999	16.5	11	13.8
100,000–149,999	12.6	22	17.2
More than 150,000	18.4	32	25.1
Managerial competence			
Total years of experience (years)			
1–5	16.5	18	17.2
6–10	17.5	17	17.2
11–15	8.6	19	13.8
More than 16	14.6	28	21.2

Source: Survey data

3.3 Financial Vulnerability of Youth NGOs

Operationalization of revenue concentration eases to find out the situation of financial vulnerability of Youth NGOs in the Southeast Anatolia and Mediterranean Regions. NGOs with revenue concentration between 0.00 and 0.50 are

considered financially less vulnerable, while NGOs revenue concentration between 0.51 and 1.00 are considered financially more vulnerable. Therefore, financially less vulnerable NGOs were coded as “0” while financially vulnerable NGOs were coded as “1.” After this, a crosstab statistical classification was made between dependent variable of financial vulnerability and independent variables.

Table 4 indicates that financial vulnerability of Youth NGOs in the Mediterranean Region (82%) is higher than financial vulnerability of the Youth NGOs in Southeast Anatolia Region (57.2%). Firstly, data on the table support hypothesis 1, because financial vulnerability of Youth NGOs in both regions decreases when the number of revenue stream increases. For instance, NGOs using 4 or more number of revenue streams are not financially vulnerable, while NGOs with 4 and less number of revenue streams are financially vulnerable. Therefore, the number of revenue streams has a significant influence on financial vulnerability of Youth NGOs in both regions.

Secondly, data on the table support hypothesis 2, because financial vulnerability of Youth NGOs in both regions decreases when tenure of organizations increases. In Southeast Anatolia Region, 16.5% of Youth NGOs with the age of 1–5 years are financially vulnerable, while this rate is about 12.6 for NGOs with the age of 11–15 years. Similarly, 25% of Youth NGOs with the age of 1–5 years in Mediterranean Region are financially vulnerable, while this rate is 17% for NGOs with the age of 11 to 15 years. Consequently, tenure has a considerable influence on financial vulnerability of Youth NGOs in both regions.

Thirdly, data on the table partly supports hypothesis 3. There is a considerable influence of number of paid personnel on financial vulnerability because financial vulnerability of Youth NGOs in both regions decreases when the number of paid personnel increases. Interestingly, the financial vulnerability of Youth NGOs in both regions increases when the estimated annual budget increases. It can be argued that NGOs with higher annual budget might have tendency to have financial vulnerability because they are pursuing more ambitious organizational goals and providing more social goods and services. Data shows that these NGOs might cut back their service offerings in response to revenue losses during financial shocks, and threats. As a result, the number of paid personnel has a considerable influence on financial vulnerability, while there is an inverse relationship between estimated annual budget and financial vulnerability.

Finally, data on the table partly supports hypothesis 4 about the relationship between total years of experience (including both paid and voluntary experiences) and financial vulnerability. In the Southeast Anatolia Region, the financial vulnerability of Youth NGOs falls from 16.5% (1–5 years of experience) to 8.6% (11–15 years of experience), but suddenly it increases to 14.6%. This rate is still less than 16.5% but it was estimated to be less according to the hypothesis of the study. On the other hand, financial vulnerability of Youth NGOs in the Mediterranean Region falls from 18% (1–5 years of experience) to 17% (6–10 years of experience) but it suddenly reaches to 28% (more than 16 years of experience).

3.4 Multiple Regression Analysis

Our dependent variable is the revenue concentration of NGOs, which is the main indicator of financial vulnerability. A multiple regression procedure was performed with our independent variables. As shown in Table 5, regression analysis illustrates that our model significantly predicts revenue concentration of NGOs. $F = 80.96$, $P < 0.01$, R^2 for model is 0.67, Adjusted R^2 is .66. This regression results provide statistically significant relationships with the hypotheses. Adjusted R^2 values suggest that the combination of variables explain approximately 66% of variation in revenue concentration in both regions. The model meets linear regression assumptions. SPSS regression analysis was used to explore any possible statistical problems of heteroskedasticity, nonconstant variance, and autocorrelation. Although our model is significant, we have only found that four of our tested hypotheses had significant relationships with our dependent variable—the revenue concentration. One of the hypotheses did not have significant relationships and it was not supported statistically. However, it revealed relationships in the directions suggested by our hypotheses, even though it was not statistically significant. Two variables revealed a contradicting relationship with the proposed hypotheses but consistent with some recent studies findings about revenue concentration.

Our hypothesis 1 was supported by our model parallel to findings of AbouAssi (2013), Despard, et al. (2017), Elbers and Arts (2011), Fowler (2000), Gronbjerg (1993), and Mitchell (2014). The negative relationship between number of revenue streams and revenue concentration in the hypothesized direction was observed. If the number of revenue streams increases, the vulnerability of NGOs decreases.

Our Hypothesis 2 was also supported by our model parallel to studies of Chikoto-Schultz and Neely (2016), Burde et al. (2016), and Silva and Burger (2015). We

Table 5 Multiple regression estimates for financial vulnerability of youth NGOs

Independent variables	Coefficients ^a B (Std. Error)
(Constant)	0.845 (0.030)
Number of revenue streams	-0.116 (0.006)***
Tenure	-0.001 (0.001)*
Size	
Number of paid personnel	0.033 (0.017)**
Estimated annual budget	-7.779E-8 (0.000)
Managerial competence	
Total years of experience	0.018 (0.009)**

Source: Survey data

Standard errors in parentheses

^aDependent variable: Revenue concentration

Adjusted Pearson R^2 : 0.673, N (Observations): 203

* $p < 0.10$

** $p < 0.05$

*** $p < 0.01$

found a statistically significant result in an expected direction with our independent variable of tenure of NGOs and their vulnerabilities. In other words, as NGOs get older, they become more institutionalized (Önder 2006) and less vulnerable to financial shocks by diversifying their revenue sources.

We used two variables to measure the size of NGOs; as an estimated annual budget and number of paid personnel (Burde et al. 2016; Önder 2011; Silva and Burger 2015). Our Hypothesis 3 was not supported by our model. Even if budget size provides a relationship in expected directions it was not statistically significant. We assumed that there is a positive relationship between number of professional/paid workers in NGOs and revenue diversification, while we expected negative relationship between number of professional/paid workers and financial vulnerability. However, our findings show that NGOs with more personnel still focus on fewer revenue streams. Even NGOs with more personnel seems to have financial vulnerability needs more elaboration and scrutiny.

We expected that managerial experience would help NGOs to get more diversified resources. However, we found that there is a statistical positive relationship between managerial competence and revenue concentration (Önder and Köylü 2018; Tuckman and Chang 1991; Sontag-Padilla et al. 2012). It seems that when managers have more experience they concentrate on fewer revenue sources. Maybe they want to secure their revenue sources by focusing on known ones from a conservative perspective.

4 Conclusion

The factors affecting financial vulnerability of NGOs in Turkey with the case of Youth NGOs in Southeast Anatolia and Mediterranean Regions were analyzed in this study. Based on the data gathered, various indexes were created to test possible interactions and relationships between dependent variable of financial vulnerability and independent variables of number of revenue streams, tenure, size, and managerial competence. Ordinary Least Squares (OLS) regression method was used.

This research aimed to seek explanations for vulnerability of NGOs by focusing financial challenges in terms of revenue concentration. As a result of data analysis, the study firstly proved that the number of revenue streams and financial vulnerability of NGOs are directly related. Secondly, it was found that financial vulnerability of NGOs varies across different regions in Turkey because revenue concentration of Youth NGOs in the Southeast Anatolia Region is lower than those in the Mediterranean Region. In other words, the revenue of the former ones is concentrated on more diverse revenue streams, while the latter ones are less successful in diversifying their revenue sources. We also found significant relations between our dependent variable and other independent variables that are tenure, size, and managerial competence.

There are some limitations that should be acknowledged. Firstly, accessible financial data of NGOs in Turkey is limited, although the activity of NGOs is

high. In this sense, this study also aims to create new data sources accessible to scholars, public institutions, and nonpublic organizations supporting NGOs. Secondly, the number of surveys ($n = 203$) is limited at the city level (10–15 surveys), but it is still high at the regional level (about 100 surveys). Therefore, regional analysis is more accurate than city-based analysis. Thirdly, the results of this study cannot be compared, or capacity measurement indicators cannot be validated by another study, because there has not been made a similar study in Turkey before. Consequently, the results of the study contribute to literature in many aspects, so it can be used as an essential source for policymakers, public institutions, and nonpublic organizations supporting NGOs. Future research might focus on elaborating impacts of budget of NGOs and attitudes of NGO managers in fund-raising and diversifying revenue streams.

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Structural Changes on Polish Housing Market: Has the Market Returned to the Level Before the Crisis?



Barbara Batóg  and Iwona Foryś 

Abstract Housing market in Poland has undergone several development phases and the fundamentals for new investment arouse. The Polish housing market has become a new research area. The aim of the chapter is to answer the question whether individual local markets with the same dynamics have been influenced by individual development factors and whether the structure of investors has changed over time. In the analysis, the multidimensional spatial and temporal data on four kinds of apartments completed in period 1995–2017 in 16 Polish regions (voivodships) were used. The stochastic shift-share analysis SSANOVA was applied in order to find the common pattern and differences between regions and sectors. The study results confirm the hypothesis about spatial diversification of the market. The introduction of housing environment variables to the analysis strengthens the position of those Polish voivodships that have been traditionally thought to be economically the weakest but have strong location potential.

Keywords Housing market · Number of apartments completed · Dynamic shift-share analysis

1 Introduction

The condition of the housing market and the directions of its transformation are the resultant of the housing situation of the society and a reflection of the social and living problems of a given country. Among the factors shaping the housing situation, one can distinguish between structural factors and systemic ones. Systemic factors determine the extent to which particular social groups are able to use the housing resources. However, they mainly affect the housing policy of a given country (Andrzejewski 1977). Their change in 1990 became a stimulus for the development of the Polish real estate market. On the other hand, structural factors, such as the

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level of economic and technical development, the level of wealth of a given society, its cultural aspirations, or demographic factors determine the dynamics of housing needs and general possibilities of meeting them—the size of residential housing and the level of housing standards (Foryś 2008). They are the foundation of the current condition of the housing market in Poland, shaped by long-term, historical socio-economic, and demographic processes. The changes of these factors are relatively slow and they are also spatially diversified.

The development of the Polish housing market was stimulated by legal regulations introducing market principles in the economy. These changes removed formal and legal barriers to the free movement of real estate and encouraged investors to undertake new projects (Foryś and Tarczyńska-Łuniewska 2018). An additional factor was the globalization of economic processes and active participation in the international system of movement of capital, goods, and services, which resulted in the fact that the processes taking place on the Polish housing market are linked with international systems.

This also applies to unfavorable situations on the housing market. Its first symptom is the appearance of a price bubble. The housing bubble on the real estate market is based on artificial and unjustified increase in house prices. As a result, the demand for real estate is also growing. Potential customers, fearing further price increases, decide faster to buy real estate before another growth occurs. After the recent crisis, prices have risen again, which may point to another price bubble. However, markets do not develop at the same pace. Other determinants affect this condition. Therefore, the chapter explores the spatial diversity of the status of local housing markets in Poland. It was examined whether, in recent years, local individual (voivodship) markets had the same dynamics and were influenced by individual development factors. The obtained results allow decision makers to look for ways to support local development, and not only the diagnosis of the domestic market, as presented by many authors investigating price bubbles.

The stochastic shift-share analysis SSANOVA was applied in order to find the common pattern and differences between regions and sectors. The research can contribute to broader studies, especially to those regarding regional markets.

2 The State of the Polish Housing Market in Historical Terms: The Effects Currently

The development specificity of the Polish real estate market is visible mainly in the first years of the market economy, the following years are marked by an increasingly strong correlation of the Polish economy with the global economy, and thus with the mechanisms controlling foreign real estate markets. Since 1990, the Polish residential market has gone through several stages of development that have been described as follows:

- The period of legal and organizational adjustment to the market economy (1990–1997, whereas in the years 1990–1994 was an ownership transformation stage, in the years 1995–1997 a stage of market mechanisms creation, including market institutions).
- The period of adopted solutions verification and pre-accession activities (1998–2004).
- The period of convergence with the European market and international markets (2005–2008).
- The period of deep crisis on the real estate market (2008–2012).
- Improvement of the economic situation and increase of investors' activity on the housing market, supported by governmental housing programs (after 2013).

The adopted development phases are intertwined with the business cycles of the Polish economy and, in connection therewith, with the business cycles on the real estate market. The first years of the Polish economy's return to market principles are characterized by uneven influence of particular variables, which give direction to the development of the housing market. The years 1993–1995 were characterized by an outflow of capital to the securities market, weakness of the money market, oversupply of industrial real estate, privatization of the state housing stock, housing shortages as a result of stopping new investments, and the first wave of foreign capital inflow. Until 2000, the interest rate on housing loans did not encourage households to meet their housing needs on their own. The first decade of the market economy was characterized by strong state intervention on the housing market, mainly in the form of fiscal tools (tax reliefs), which were to encourage investment on the housing market. This effect was achieved in the area of private housing, for lease and to a lesser extent in the area of cooperative housing.

While the years 1990–1998 meant economic growth in the country, the years 1999–2002 meant stagnation of the economy and the first impasse on the housing market. The impulse that stimulated the economy and the housing market in the second half of 2004 were the pre-accession activities related to Poland's accession to the European Union, and first of all the inflow of EU capital. At the same time, Poland's accession to the EU caused an outflow of social capital and increased emigration. Against this background, it should be noted that the development of the housing market is closely linked to social development, in particular to the life cycle of a family and its housing needs (Foryś 2008). It is also connected with the cycle of household financial needs, differentiated at different stages of the household's life (Banks et al. 2004). Bruhn invests expenditure on the purchase of a flat in the group of economically active clients in the life cycle of his financial needs (Bruhn 2003).

The development of the housing market perceived through the prism of new investments is a dynamic process, and the spatial diversity, strength, and direction of their impact are not homogeneous (Becker 1965). Impulses to stimulate local real estate markets come from the global environment, but are also transmitted between local systems. The greater the variety of local systems, the greater the feedback effects. The investment saturation of one real estate market results in increased interest in new locations.

The quantitative and qualitative structures of the undertaken investments also changes over time, correlated with the financial capabilities of investors and purchasers of flats, but also with the preferences of purchasers with respect to the acquired rights to housing. The years 1990–1993 in Poland were dominated by cooperative and private housing. Since 1994, private housing has accounted for more than half of all houses and apartments put into use, as a result of a strong pursuit of ownership (Case and Shiller 1989). The research has shown that before 1990 in spite of the increasing house average prices and falling quality of public housing the relative performance of the public sector of construction was not nevertheless higher than in the private one. The drop in mortgage interest rates strengthens the housing sector (Haughwout et al. 2013), which in the case of the sector of buildings for sale and lease took place in Poland after 2000. On the other hand, since 2002 housing investments in Poland have been a less and less significant percentage of apartments put into use, not exceeding 10%. Of course, structural changes in the effects of residential housing occur not only over time (Berger-Thomson and Ellis 2004) but also in the spatial distribution of each country.

3 Data and Methodology

3.1 Data

The data comes from the database of Statistics Poland (2018) and concerns apartments completed during the period 1995–2017 in 16 Polish voivodeships (regions). The following kinds (sectors) of apartments are examined:

Private construction

Municipal, public building society, and company apartments

Apartments for sale or rent

Housing cooperatives.

3.2 Methodology

The conventional shift-share analysis decomposes total growth in a region in terms of national, industry-mix, and competitive effects. The classic works were provided by Dunn (1960), Esteban-Marquillas (1972) and Arcelus (1984). Usually this method was applied regardless the length of analyzed period and in most cases the results were satisfying. The shift-share analysis was criticized by many authors. One of the reasons of the critics was the possibility of structural changes of the variable under analysis between the first and the last year of the analyzed period that are not taken into account in calculations. Therefore, Barff and Knight (1988) proposed the dynamic shift-share analysis. In their approach, year-to-year shift-share results are

summed for consecutive years. The biggest part of applications of the dynamic shift-share analysis is connected with changes in employment in the sectors and regions of a given country as in the article of Barff and Knight (1988) for New England, Meunier and Mignolet (2005) for Belgium, Blien et al. (2014) for Bavaria, Batóg and Batóg (2010) for Baltic Sea Region Countries.

Other fields of application were presented, for example, by Otsuka (2016)—the analysis of total energy demand changes in the Japanese region, Alavi and Yasin (2000)—the growth in tourist arrivals to four countries in the Middle East (Egypt, Israel, Jordan, and Syria) from six different regions of the world (Africa, Americas, Eastern Asia, Europe, Southern Asia, and Western Asia) or Antczak and Lewandowska-Gwarda (2016) for change in emigration levels in 24 selected European countries.

A different approach was proposed by Berzeg (1978, 1984) and Knudsen (2000). They presented the shift-share method within the context of the analysis of variance (ANOVA). In the chapter, the ANOVA-based shift-share method is used in case of year-to-year growth rates (1).

$$r_{ij} = \frac{x_{ij,t+1} - x_{ij,t}}{x_{ij,t}} \quad (1)$$

where

$x_{ij,t}$ —value of examined variable in the i th sector in the j th region in period t ,
 r_{ij} —growth rate of the i th sector in the j th region between periods t and $t + 1$.

The model applied is given by the Eq. (2).

$$r_{ij} = m + e_i + g_j + \varepsilon_{ij} \quad (2)$$

$$E(\varepsilon_{ij}) = 0, \text{Var}(\varepsilon_{ij}) = \frac{\sigma^2}{z_{ij}}, \sum_{i=1}^K z_{\cdot i} e_i = \sum_{j=1}^R z_{\cdot j} g_j = 0 \quad (3)$$

where

m —total growth rate for all sectors and regions,

e_i —effect of sector i ,

g_j —location effect of region j ,

ε_{ij} —stochastic error term,

R —number of regions,

K —number of sectors,

$z_{\cdot i}$ —shares of sectors in period t ,

$z_{\cdot j}$ —shares of regions in period t .

This model can be viewed as an analysis of the variance two-way layout model without interactions. Because the model (2) represents the estimable stochastic

formulation of shift-share problem, its parameters could be also estimated by means of weighted least square method with additional restrictions (3). Restrictions mean that the weights come from the first (out of two) year. These models allow the decomposition of the variable growth rate in subsequent years including the division into components by sectors and regions with intercept representing the total growth rate for all sectors and regions.

The analysis is conducted for a long period so at the beginning the similarity of structures in consecutive years was computed by means of city block distance divided by two (4), (5). This distance for structures has maximum value 1 and minimum value 0.

$$DR_{t+1,t} = \left(\sum_{j=1}^R |\omega_{j,t+1} - \omega_{j,t}| \right) / 2 \quad (4)$$

where

R —number of regions,

$\omega_{j,t}$ —share of the j th region in period t ,

$\omega_{j,t+1}$ —share of the j th region in period $t + 1$,

$DR_{t+1,t}$ —city block distance between the structures in period t and $t + 1$.

$$DK_{t+1,t} = \left(\sum_{i=1}^K |\omega_{i,t+1} - \omega_{i,t}| \right) / 2 \quad (5)$$

where

K —number of sectors,

$\omega_{i,t}$ —share of the i th sector in period t ,

$\omega_{i,t+1}$ —share of the i th sector in period $t + 1$,

$DK_{t+1,t}$ —city block distance between structures in period t and $t + 1$.

At the end of the considerations, the Ward method of hierarchical grouping (Ward 1963) was applied in order to find groups of regions for which the location effects were similar during the examined period. The distance based on the Pearson correlation coefficient was used.

4 Results

In Fig. 1, total growth rate of number of apartments completed for all sectors and regions in 1995–2017 is presented. In the most analyzed periods growth rate was between -15% and 20% . The very different situation appeared in 2003—growth rate was over 60% because of the termination of investment started 18–24 months

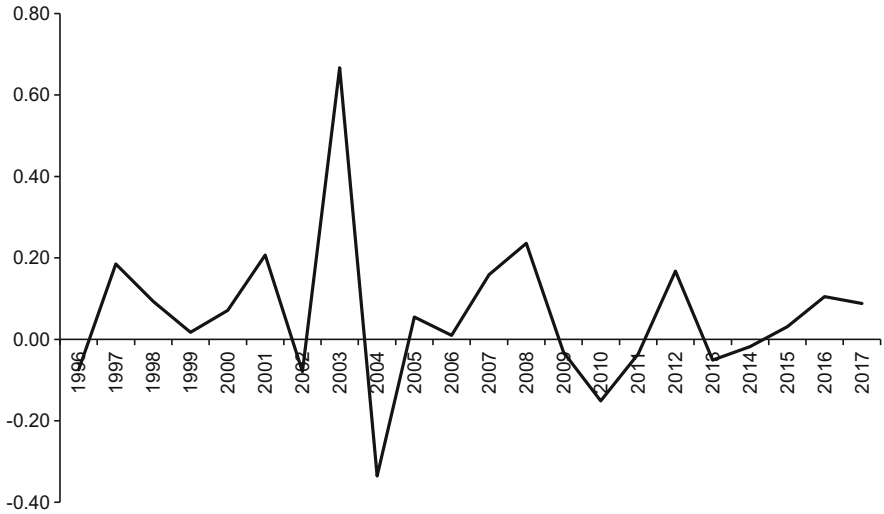


Fig. 1 Total growth rate for all sectors and regions. Source: Own calculations on the base of data from Statistics Poland (2018)

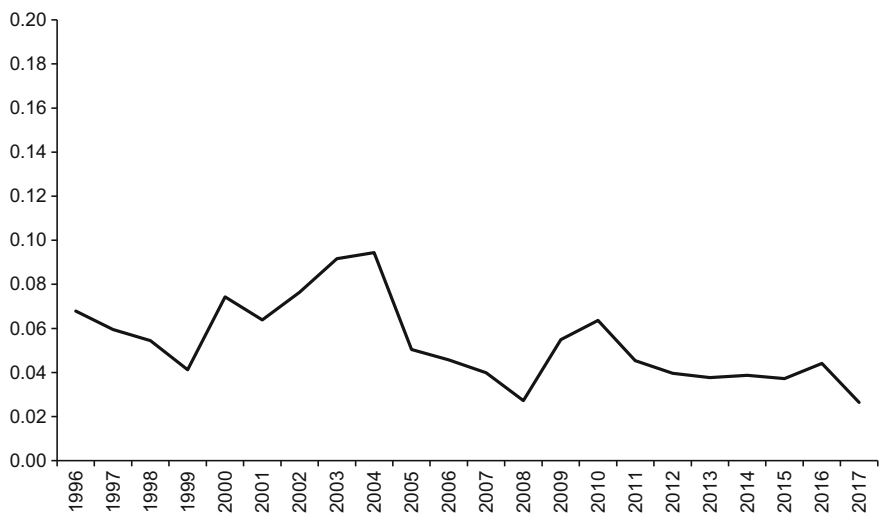


Fig. 2 Year-to-year city block distances between regional structures of apartments (x-axis represents end year). Source: Own calculations based on data from Statistics Poland (2018)

earlier in period of boom on real estate market. After this positive jump in 2003, the big fall occurred in 2004. Almost 40% fall was connected with slowdown in economy in 2002 and anticipation of growth of taxes after accession to the European Union.

In Figs. 2 and 3, year-to-year city block distances between structures of apartments according to regions and sectors are presented.



Fig. 3 Year-to-year city block distances between sectoral structures of apartments (x-axis represents end year). Source: Own calculations based on data from Statistics Poland (2018)

Looking at the year-to-year distances between regional structures of apartments one can observe that the changes were quite small—all distances were less than 0.1 with 1 as biggest possible value. The highest values appeared in two cases: for distances between regional structures in 2002 and 2003 and also between regional structures in 2003 and 2004—years short after slowdown in economy in 2002. In 2005–2008, these distances diminished and in 2009 and 2010 increased but this increase was lower than in 2003 and 2004. Therefore, the crisis in 2008 had smaller impact on regional structures than the slowdown in 2002.

In the case of distances between sectoral structures of apartments the situation was different in 2002, 2003, and 2004. The distances regarding these years were much bigger (about 15%) than for regional structures. This high jump was caused by shifts in the number of individual apartments completed. The number of individual apartments completed in 2003 was twice as big as in 2002 and 2004. During the second crisis (2008), the changes in sectoral structures were again quite small. The peak in 2016 was caused by the big increase in the number of apartments completed for sale or rent.

In Fig. 4 the sectoral effects in 1996–2017 (deviations from total growth rate with assumption of constant structure on the level of previous year) are presented.

From Fig. 4 one can conclude that the sectoral effects for apartments in housing cooperatives were negative almost in whole period. It means that growth rates for this kind of apartments completed were smaller than for whole aggregate. This phenomenon was caused by decreasing tendency of number of apartments completed in housing cooperatives. The apartments for sale or rent were at the other

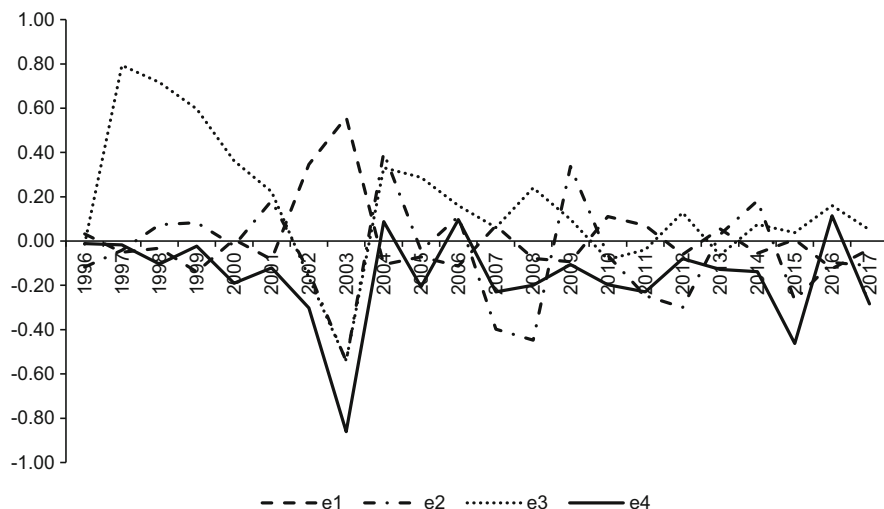


Fig. 4 The sectoral effects in 1996–2017. e1—private construction. e2—municipal, public building society, company apartments. e3—apartments for sale or rent. e4—housing cooperatives. Source: Own calculations based on data from Statistics Poland (2018)

end—growth rates for this kind of apartments completed were bigger than for whole aggregate almost in every year of the examined period. For all kinds of apartments completed, the biggest deviations from growth rate for whole aggregate were in 2002 and 2003. Figure 5a–d present the regional effects in 1996–2017 (deviations from total growth rate with assumption of constant structure on the level of previous year).

It is hard to point out one leading voivodship—none of voivodships had positive value of regional effect in all examined years, including capital voivodship Mazowieckie. The highest number of years with positive regional effects had Śląskie voivodship and the smallest number of years with positive regional effects had Opolskie and Podlaskie voivodships. In 2002 and 2003, the deviations were usually bigger than in other years, which was not the case for 2008. The sectoral and regional effects summed over years are presented in Fig. 6.

From Fig. 6 it could be concluded that the biggest sum of sectoral effects occurred for apartments completed for sale and rent whereas the smallest sum of sectoral effects occurred for apartments completed in housing cooperatives. Among voivodships, the biggest sum of regional effects occurred for Małopolskie, Podkarpackie, and Zachodniopomorskie whereas the smallest sum of sectoral effects occurred for Podlaskie. The Ward dendrogram that groups voivodships according to their regional effects in 1996–2017 is presented in Fig. 7.

On the dendrogram four groups of voivodships are visible:

- Wielkopolskie, Świętokrzyskie, Warmińsko-mazurskie, Podlaskie
- Zachodniopomorskie, Mazowieckie, Lubuskie
- Pomorskie, Śląskie, Opolskie, Podkarpackie, Małopolskie
- Lubelskie, Kujawsko-pomorskie, Łódzkie, Dolnośląskie.

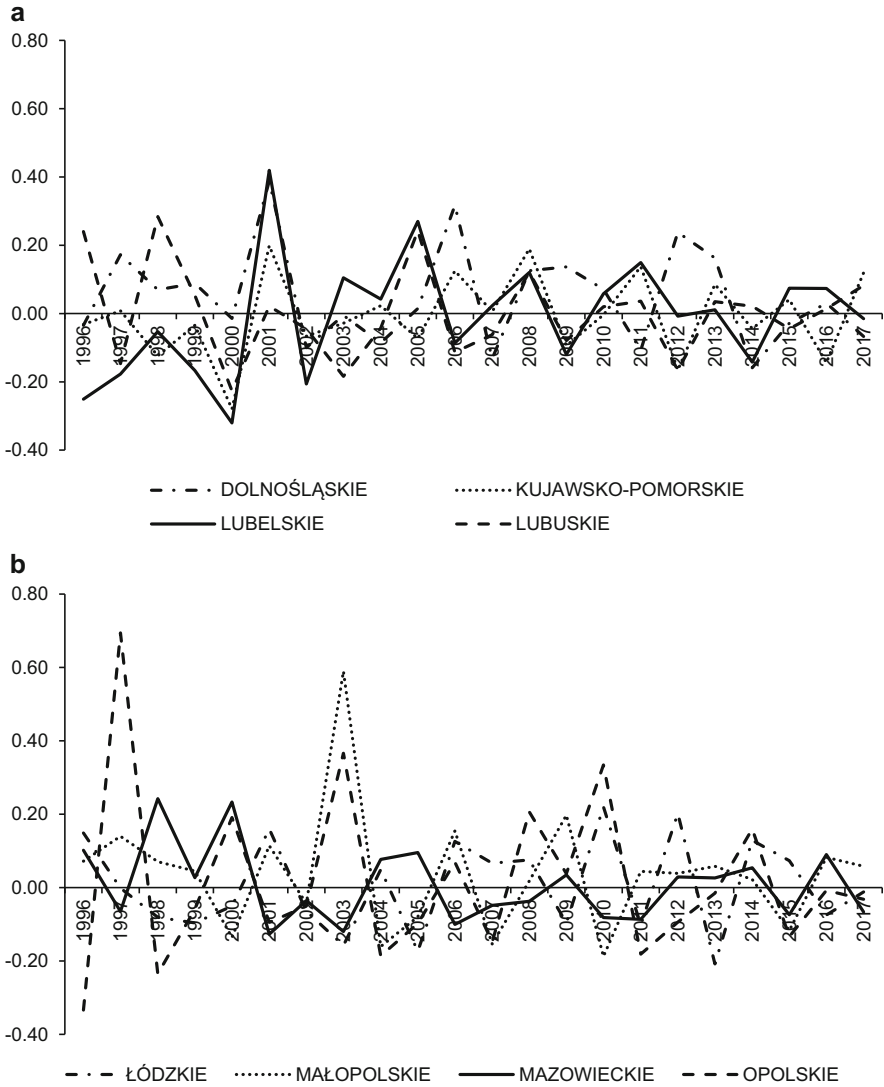


Fig. 5 (a–d) The regional effects in 1996–2017. Source: Own calculations based on data from Statistics Poland (2018)

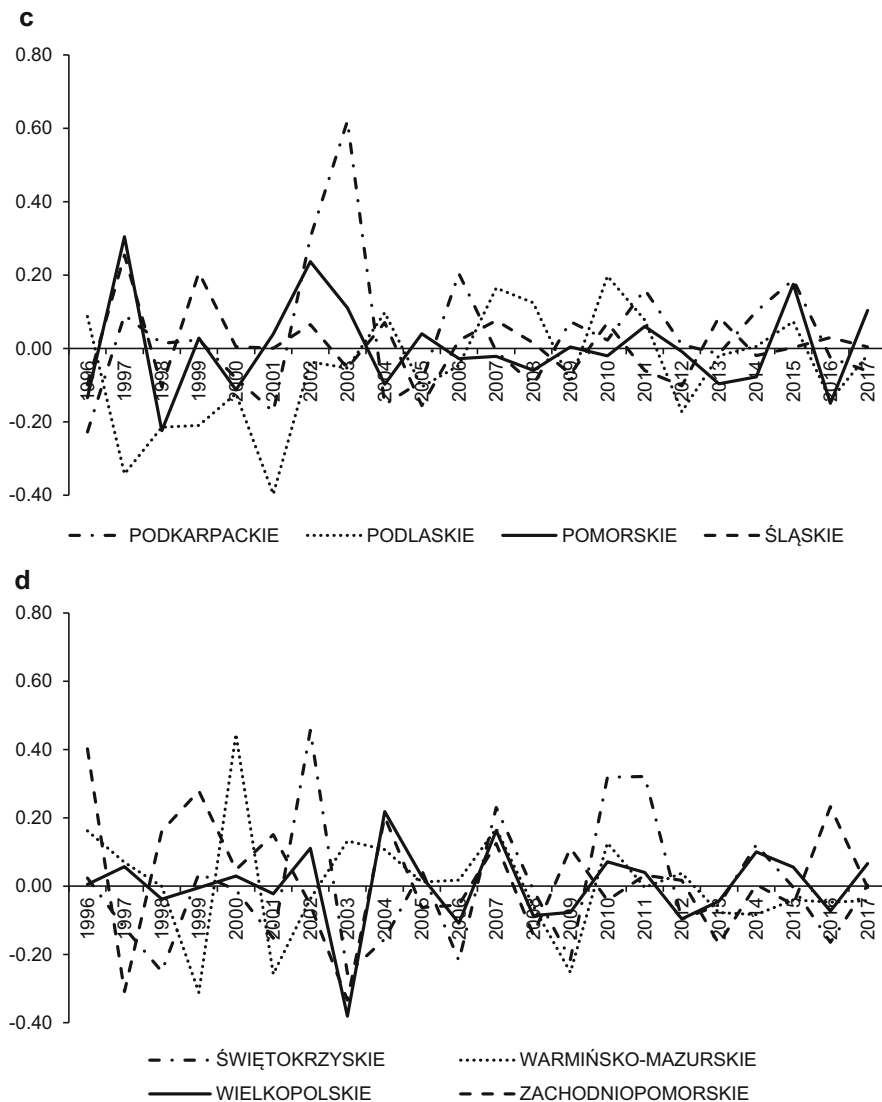


Fig. 5 (continued)

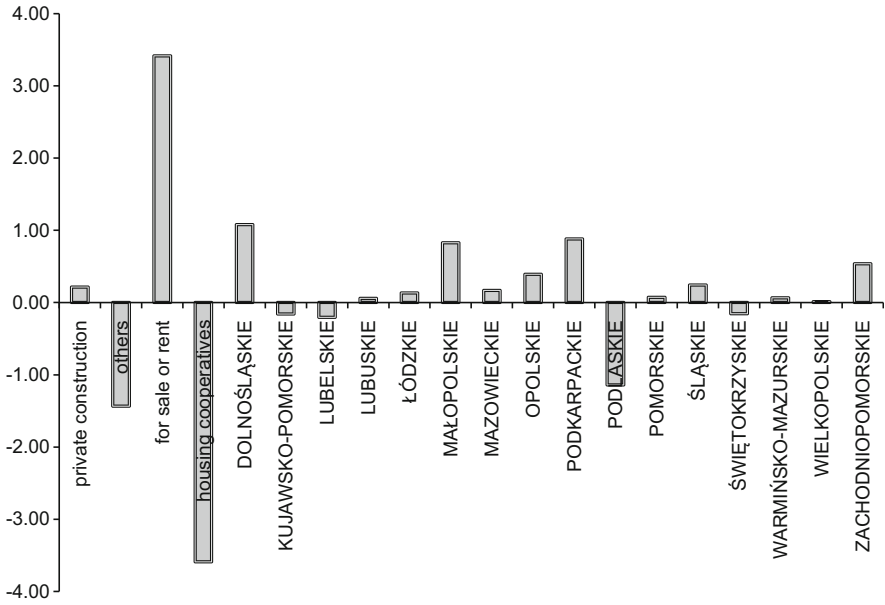


Fig. 6 The sums of sectoral and regional effects (1995–2017). Source: Own calculations based on data from Polish Statistics Poland (2018)

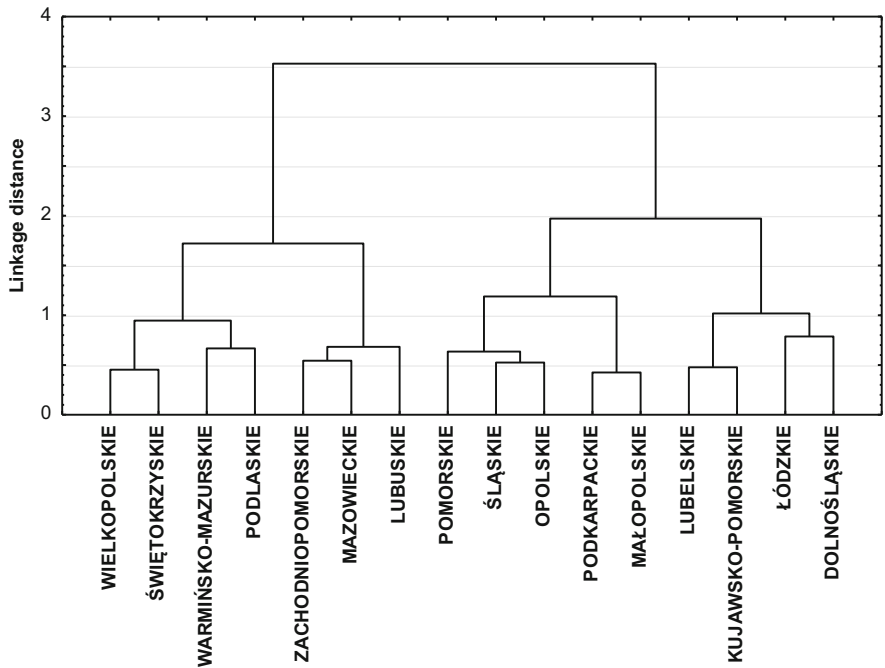


Fig. 7 Ward dendrogram. Source: Own calculations based on data from Statistics Poland (2018)

Within every group temporal pattern for regional effects in 1996–2017 was similar. In the first group, the greatest absolute regional effects were observed in the completely examined period. In the second group, the effects were the lowest, especially after the crisis in 2008. The third and fourth groups were characterized by a high stability of regional effects since 2002 with no visible changes in the crisis period 2008, but the effects were smaller in the third group than in the fourth. The first group of voivodships is characterized by a high degree of instability in terms of the number of apartments completed. In this group of voivodships, potential buyers cannot predict well the possibility of buying apartments, and local governments should pursue policies more conducive to housing construction.

5 Conclusion

The economic behaviors of businesses are specific for a given time and place as they are a part of a playing field in a specific system where an individual attempts to manipulate in order to achieve their goals (Shiller 2003). The 1990s were characterized by the phenomenon of investment stagnation and continuation of historical tendency in Poland. The structure of the apartments completed was the result of the country division before and after the Second World War. In addition, this effect is also local tradition, particularly in private construction, which is more popular in the southern areas of the country. In 2004, the differences between the forms of buildings were more blurred after the Polish accession to the European Union. After the economic crisis in 2008, greater stabilization of the structure handed over to the use of flats can be seen. As globalization processes proceed, it could be expected that in few years similar forms of housing construction will be typical for most regions of the country.

In such a situation, the role of the market is to provide information and create its participants' individual preferences, expectations, and activities (Dorward et al. 2003). These preferences decided what type of housing construction has dominated in the past and what forms of housing construction will develop in the future. Some authors accepted that homeownership rather than renting law is the preferable path to wealth creation (Di et al. 2007). The study results confirm the hypothesis about spatial diversification of the market. On the base of Ward method four separate groups of voivodships were found. For these groups temporal patterns were similar but not levels of deviations from total growth rate of number of apartments completed. It could be stated that after crisis in 2008, the structure of apartments completed according to regions was stable. The different conclusion could be drawn about sectoral structure of apartments completed. The big shift between kinds of apartments completed has occurred. There is no longer interest of investors in apartments in housing cooperatives. In future work it could be interesting to take into account spatial diversification, i.e., some dependency between neighboring voivodships and apply models with time effect incorporated.

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Part II
Macro Economics

Effect of GDP, Energy Consumption, and Material Consumption on Waste Generation: The Case of EU-28 Countries



Richard Gardiner and Petr Hajek

Abstract Controversy encompassing economic growth and waste generation into the economic system–environmental implication nexus usually jolts many experts, academic elites, policy makers, and others out of belief. This is because hazardous waste has detrimental effect on health and environment. The leading school of thought argues that economic growth creates much waste and thus exacerbates problems with environment. The contribution of waste into the economic system can also be ascribed to increasing material consumption. Hence, this chapter focusses on the causal relationship among economic growth, energy consumption, and material consumption on waste generation. Here we used panel cointegration tests to demonstrate that cointegration is present among total waste, GDP, energy consumption, and material consumption. The results of panel vector error correction models indicate that there is a unidirectional short-run effect running from material consumption to waste generation. In addition, there is a unidirectional long-run Granger causality running from GDP, energy, and material consumption to waste generation into the economic system. However, no short-run causality running from GDP and energy consumption to waste generation was observed. This implies that waste generation will not change even if GDP and energy consumption increase suggesting that the EU-28 countries represent a successful case of waste management.

Keywords Waste generation · Material consumption · Energy · GDP · Causality

1 Introduction

Waste generation has recently been a bane for low, middle, and highly industrialized countries around the globe. Waste has become a burden of industry and communities. However, with the development of economy, increase in material consumption

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as well as changing of attitude and better understanding of global warming has led to identification of waste as a dangerous phenomenon that needs responsible solution. The generation of the waste volume is assuming faster growth than GDP and urbanization. This is because the modern world economic activities strive on resources such as energy, material, land, labor, and capital. Some of these resources have a tendency to generate material residual that finds its way to the environment as environmental pollution or polluting emissions. Conventionally, waste has been there in the olden days before reliable statistics were available. It was in trivial quantity and it decayed by its natural cycle. However, the negative effect of waste emission on environmental and economic system drew much attention only since 2000 (Hoonweg and Bhada-Tata 2012).

Recent studies estimate a rapid increase in global waste emission up to 27 billion tons by 2050 (Karak et al. 2012). Furthermore, the urban centers in the world create about 1.3 billion tons of solid waste. This quantity is likely to accelerate to 2.2 billion by the year 2025, with an estimated cost of 375.5 billion USD to manage it (Hoonweg and Bhada-Tata 2012). The waste is basically generated by activities such as manufacturing, construction water supply, and energy.

The EU, as a key global region, has not been exempted from the problems related to waste emission as the EU-28 countries press on for economic growth. Waste generation and its environmental repercussions have been considered as the cause of fundamental social and economic problems. The inimical effect of waste generation results in pollution; greenhouse emission, and damage the quality of production resources. Particularly, soil, water as well as air and their remediation involve a high cost. The nexus between waste generation and economic growth represents a critical issue because of its accompanied economic and environmental costs. The waste is largely created by manufacturing and construction industries. Waste (specifically, hazardous waste) has a lot of important consequences in the EU-28 countries. It is regarded to be a cause of grave diseases, such as neurological disorders (Chatham-Stephens et al. 2014) or cancer (Matoloni et al. 2016). There is also a resurface of new waste (hi-tech products), which is made up of a complex mixture of materials, including the hazardous one. It is also expedient to ensure that the planet resources (air, water, land, etc.) are exploited in a judicious way so that they will be sustained for the unborn generation.

The past decade has seen an increased interest in investigating causalities among energy consumption, economic growth, and environment (Ozturk 2010; Dogan and Aslan 2017). However, previous studies have mostly examined the environment component in terms of air pollution. Recent evidences suggest that in order to decrease waste generation, identifying the causality of the waste generation from energy and economic growth should be made a priority (Lee et al. 2016). It is generally perceived that an increased domestic material consumption, in the long run, finds its way in the environment as pollution (Chen et al. 2017). Hence, much waste is generated by the economic system as the domestic material consumption rises. This research is set out to examine the validity of that perception. Moreover, prior studies have investigated the economic growth–waste generation relationship only for individual countries (Gardiner and Hajek 2017). However, this may be

associated with bias resulting from the mismatch in spatial scale. Finally, although the relationships among energy consumption, economic growth, and waste generation are important, it has received little attention in the literature. This chapter contributes to the literature by analyzing the short- and long-term dynamics of energy and material consumption, economic growth, and waste generation for a panel of the EU-28 countries. More precisely, this study examines the data for the EU-28 countries for the period 1995–2016. In contrast with previous research that used carbon dioxide emissions as a proxy of environment, we use waste generation, representing a different environmental degradation variable. In this study, short- and long-run Granger causal relations are explored among waste generation and economic growth, energy consumption likewise material consumption. More precisely, we perform a panel vector error correction model (VECM) to study the Granger causalities.

The remainder of this chapter is organized as follows. Section 2 reviews related literature. Section 3 describes the used data. Section 4 provides theoretical background on the used econometric model. Section 5 shows the results of the experiments and the last section concludes this study and suggests its implications.

2 Related Literature

In recent years, there has been an increasing interest in the relationship between energy consumption and economic growth (also known as energy–growth nexus). In fact, recent literature has offered contradictory findings about the nexus, ranging from no causality between energy consumption and economic growth (neutrality hypothesis) to bidirectional (two-way) causality between them (feedback hypothesis) (Ozturk 2010; Dogan and Aslan 2017). Unidirectional causalities running either from energy consumption to economic growth (growth hypothesis) or in the opposite direction (conservation hypothesis) have also empirical support (Dogan 2015). Regarding the previous empirical studies on EU data, the presence of the bidirectional causality is largely supported (Ozturk et al. 2010; Fuinhas and Marques 2012; Dogan and Aslan 2017). In addition, it has been observed that renewable energy consumption has positive impacts on economic growth for new EU member countries (Alper and Oguz 2016).

Another large body of literature extended the above-mentioned relationship to the so-called energy–growth–environment nexus (Say and Yücel 2006; Al-Mulali and Ozturk 2016). Most empirical evidence suggests that both economy growth and energy consumption increase the level of emissions (Dogan and Aslan 2017). Specifically for the EU, Kasman and Duman (2015) investigated the causalities between energy consumption, carbon dioxide emissions, economic growth, and other variables on a panel of EU candidate and member countries for the period 1992–2010. Short-run panel causalities were examined using traditional panel unit root tests, cointegration tests, and causality tests. The results indicate that there exists a short-run unidirectional causality from energy consumption to carbon emissions.

In addition, a long-run causality was observed in carbon dioxide emissions, energy consumption, foreign direct investment, GDP, stock market, and trade openness using estimated coefficients of lagged error correction terms (Bedir and Yilmaz 2016; Asif and Majid 2018; Pradhan 2018). In addition, renewable energy is reported to mitigate carbon dioxide emissions while nonrenewable energy increases the emissions (Dogan and Seker 2016).

Most studies in the energy–growth–environment nexus tended to focus on carbon dioxide emissions. So far, however, far too little attention has been paid to material consumption and waste generation. Jebli and Youssef (2015) used panel cointegration tests and Granger causality tests to investigate the relationship between GDP, combustible renewables, waste consumption, and carbon dioxide emissions for five North African countries over the period 1971–2008. Most importantly, the results indicate short- and long-run unidirectional causalities running from carbon dioxide emissions and combustible renewables and waste consumption to real GDP. A bidirectional causality between economic growth and combustible renewables and waste consumption was observed for the case of Tunisia over the period 1990–2010 (Jebli et al. 2015). For the same country, unidirectional causality was detected running from real GDP, waste consumption, and rail transport to carbon dioxide emissions (Jebli and Belloumi 2017). Lee et al. (2016) used US data over the period 1990–2012 to investigate the Granger causal relationship among GDP, waste generation, and greenhouse gas emissions. On the one hand, no causality between GDP and waste generation was detected. On the other hand, waste generation significantly increased greenhouse gas emissions from the waste sector.

3 Data

The study collects annual time series data from the Eurostat and it covers the period 1995–2016 for EU-28 countries (i.e., the sample size was 616). The economic variables used are the waste generation (measured in the kilograms per capita), GDP (measured in current price thousands of EUR at market price per capita), energy consumption (measured in thousand tons per oil equivalent), and domestic material consumption (measured in tons per capita). The sample of EU-28 countries includes those presented Table 1. Table 1 also shows the mean values of all investigated variables for each country in the sample. All the used variables were measured per capita to ensure comparability.

Table 1 shows that Denmark has the highest level of waste generation whereas Poland has the least among the countries. Luxembourg has the highest GDP per capita, whereas Bulgaria has the lowest one among the countries. Similar results can be observed for energy consumption because these variables are strongly correlated. Regarding material consumption, Finland has the highest mean domestic material consumption while Malta has the least among the countries.

Figure 1 depicts the variations of the mean values of all variables over the period 1995–2016. Average GDP per capita increased over this period in the EU-28

Table 1 Mean values of the variables for EU-28 countries

Country	Waste generation (kg per capita)	GDP (thousands of EUR per capita)	Energy consumption (tons per oil equivalent per capita)	Material consumption (tons per capita)
Austria	566.8	31,695	3.88	22.85
Belgium	459.4	29,708	5.41	14.83
Bulgaria	543.9	3619	2.49	17.13
Croatia	364.7	8094	2.07	11.16
Cyprus	654.8	19,002	3.26	23.47
Czech Republic	305.4	10,992	4.21	17.40
Denmark	707.5	38,917	3.61	22.67
Estonia	380.3	5763	4.24	24.04
Finland	476.9	31,084	6.52	34.89
France	518.7	27,936	4.16	12.92
Germany	616.0	29,578	4.09	16.25
Greece	436.1	16,267	2.56	15.56
Hungary	437.9	7987	2.45	12.34
Ireland	647.7	35,837	3.43	29.31
Italy	511.7	24,370	2.97	12.76
Latvia	323.0	7001	2.00	17.57
Lithuania	410.2	7061	2.46	12.57
Luxembourg	647.4	67,225	8.72	23.45
Malta	565.2	13,850	2.15	9.75
Netherlands	571.7	33,168	4.95	11.60
Poland	301.0	7156	2.50	15.95
Portugal	449.6	14,475	2.33	17.77
Romania	328.8	4406	1.80	16.97
Slovakia	289.9	8604	3.41	12.53
Slovenia	492.8	14,591	3.31	16.77
Spain	547.9	19,691	2.90	14.76
Sweden	447.1	35,667	5.44	21.21
UK	539.6	30,432	3.59	10.65

Source: Eurostat

countries. Figure 1 also indicates that energy and material consumption and waste generation increased until 2008, whereas gradual decrease is obvious from 2009 to 2016.

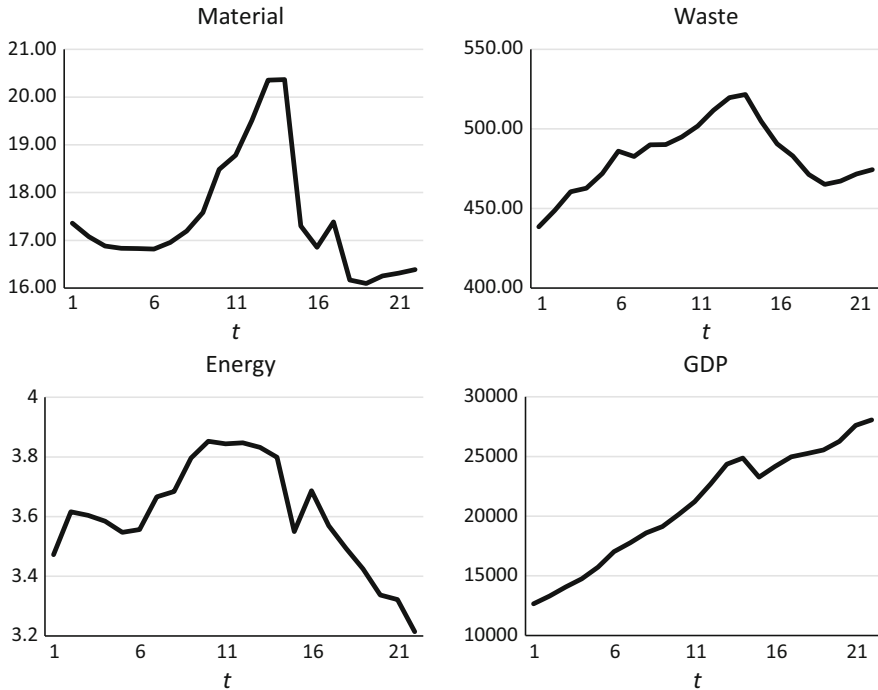


Fig. 1 Mean values of the variables over the period 1995–2016. Source: Authors' own study

4 Econometric Model

Granger causality was tested in the following steps. First, two pretests, namely unit root test and cointegration test, were performed to test for stationarity and cointegration, respectively.

We began to estimate the unit root test in order to determine the stationarity of individual variables. We used the Phillips–Perron test to test the unit root. The series were integrated into the same direction as well as stationarity among their linear combinations levels existed, which implied cointegration. In other words, there was the existence of equilibrium relationship. Apart from domestic material consumption, the rest of the variables had the unit root and therefore are integrated in the same order. Johansen multivariate cointegration test (Johansen 1988) was employed to examine the causal relationships among waste generation and remaining variables.

Vector autoregressive (VAR) model was then estimated. Akaike information criterion (AIC) was used to indicate the lag length for Johansen cointegration test in the next step (Vo et al. 2016). The test depends on error correction model symbolizing VAR model as follows:

$$\begin{aligned} \text{Waste}_{i,t} = & \alpha_{i,t} + \sum_{j=1}^q \pi_{1,t-j} \text{GDP}_{i,t-j} + \sum_{j=1}^q \pi_{2,t-j} \text{Energy}_{i,t-j} \\ & + \sum_{j=1}^q \pi_{3,t-j} \text{Mater}_{i,t-j} + \varepsilon_{i,t}, \end{aligned} \quad (1)$$

where $i = 1, 2, \dots, N$, N is the number of countries, t is time, j is time lag, $j = 1, 2, \dots, q$, $\alpha_{i,t}$ is intercept (constant term), π_{t-j} are regression coefficients, and $\varepsilon_{i,t}$ is serial uncorrelated error term (also known as white noise). By examining the matrix of regression coefficients, the existence of cointegrating relationships among the variables can be detected. Based on the Johansen's cointegration test, if variables are cointegrated, they may have a short- and long-run causality. Since all the variables were cointegrated, we verified the Granger causalities using the VECM in the following models:

$$\begin{aligned} \Delta \text{Waste}_{i,t} = & \alpha_{1,i,t} + \sum_{j=1}^q \beta_{1,1,i,j} \Delta \text{GDP}_{i,t-j} + \sum_{j=1}^q \beta_{1,2,i,j} \Delta \text{Energy}_{i,t-j} \\ & + \sum_{j=1}^q \beta_{1,3,i,j} \Delta \text{Mater}_{i,t-j} + \gamma_{1,i} \text{ECT}_{i,t-1} + \varepsilon_{1,i,t}, \end{aligned} \quad (2)$$

$$\begin{aligned} \Delta \text{GDP}_{i,t} = & \alpha_{2,i,t} + \sum_{j=1}^q \beta_{2,1,i,j} \Delta \text{Waste}_{i,t-j} + \sum_{j=1}^q \beta_{2,2,i,j} \Delta \text{Energy}_{i,t-j} \\ & + \sum_{j=1}^q \beta_{2,3,i,j} \Delta \text{Mater}_{i,t-j} + \gamma_{2,i} \text{ECT}_{i,t-1} + \varepsilon_{2,i,t}, \end{aligned} \quad (3)$$

$$\begin{aligned} \Delta \text{Energy}_{i,t} = & \alpha_{3,i,t} + \sum_{j=1}^q \beta_{3,1,i,j} \Delta \text{GDP}_{i,t-j} + \sum_{j=1}^q \beta_{3,2,i,j} \Delta \text{Waste}_{i,t-j} \\ & + \sum_{j=1}^q \beta_{3,3,i,j} \Delta \text{Mater}_{i,t-j} + \gamma_{3,i} \text{ECT}_{i,t-1} + \varepsilon_{3,i,t}, \end{aligned} \quad (4)$$

$$\begin{aligned} \Delta \text{Mater}_{i,t} = & \alpha_{4,i,t} + \sum_{j=1}^q \beta_{4,1,i,j} \Delta \text{GDP}_{i,t-j} + \sum_{j=1}^q \beta_{4,2,i,j} \Delta \text{Energy}_{i,t-j} \\ & + \sum_{j=1}^q \beta_{4,3,i,j} \Delta \text{Waste}_{i,t-j} + \gamma_{4,i} \text{ECT}_{i,t-1} + \varepsilon_{4,i,t}, \end{aligned} \quad (5)$$

where Δ denotes the first difference of the respective variable, the sums are calculated over q lags, $j = 1, 2, \dots, q$, $\beta_{i,j}$ are regression coefficients, $\text{ECT}_{i,t-1}$ is the error correction term and γ_i denotes the deviation of the dependent variables from the long-run equilibrium, i.e., the long-run relationships were determined by using ECTs. The VECM assumes that if the variables' waste generation GDP, energy consumption, and domestic material consumption are cointegrated, then at least one ETC contains a significantly nonzero negative coefficient. On the other hand, Wald test was used to determine the short-run causalities.

For instance, if we accept the null hypothesis of Eq. (2), it signifies that GDP per capita does not cause Granger waste generation in the short run. On the other hand, if we reject the null hypothesis and accept the alternate hypothesis in Eq. (2), it means that GDP per capita can cause waste generation per capita. All these results were based on the result of p -value at significance level $p = 0.05$. This is applicable to all the used variables.

5 Empirical Results

First, we tested the stationary proprieties of the variables using Phillips–Perron unit root test. More precisely, we tested for the unit root of the variables waste generation, GDP per capita, energy consumption per capita, and domestic material consumption with trend term. The outcome of the Phillips–Perron unit root test is presented in Table 2. The null hypothesis of this test is that there is a unit root, while the alternative hypothesis suggests stationarity of the series. The results suggest that all variables except material consumption were nonstationary at their levels. After the first difference, all variables were stationary.

To detect cointegration effects (long-run relationships) among the used variables, Johansen test was performed. First, it was necessary to determine the optimum lag

Table 2 Phillips-Perron unit root test

Variable	t -statistics	1st difference t -statistics	p -value	1st difference p -value
Waste	-0.680	-23.246	0.422	0.000*
GDP	-1.833	-24.610	0.063	0.000*
Energy	-2.078	-30.199	0.275	0.000*
Material	-23.246	-20.380	0.000*	0.000*

Source: Authors' own study

*Significant at $p = 0.05$

Table 3 Johansen cointegration test

Hypothesized no. of CE(s)	Eigenvalue	Trace stat.	Critical value at $p = 0.05$	p -value
None	0.171	97.060	47.856	0.000*
At most 1	0.050	33.697	29.797	0.017*
At most 2	0.040	16.359	15.495	0.037*
At most 3	0.007	2.434	3.842	0.119

Source: Authors' own study

*Significant at $p = 0.05$ **Table 4** Short-run Granger causality test

	Δ Waste	Δ GDP	Δ Energy	Δ Material
	F stat. (p -value)	F stat. (p -value)	F stat. (p -value)	F stat. (p -value)
Δ Waste		0.270 (0.847)	2.642 (0.049)*	1.449 (0.228)
Δ GDP	0.108 (0.956)		10.682 (0.000)*	0.417 (0.741)
Δ Energy	0.645 (0.587)	20.181 (0.000)*		1.212 (0.305)
Δ Material	5.493 (0.001)*	0.014 (1.000)	0.131 (0.941)	

Source: Authors' own study

*Significant at $p = 0.05$

length. To do so, we used the minimum value of the AIC in the unconstrained VAR model (considering the first difference of the variables as indicated by the Phillip–Perron unit root test). The minimum AIC corresponded to $j = 3$ lag length. Trace test statistics were used to estimate the cointegration ranks of the variables as deterministic trend was assumed. The result of the cointegration test is presented in Table 3. After adjustments, 2090 observations were included.

In the Johansen cointegration test, the null hypothesis refers to no cointegration. The results in Table 3 show that the value of the trace test statistics (97.060) was larger than the critical value (47.856), leading to the rejection of the null hypothesis at $p = 0.05$. This indicates that cointegration exists among GDP, energy, material, and waste generation. In other words, there is a long-run relationship among these variables.

The results of the cointegration test indicated Granger causality, but additional experiments have to be performed to determine the directions and strengths of the relationships. The VECM was employed for this purpose. Specifically, short- and long-run causal relationships among the variables for the EU-28 countries were investigated by using the VECM defined in Eqs. (2) to (5) for $j = 3$. To make sure that the VECMs are robust, the normality of the variables' distributions was first detected. Tables 4 and 5 present the results for short- and long-run Granger causalities, respectively, i.e., two sets of experiments were conducted to estimate the causalities.

The first one was the short-run causality, also known as weak Granger causality. To estimate this causality, the Wald statistics was used. The result of the short-run Granger causality test is presented in Table 4. The result shows that there is an existence of unidirectional short-run Granger causality running from domestic

Table 5 Long-run Granger causality for waste generation

Variable	ECT coef.	<i>p</i> -value
Δ Waste	-0.001	0.036*
Δ GDP	31.800	0.694
Δ Energy	3.421	0.615
Δ Material	0.004	0.368

Source: Authors' own study

*Significant at $p = 0.05$

material consumption to waste generation. In the same scenario, there exists bidirectional Granger causality running between energy consumption and GDP.

In case of the long-run causality testing, we utilized the ECT coefficients in Table 5. Specifically, we tested for the significance of the model presented in Eq. (2), where waste generation represents a dependent variable. The ECT coefficient of Δ Waste was statistically significant at $p = 0.05$ and negative, indicating a unidirectional long-run relationship running from energy consumption, GDP, and domestic material consumption to waste generation.

6 Conclusion

In this study, we investigated causal relationships among waste generation and GDP, energy consumption and domestic material consumption. The inclusion of energy consumption and domestic material consumption were of particular interest. We can conclude that the results indicate long-run causal relationship running from the GDP, energy consumption, and material consumption on waste generation in the EU-28 countries.

The effect of GDP on waste generation was established by Khatib (2011). We found bidirectional causality between GDP and energy consumption, thus supporting the feedback hypothesis (Ozturk 2010; Dogan and Aslan 2017). No short-run causality running from GDP and energy consumption to waste generation was observed. This conforms to the results provided for the USA (Lee et al. 2016), implying that waste generation will not change even if GDP and energy consumption increases. This suggests that the EU can be used, similarly as the USA, as a successful case of waste management.

Besides, we had a confirmation of unidirectional causality running from the material consumption to waste emission in the short run. This result is not that surprising because it conforms those obtained by Chen et al. (2017). The overall results of an effect of running from domestic material consumption to waste generation in the EU-28 countries was valid in both short- and long-run. However, the effects of economic growth and energy consumption on waste generation were not confirmed. Hence, this signifies the role of policies related to sustainable material

consumption. This will curb waste generation as the countries continue to grow economically.

These findings can be explained as follows. A stringent control policy has recently been implemented in all the EU-28 countries. Market instruments, such as pay as you throw or tax policy, have been adopted as prevention, in particular. We suggest that other instruments should be implemented, such as a sustainable market to recycle materials. Funds allocated for waste prevention must be reasonably used so that it can be sufficient to support materials recycled and disposed of. In the same manner, funds and investment should also be directed to the development of appropriate practices, infrastructure, equipment, and services. It will be prudence for the EU-28 countries to work in synergy with the production and manufacturing sectors of their economy to deal with the problem of goods and material so that they can minimize their hazardous content. The proper monitoring of industries and firms activities, such as the use of proper technology and practices, will curtail the adverse effect of waste on the environment.

For future research, we strongly recommend the extension of our model to consider the effects of other economic variables (foreign direct investment and international trade, in particular, see Akalpler and Adil (2017) or Kalaitzi and Cleeve (2018) and environment variables (mainly water and air pollution, see Tao et al. 2008).

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A Comparative Global Overview for Flat-Plate Solar Collectors (FPSCs) in G-7 and G-20 Countries



Hakan Acaroğlu and M. Celalettin Baykul

Abstract This study conducts a comparative global quantitative analysis about solar thermal technological systems for developed and developing countries. Flat-plate solar collectors (FPSCs) supply hot water to a storage tank for use. It also supplies hot fluid at much higher temperatures for industrial processes. So, they are introduced and used in our analysis for getting realistic practical life results. The market structure and the government policies are taken as a reference for the comparison. The G-7 and the G-20 countries; along with the [European Union](#) (EU) are chosen for observing the differences in markets and policy trends of the solar energy systems in the period between 2005 and 2015. A significant convergence is obtained for the developing countries about catching up to the developed ones on a chosen reference. However, there are critical precautions and strategies that the G-20 countries should consider for sustainable improvements on these technological, environmentally friendly, and energy saving systems. Our study aims to figure out and displays these critical and crucial marketing and policy decisions as a guideline for the demand, the supply, and government sector sides of the developing countries. In the application, we measure the effectiveness of those economic policies for each country by creating a policy development index level, which attains the index values numerically referring the induced renewable energy policy.

Keywords Renewable energy · Solar energy · FPSCs · Markets · Policy development index

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1 Introduction

This study implements a comparative global quantitative analysis about FPSCs for developed countries, which are known as the group of G-7 countries; (1) the **UK**, (2) the **USA**, (3) **Canada**, (4) **France**, (5) **Japan**, (6) **Germany**, and (7) **Italy**, and developing countries, which are known as the group of G-20 countries; (1) the **European Union** (EU), (2) the **USA**, (3) the **UK**, (4) **Turkey**, (5) **South Africa**, (6) **Saudi Arabia**, (7) **Russia**, (8) **Mexico**, (9) **South Korea**, (10) **Japan**, (11) **Indonesia**, (12) **India**, (13) **Germany**, (14) **France**, (15) **China**, (16) **Canada**, (17) **Brazil**, (18) **Australia**, (19) **Argentina**, and (20) **Italy**.

The market structure and the government policies on renewable energy are taken as a reference for comparison, and are chosen for observing the differences in markets and policy trends of FPSCs in the period between 2005 and 2015. When we indexed the countries according to given points to their applied renewable energy policy taking China as a reference (or giving the highest point for the reason of the dominant character in FPSCs in the world markets); the indexing is made according to the current applied government policies and based on China, because China is the leading country about total and newly installed capacity of FPSCs. We found that the developing countries such as India, Argentina, Korea Republic, Indonesia, and Mexico ranked as top 10 among 19 G-20 countries. In other words, a significant convergence is obtained for developing countries about catching up to developed ones on a chosen reference. This finding tells us about an economic shift from the center of gravity. According to our study, the direction of this shift is from the G-7 to the G-20 countries. During this study, we try to explain this economical shift with a technological improvement on a device: a FPSC. The motivation of this study is to make a quantitative contribution to the literature with a comparative global renewable energy analysis for FPSCs in G-20 countries. Creating a policy development index and making some economic measurements with this tool support the evidence of an economic shift of the center of gravity. Our study is different from the others with showing this shift by concentrating on the applied renewable energy policies of governments through a technological device FPSC.

2 Theoretical Frame: An Economic Shift of Gravity Center from G-7 Countries to G-20 Countries

At the end of the twentieth century, the economic origin has slightly shifted from the G-7 to the G-20. In the economic sense, China and India with their large national populations emerged as the new center of economic gravity. Both Tables 1 and 2 show some economic indicators (economic size which is calculated by the Gross National Income (GNI) and the standard of living which is calculated by GNI per capita are given both in dollars (\$) at current exchange rates and in terms of Purchasing Power Parity (PPP)) in 2010, and the average yearly growth rates

Table 1 Economic profile of the G-20 in 2010 (Large advanced countries)

Large advanced countries/ area	Population in millions	Gross National Income (GNI) in billions of US dollars	Gross National Income (GNI) at Purchasing Power Parity (PPP) in billion US dollars	Per capita GNI at PPP in dollars	Average yearly growth of real GDP 2000–2010 in percentages
United States	309	14,646	14,636	47,310	1.8
Japan	127	5334	4412	34,610	0.9
Germany	82	3522	3115	38,100	0.9
France	65	2750	2255	34,750	1.3
United Kingdom	62	2377	2231	35,840	1.8
Italy	60	2159	1924	31,810	0.5
Canada	34	1476	1310	38,370	2.0
G-7 (all the above)	739	32,264	29,883	40,369	1.4
Australia	22	1030	823	36,910	3.2
Euro Area (17)	332	12,794	11,400	34,360	1.3
European Union (27)	502	17,361	15,904	31,681	1.5
Advanced in G20	994	39,847	37,085	37,258	1.6
All high income	1127	43,683	42,073	37,317	1.8

Source: The World Bank (2012); Klein and Salvatore (2013)

between 2000 and 2010, of indicated countries and country groups. These adjustments in indicated units give us an opportunity for comparing countries among each other. While Table 1 includes G-7, Euro area, advanced countries in the G-20, and all high income countries, Table 2 includes, BRICS and All Emerging Market Economies in the G-20. Both tables give us a clear idea about the population of the emerging markets, which are larger than the advanced countries. This criterion obviously diverges when we focus on China and India. On the other hand, the GNI in PPP is dominant for emerging market economies with 71%. However, the same cannot be said for the GNI per capita, but it is growing much faster in the emerging market economies against advanced countries (Klein and Salvatore 2013). These observations point out an economic shift from the center of gravity from the G-7 countries to the G-20 countries.

On the other hand, renewables particularly solar energy is now set around the world as basic source of energy. The improving cost competitiveness of solar energy technologies, the encouraging policy initiatives, new and user friendly financial opportunities, energy security and environmental factors, which are the key instruments of rapid growth in the power sector create new energy markets in all regions

Table 2 Economic profile of the G-20 in 2010 (Large emerging market economies)

Large emerging market economies	Population in millions	Gross National Income (GNI) in billions of US dollars	Gross National Income (GNI) at Purchasing Power Parity (PPP) in billion US dollars	Per capita GNI at PPP in dollars	Average yearly growth of real GDP 2000–2010 in percentage
China	1338	5721	10,222	7640	10.8
India	1225	1554	4160	3400	8.0
Russia	142	1404	2727	19,240	5.4
Brazil	195	1830	2145	11,000	3.7
South Africa	50	305	520	10,360	3.9
BRICS (all above)	2950	10,814	19,774	6706	8.8
Korea	49	972	1423	29,100	4.1
Indonesia	240	599	1008	4200	5.3
Mexico	113	1008	1627	14,340	2.1
Argentina	40	348	629	15,570	5.6
Turkey	73	720	1230	15,530	4.7
Saudi Arabia	27	434	610	22,750	3.6
Emerging in G-20	3492	14,895	26,301	7505	8.1
All emerging	5767	18,949	33,538	5996	6.4

Source: The World Bank (2012); Klein and Salvatore (2013)

(REN21 2016). These facts motivated us to show the indicated economic shift from the G-7 to the G-20 by considering the improvements on a technological solar energy device: a FPSC. To this end, we wanted to determine these improvements with more practical data. We tried to obtain this data from the applied renewable energy policies in the G-20 countries by an index that we called the policy development index, which will be explained in detail in the following sections. But before that let us take a look at the economic performances of the advanced and the largest emerging market economies in the G-20.

3 Chosen Countries: Economic Performances of the Advanced and the Largest Emerging Market Economies in the G-20

Economic performances of the advanced and the largest emerging market economies can be measured by their average growth rates. Table 3 shows these performances. The Organization for Economic Cooperation and Development (OECD) gave the

Table 3 Average growth rate for the G-7 countries and the largest emerging market economies

Countries	Average growth in GDP, 1995–2011	Average growth in GDP, 2011–2030	Average growth in GDP, 2030–2060
USA	2.5	2.3	2.0
Japan	0.9	1.2	1.4
Germany	1.4	1.3	1.0
France	1.7	2.0	1.4
UK	2.3	1.9	2.2
Italy	1.0	1.3	1.5
Canada	2.6	2.1	2.3
Korea	4.6	2.7	1.0
China	10.0	6.6	2.3
Indonesia	4.4	5.3	3.4
India	7.5	6.7	4.0

Source: OECD (2012); Klein and Salvatore (2013)

current and predicted future values of indicated countries. This information and forecasts tell us that the growth rate of China, India, and Indonesia, which are the largest emerging market economies in the G-20, will be higher than the advanced countries (Klein and Salvatore 2013).

3.1 Current Renewable Energy Support Policies in the G-20 Countries

The announcements and agreements in the G-7 and G-20 countries, which are related to renewable energy, were made firstly in the year of 2015. Those were about increasing the energy efficiency and accelerating it to access renewable energy (REN21 2016). The renewable energy support policies for the G-20 countries are given in Table 4. In Table 4, the renewable energy policies are divided by two main categories: (1) regulatory policies and (2) fiscal incentives and the public financing category. The subtitles are also shown under these main categories.

3.2 Recent Solar Energy Systems' Market and Policy Trends

Policy developments on a FPSC that address a range of market issues such as some government regulations and financing applications for supporting and training businesses can increase the accessing of renewable energy, particularly in the developing countries. For instance, in Taiwan, it is widely understood that economic instruments such as subsidies are important for enhancing the use of renewable energy resources worldwide (Chang et al. 2009). The adaptation for the support

Table 4 Renewable energy support policies for the G-20

Country	Regulatory policies										Fiscal incentives and public financing				
	Renewable energy targets	Feed-in tariff/ premium payment	Electric utility quota obligation / RPS	Net metering/ net billing	Transport obligation/ mandate	Heat obligation / mandate	Tradable REC	Tendering	Capital subsidy, grant, or rebate	Investment or production tax credits	Reductions in sales, energy, CO ₂ , V.A.T, or other taxes	Energy production payment	Public investment, loans, or grants		
Argentina	R	O		O	O			O	O	O	O	O			
Australia	R	●		●	●	●	★*						R		
Brazil	R			R	R	●		★	O	R			O		
Canada	R*	R*	R*	●	O			O	O	O			O		
China	R	R	O		O	O		★	O	O	O		O		
France	R	R			O	O		★	O	O			R		
Germany	O	R			R	O		★	O	O			O		
India	R	O	O	R*	R	●	O	★	O	R	O		O		
Indonesia	R	O	O		R			O	O	O			O		
Italy	O	R		R	R	O	O	O	O	O			O		
Japan	R	R				O	O	O	O	R			O		
Korea_ Republic	O		O	O	R	O	O		O	O			O		
Mexico	R			O				★					O		
Russian Federation	O	O						R	O						
Saudi Arabia	R		●	★*		●	★*				●	●			
South Africa	O		O		R	O		★		O			O		
Turkey	R	O			O			★					O		
UK	O	O	O	O	O		O			O	O	O	O		
USA	R*	●	R*	R*	R	●	●		R	O			R		

Note: O, existing national (could include subnational); ●, existing sub-national (but not national); R, revised (one of more policies of this type); R*, revised sub-national; ★*, new sub-national; ★, new (one or more policies of this type)
Source: REN21 (2016)

policies for renewable heating technologies continued in 2015. The policies were mainly focused on renewable heating devices and the focus point was smaller scale solar thermal heating in commercial and residential buildings, for instance, FPSCs. On the other hand, the renewable energy sector increased its employment rates to a predicted 8.1 million jobs, which were created directly and indirectly in 2015. The leading employment rates in this year were seen in China, Brazil, the USA, and India, consequently (REN21 2016). In addition to this in some developing countries, for instance in Chile, FPSCs have not yet been developed although there exist perfect solar conditions in the country's territory (Araya et al. 2017), and researchers try to take the attention of governments on this crucial subject.

3.2.1 Introducing the FPSC: A General View

FPSCs are reliable, simple, and cost-effective instruments of using the solar energy to provide heating for households and businesses. FPSCs save energy and decrease greenhouse emissions compared to conventional fossil fuel water heating systems in the daily use prospect (Hang et al. 2012; Ma et al. 2018). They are composed of thermal collectors and a thermal fluid system to transfer the heat from collector to its use of purpose. A FPSC can be either forced convection (pumped) or a passive system (natural convection) (Al-Badi and Albadi 2012). Since a typical FPSC has an environmentally friendly nature, buying and installing an FPSC is a rational decision for both producers and consumers. In related to above mentioned, the design of homes with optimization can be possible and the energy efficiency problem for buildings can be solved with this approach (i.e., the energy consumption, environmental factors, and financial costs) (Banos et al. 2011).

The markets have the responsibility to supply the necessary number of FPSCs shown in Fig. 1. But this can not be possible if the public intervention is either unsuccessful or not enough. The reason of this situation can be due to the low and unfair level of competition with fossil fuels or nuclear energy sources, the extra air pollution and energy security costs (European Commission 2013).

3.2.2 Features of the FPSC: A Technical View

Technically, a FPSC converts the solar energy to heat and consists of a storage tank, a flat-plate absorber, and connection pipes between the storage tank, and the collector (Acaroğlu and Baykul 2016). In the FPSCs, there exists no optical concentration. It is used when the required temperature is of the range 40–100 °C. To assemble a FPSC is easy, it does not have any moving part, and has a low operating cost. FPSCs are used for the purposes of heating (i.e. building and water), drying, and industrial processing (Raj and Subudhi 2018). One can find detailed information on the characterization and an economic performance of FPSCs in (Cruz-Peragon et al. 2012), (Ferrer 2017, Zhang et al. 2017), respectively.

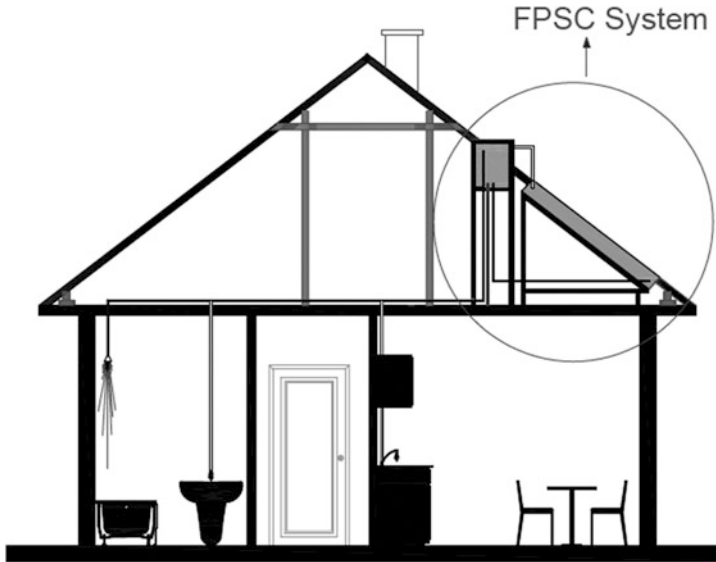


Fig. 1 A FPSC and its utilization. This figure has been designed by the author (M. Celalettin Baykul)

3.2.3 A Specific Global Comparison by FPSCs on the G-20 Countries Among Top World Countries

The solar FPSC technology is widely used all around the world. The total capacity of unglazed and glazed FPSCs continued to increase in 2015, as it is shown in Table 5. Around 94% of the total year's additions are represented by the largest eighteen economies in the same year. The new installations were China, Turkey, Brazil, India, and the USA, in 2015. The top 5 countries for the cumulative capacity at the year-end were China, the USA, Germany, Turkey, and Brazil, respectively (REN21 2016). This information shed light on our hypothesis that was argued in the theoretical frame. In other words, the economic shift from the G-7 to the G-20 is answered through a technological device.

4 Application: Creating a Policy Development Index on Applied Renewable Energy Policy

The market structure and the government policies on renewable energy are taken as a reference for comparison, and are chosen for observing the differences in markets and policy trends of solar FPSC systems in the period between 2005 and 2015. When we indexed the countries according to giving points to their applied renewable energy policy taking reference China (or giving the highest point for the reason of

Table 5 FPSCs total capacity end-2014 and newly installed capacity 2015, top 18 countries

Country	Total end-2014 (GW _{th})			Gross additions 2015 (MW _{th})		
	Glazed	Unglazed	Total	Glazed	Unglazed	Total
China	289.5	0	289.5	30,450	0	30,450
Turkey	12.7	0	12.7	1467	0	1467
Brazil	5.2	2.5	7.7	555	427	982
India	5.2	0	5.2	826	0	826
USA	2.1	14.9	17	119	585	704
Germany	12.4	0.4	12.8	564	0	564
Australia	2.4	3.5	5.9	143	280	423
Israel	3.1	~0	3.2	300	1	301
Mexico	1.3	0.7	2	169	73	242
Denmark	0.7	~0	0.7	194	0	194
Poland	1.2	0	1.2	194	0	194
Greece	3.0	0	3	189	0	189
Spain	2.3	0.1	2.4	166	2	168
Italy	2.8	~0	2.8	161	0	161
Austria	3.3	0.4	3.6	95	0	95
France	1.7	0.1	1.8	71	0	71
Switzerland	0.9	0.1	1	61	4	64
Japan	2.6	0	2.6	59	0	59
Total 18 Top countries	352.3	22.8	375.1	35,782	1371	37,153
World total	383	26	409	38,100	1500	39,600

Source: REN21 (2016)

the dominant character in FPSC systems in the world markets); the indexing is made according to the current applied government policies. For instance; O—existing national (could include subnational), ●—existing sub-national (but not national), R—Revised (one of more policies of this type), R*—Revised sub-national, ★*—new sub-national, and ★—new (one or more policies of this type). Each policy type is pointed based on China.

We found and it is seen from Tables 6, 7 and 8 that the developing countries such as China, India, Argentina, Korea Republic, Indonesia, and Mexico ranked as top 10 among 19 G-20 countries. In other words, a significant convergence is obtained for developing countries about catching up to developed ones on a chosen reference, which is named as a policy development index.

Table 6 An indexing criteria

The given symbol for applied policies	The attained point for the created index
O =	6p
R =	5p
★ =	4p
R* =	3p
★* =	2p
● =	1p

Source: Prepared by the authors

Table 7 The output of an indexing criteria

Country		
Argentina =	R+ 9O =	59P
Australia =	2R + 3● + 1★* + 1O =	21P
Brazil =	4R + 1● + 1★ + 2O =	37P
Canada =	3 R* + 1● + 6O =	46P
China =	2R + 8O + 1★ =	62P
France =	3 R + 6O + 1★ =	55P
Germany =	6O + 2R + 1★ =	50P
India =	3R + 7O + 1R* + 1● =	61P
Indonesia =	2R + 7 O =	52P
Italy =	7 O + 3R =	57P
Japan =	3R + 4 O =	39P
Korea Republic =	9O + 1R =	59P
Mexico =	1R + 7 O + 1★ =	51P
Russian Federation =	3O + 1R =	23P
Saudi Arabia =	1R + 4● + 2★* =	13P
South Africa =	6O + 1R +1★ =	45P
Turkey =	1R + 4 O + 1★ =	33P
UK =	9O =	54P
USA =	3 R* + 3● + 2R + 3O =	40P

Source: Prepared by the authors

5 Conclusions and Policy Recommendations

The most significant finding of our study is that there exists an economic shift from the center of gravity from the direction of the G-7 to the G-20 countries. During this study, we showed this economical shift with the help of a technological device: a FPSC.

The findings have shown that developing countries have consciousness about the needs to transitioning to renewable energy systems. However, there are critical precautions and strategies that G-20 countries should consider for sustainable

Table 8 The ranking of countries against the output of indexing criteria

Ranking	
1- China	11- Canada
2-India	12- South Africa
3- Argentina	13- Japan
4- Korea Republic	14- USA
5- Italy	15- Brazil
6- France	16- Turkey
7- UK	17- Russia Federation
8- Indonesia	18- Australia
9- Mexico	19- Saudi Arabia
10- Germany	

Source: Prepared by the authors

improvements on these technological, environmentally friendly, and energy saving systems. These can be stated as below:

1. Financial problems: Insufficient access to institutional finance
2. Initial cost problems: The high price of renewable energy technologies
3. Labor force problem (Unskilled labor): Qualification problem of the labor force
4. Infrastructure problem: Not enough physical infrastructure and logistics
5. Market structure problems (not competitive): Dominance of incumbents or bureaucracy, and prices are not signals for consumers
6. Governmental problems: Inadequate government policy support and lack of subsidies.

If those handicaps are solved and necessary precautions are taken, transitioning to renewable energy systems will be much easier. In summary, our study aims to figure out and display these critical and crucial marketing and policy decisions as a guideline for demand, supply, and government sectors sides of developing countries. In application, we measured the effectiveness of those economic policies for each country by creating a policy development index level that attains the index values numerically referring to the induced renewable energy policy. As a result, we showed that developing countries could catch up to the developed ones or there could be a convergence on the development level in the long run among the G-20 countries, in the case of implementing, encouraging renewable energy policies, which were emphasized in this study.

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Cluster Analysis of Sustainable Development Goal Indicators in the European Union



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Abstract Sustainable development (SD) is a fundamental objective of the European Union (EU) enshrined in its primary law. The EU Sustainable Development Strategy (SDS) was adopted in 2001 and subsequently, its external dimension in 2002. The EU Sustainable Development Goal (SDG) indicator set replaced the EU SDS in 2017. Selected indicators of this set were used in a cluster analysis to classify the sample of the 28 EU countries and Norway according to their performance in sustainability. In the selection of indicators, priority was given to the indicators reflecting decoupling and the indicators related to the climate and energy targets, along with the important representatives of the economic, social and institutional dimensions of SD generally. The Hierarchical Cluster Analysis (HCA) was applied to create four clusters using the indicator values in the initial year (primarily 2007) and the most recent year (predominantly 2016). The changes in the allocation to clusters also reflect the path of SD in the countries investigated.

Keywords Decoupling · European Union (EU) · Hierarchical Cluster Analysis (HCA) · Sustainable development (SD) · Sustainable Development Goals (SDGs)

1 Introduction

Since the 1980s, sustainability has emerged as a principle in opposition to unlimited growth (Gowdy 1994). Allen (1980) defined sustainable development (SD) as development that is likely to achieve lasting satisfaction of human needs and improvement of the quality of human life. The most quoted definition is that of the World Commission on Environment and Development (WCED 1987), according to which SD is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. At the essence of SD is a

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life of dignity for all within the planet's limits that reconciles economic prosperity and efficiency, peaceful societies, social inclusion and environmental responsibility. The United Nations (UN) adopted the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs) in September 2015. They have provided a new stimulus to global efforts for achieving SD. The SDGs represent a recent policy framework worldwide for issues that are crucial for the path of SD. The EU, in coordination with its member states, is committed to supporting the implementation of the 2030 Agenda. The EU's response to this Agenda is described in the 2016 European Commission's Communication (European Commission 2016).

In compliance with these definitions and features of SD and sustainability, this chapter deals with the SD and sustainability of the European Union (EU) countries along with Norway. The aim of the chapter is to form clusters from a group that includes the EU countries plus Norway using their sustainability performance measured by selected indicators included in the EU SDG indicator set. The indicators for all three pillars of SD are used, but in the center of interest are the crucial indicators reflecting decoupling and the indicators related to the climate and energy targets. The performance in sustainability is compared in the sample of 29 countries, i.e., the 28 EU countries and Norway, according to their allocation to individual clusters. The changes in assignments to clusters as well as in the indicator values also give information about the path of SD. The structure of the chapter is as follows: Section 2 contains theoretical foundations for the analysis and the literature review. Section 3 describes data and methodology used. Results of the analysis are presented in Sect. 4 and conclusions are included in Sect. 5.

2 Theoretical Foundations and Literature Review

The concept of SD can be interpreted as a balance between its pillars, i.e. the economic, social and environmental pillar. The concept is broad and still vague, but there is an emerging political consensus on the desirability of SD (Daly 1996). Accordingly, for the assessment of progress toward SD, it is important to use statistical tools (Adamišín et al. 2015). Because the crucial decoupling indicator included in the EU SDG indicator set, i.e., Resource Productivity, is also used and special attention is paid to it, the concept of decoupling needs to be defined. Decoupling is the process that is inevitable to move economies closer to SD and achieve the SD path. Therefore, decoupling is also applied in the monitoring of SD in the EU using decoupling indicators (Drastichová 2014, 2017). The concept of decoupling refers to breaking the link between two variables, often referred to as the driving force, mainly economic growth expressed in terms of GDP, and the environmental pressures, such as the use of natural resources, the generation of waste, and the emission of pollutants to the environment (OECD 2002). The purpose of decoupling indicators is to monitor the interdependence between these two different spheres and they usually measure the decoupling of the environmental pressure from the economic growth over a given period (OECD 2003).

Table 1 Themes and headline indicators of the sustainable development indicators

Theme	Headline indicator	Theme	Headline indicator
Socioeconomic development	Real GDP per capita, growth rate and totals	Climate change and energy	Greenhouse gas emissions Primary energy consumption
Sustainable consumption and production	Resource Productivity	Sustainable transport	Energy consumption of transport relative to GDP
Social inclusion	Persons at-risk-of-poverty or social exclusion	Natural resources	Common bird index
Demographic changes	Employment rate of older workers	Global partnership	Official development assistance as share of gross national income
Public health	Healthy life years and life expectancy at birth, by sex	Good governance	No headline indicator

Source: Eurostat (2018a)

A number of studies have dealt with the evaluation of SD in the EU, such as Radojičić et al. (2012), and Iščlamović et al. (2015). As regards the work of Radojičić et al. (2012), the I-distance ranking method which synthesizes many indicators into one quantitative indicator is proposed. It is a metric distance in an n-dimensional space. The 27 EU member states were analyzed. As input variables, the EU Sustainable Development Indicators (SDIs) of the EU Sustainable Development Strategy (SDS), particularly 11 indicators, are used (see Table 1). The modifications in comparison to Table 1 are as follows. Instead of Primary energy consumption, the Share of renewable energy in gross final energy consumption is used. For the public health and demographic change themes, the indicators are used separately for men and women, while for the former the healthy life years indicator is used. For the socioeconomic development theme, the growth rate of real GDP is used. For Natural resources and Good governance themes, no indicators were used. According to the results, Sweden and Denmark are the two top EU countries concerning SD. Luxembourg, the Netherlands, the UK, and Cyprus follow them in performance. On the other hand, the new EU members, such as Latvia, Hungary, Estonia, Lithuania, and Slovakia remain at the bottom of the ranking.

Concerning the work of Iščlamović et al. (2015), the authors proposed the I-distance method for evaluating countries' welfare and the 25 EU countries were analyzed. They used 13 variables according to the dimensions of SD: economic indicators (GDP per capita (current US\$); Unemployment rate; Energy use (kg of oil equivalent per capita); Consumer price index (2005 = 100)), social indicators (Health expenditure per capita (current US\$); Nurses and midwives (per 1,000 people); Physicians (per 1,000 people); Hospital beds (per 1,000 people); Health expenditure (% of GDP); ICT development level; Democracy index) and environmental indicators (Ecological Footprint (Rees 1992; Wackernagel and Rees 1996); Environmental Performance Index). Luxembourg is the best-performing country and it is followed by Austria, Sweden, the Netherlands, Germany, Finland, Denmark,

and Belgium in 2012, while in 2007 Luxembourg was the best-performing country followed by the Netherlands and Denmark. Romania is the worst-performing country in both years and the countries that preceded this country are Hungary (23rd in the ranking) and Bulgaria (24th in the ranking). Janković et al. (2016) ranked the EU-28 countries according to the achieved objectives of the SD strategies in 2013. The smaller set of the Commission on Sustainable Development (CSD) indicators (20) is observed and the statistical I-distance method was used. CSD indicators in the following themes are used: Poverty (3), Health (4), Education (3), Demographics (1), Atmosphere (2), Land (1) and Economic Development (6). Luxembourg is the best-performing country and it is followed by Sweden, Finland, the Netherlands, and Denmark. The worst-performing countries are Latvia, followed by Lithuania, Bulgaria, and Romania.

An additional sustainability assessment, based on an approach using a combination of Footprint Indicators, allowing also for the available biocapacity, with Human Development Indicators, was applied in Drastichová (2018a). The EU-28 countries, along with Norway, Switzerland, the USA, and Canada were investigated. Norway was evaluated as the best performing, i.e., the most sustainable, country, followed by Finland. A poor performance is especially shown by the USA, but also by the Benelux countries and Canada.

Three studies, which are most similar to the analysis carried out in this chapter, are described in more detail. Adamišín et al. (2015) analyzed the status and development of SD in Central and South-Eastern Europe countries via selected global indicators of sustainability. They analyzed whether changes in economic, social, environmental, and institutional areas led to changes in the similarity of particular countries during an approximately 12-year period. The authors carried out the analysis of similarity or changes in the development of long-term sustainability in the following countries: Bulgaria, the Czech Republic (CR), Greece, Hungary, Poland, Austria, Romania, Slovakia, and Slovenia. Indicators were selected to cover all three pillars of SD, i.e., the economic, environmental, and social one. The following indicators were used: GDP per capita, Resource Productivity in Euro per kg, life expectancy at birth in years, energy use in kg of oil equivalent per capita, and fossil fuel energy consumption in percentage of total (the headline indicators included in the EU SDS displayed in Table 1 prevail). The selection of indicators was made in order to evaluate long-term sustainability. As clustering method, group average (unweighted pair group) was used (the other conditions: distance type—Euclidean, scale type—standard deviation). In 2000, authors identified two, respectively, three clusters of countries. The first cluster is composed of Slovakia and Slovenia. These two countries are most similar among all the countries investigated. The CR can be included as well, although the degree of similarity with those two countries is significantly lower. The second cluster includes Romania and Hungary as the other two most similar countries, and moreover, Bulgaria and Poland. The third cluster contains Austria and Greece, although the degree of similarity between the two countries is very low. Their combined cluster is formed at a very high distance, i.e., these countries can be referred to as the uncoupled cluster countries. In 2012, few changes occurred in comparison to 2000. Grouping of the countries via

the indicators is more homogenous than before. The large cluster contains Romania and Bulgaria as the most similar countries, Hungary, Slovakia, and Poland (the latter is a little less similar country). The second cluster consists of Slovenia and the CR. The remaining two countries, Austria and Greece, do not create a separate cluster as it was in 2000. In 2012, Austria is closer to the group including Slovenia and the CR than to Greece in 2000. Assessments of changes over time were carried out only by comparing the individual results of each period.

Huttmanová (2016) aimed for an evaluation of the management of SD in the 28 EU countries via selected indicators characterizing SD and its main dimensions. For the evaluation based on cluster analysis, nine headline indicators of the EU SDIs representing their themes were chosen (see Table 1), while in comparison to Table 1 some modifications were used. The indicators for the Public health theme were used separately for men and women. For the Climate change and energy theme only, the Primary energy consumption indicator was used. For the Sustainable transport theme, two indicators were used: Energy consumption of transport relative to GDP and Greenhouse gas emissions by transport mode. For the Global partnership theme the indicator of CO₂ emissions per inhabitant in the EU and in developing countries was used. The Demographic Changes, Natural Resources and Good Governance themes were not reflected. A HCA method was applied and for the measurement of distance among individual points, Euclidean distance and the method of the nearest neighbor were used. Two relatively separate clusters were created. Cluster 1 is composed of Germany, France, Italy, the UK, and Spain. Cluster 2 is composed of the remaining countries, which also create other separated clusters: (2a) Belgium, Austria, Sweden, Denmark, Ireland, Finland, and the Netherlands; (2b) Bulgaria, Estonia, Croatia, Lithuania, Slovakia, Latvia, Cyprus, Malta, Slovenia, Hungary, the CR, Greece, and Portugal; (2c) Poland; and (2d) Luxembourg. It was not possible to assign Poland and Luxembourg definitely to any of the clusters. As regards the second cluster, the closest linkage, i.e., the highest measure of similarity, is shown by: (1) Croatia, Lithuania, and Slovakia; (2) Denmark and Ireland; and (3) Greece and Portugal.

Allievi et al. (2011) applied an HCA to cluster the EU-27 countries using their performance measured by the EU SDIs. The grouping of the countries is carried out by applying the HCA to selected indicators. The cluster analysis was carried out on the normalized distance matrices of the indicators due to the various natures of the included indicators. The city block distance was applied to calculate the distances of each indicator. The countries were scored according to their sustainability performance measured by the selected indicators. The weight reflects the relative importance of the indicator with respect to the other indicators in the same dimension, and it also determines the maximum scoring points available from that indicator. For each indicator, the best-performing country is assigned the number of points equal to the weight of the indicator, while the worst-performing country is given a score of zero. The remaining countries obtained a linearly scaled score according to their relative performance in relation to the best-performing country. Allievi et al. (2011) produced the results of the hierarchical agglomerative clustering carried out on the EU-27 countries for the three dimensions of sustainability in 1997 and 2005. In the

social dimension, Cyprus was the best-performing country in 1997 and Sweden in 2005 (Cyprus was the fourth best-performing country), while the worst performance was shown by Hungary in 1997 and Portugal in 2005. In the environmental dimension, Latvia had the highest performance in both years, Luxembourg the lowest performance in 1997 (that of Cyprus was the second lowest) and Cyprus in 2005 (that of Luxembourg was the second lowest). In the economic dimension, the UK followed by Denmark were the best-performing countries in 1997 and Denmark followed by Sweden in 2005. Bulgaria was the worst-performing country in 1997 and Malta in 2005. In both years, they are followed by Italy and Greece (in a different order). It can be seen that although Cyprus had a high performance for the social pillar of SD, its performance in the environmental pillar was very low. Based on the strong sustainability principle, one dimension cannot be offset by the others to achieve the path of SD. Conversely, Sweden had a high performance in all three dimensions.

The literature review and the indicators and results of the studies introduced can be used for comparisons with the sustainability assessment carried out in this chapter. In the analysis of this chapter the focus is on the simultaneous assessment of all three dimensions of SD, along with the fourth, the institutional dimension. The innovation of this chapter is the application of the new EU SDG indicator set for comparisons of the performance in sustainability and the path toward SD of the EU-28 countries along with Norway. Moreover, the selection of indicators was considered carefully to reflect all four pillars of SD and to involve the indicators that are, besides reflecting the previous EU SDIs set, also included in the other EU strategies and indicator sets focused on SD, especially the Europe 2020 strategy and the Resource Efficiency Scoreboard. It was also aimed to assess all four dimensions simultaneously in order to refer to overall sustainability and the path of SD. The changes in the composition of the clusters and between the years are also analyzed to discover if the path of SD was pursued. Moreover, two crucial indicators related to the environmental pillar in general and climate–energy aspects and decoupling in particular are analyzed more in detail to derive additional results related to SD.

3 Data and Methods Applied

3.1 Cluster Analysis

Cluster analysis is a convenient method for identifying homogenous groups of objects called clusters. These objects (or cases, observations) in a specific cluster share many characteristics, but are very dissimilar to objects not belonging to selected cluster (Mooi and Sarstedt 2011). HCA of n objects is defined by a stepwise algorithm that merges two objects at each step, the two which have the least dissimilarity or distance. The classification contains a series of partitions of the data where the first consists of n single-members clusters, while the last is made by a single group containing all n individuals. At each step, individuals or groups of

Table 2 Indicators chosen for the cluster analysis and the data modifications

SDG/indicators used	Initial year	Recent year
SDG1: People at risk of poverty or social exclusion; percentage	HR— 2010	—
SDG7: Population unable to keep home adequately warm (% of population)	HR— 2010	—
SDG9: Gross domestic expenditure on R&D, all sectors (% of GDP)	—	FR—2015
SDG10: Gini coefficient of equalized disposable income (coefficient of 0 (maximal equality) to 100 (maximal inequality))	HR— 2010	
SDG11: Recycling rate of municipal waste (% of total waste generated)	—	IR, PT—2014; SL—2015;
SDG12: Resource Productivity, PPS per kilogram		NO—2015
SDG13R: Share of renewable energy in gross final energy consumption (%)	—	—
SDG16: Corruption perceptions index (score scale of 0 (highly corrupt) to 100 (very clean))	—	—
SDG17: Shares of environmental taxes in total tax revenues (% of total taxes)	—	—

SDG2: Area under organic farming (% of utilized agricultural area); SDG3: Life expectancy at birth total (years); SDG4: Early leavers from education and training total (% of population aged 18–24); SDG5: Gender employment gap (percentage points (p.p.)); SDG8G: Real GDP per capita, chain linked volumes (percent. change on previous period); SDG8U: Long-term unemployment rate; SDG13G: Greenhouse gas emissions—tones per capita; SDG13GI: Greenhouse gas emissions intensity of energy consumption.

Source: Eurostat (2018a); author's elaboration

individuals which are closest are fused together (Everitt 1993). An HCA was used to form clusters of countries investigated based on the indicator values of 2 years: the most recent year, predominantly 2016, and the initial year 2007. The data are not available in some countries and for several indicators in these years and therefore, some modifications were used (described in Table 2). Ward's method is applied as a cluster method and the squared Euclidean distance was chosen from measures for interval to specify distance. The reason is that quantitative variables are applied. The Z scores were chosen from the available standardization methods since the variables included are measured in different units (Aldenderfer and Blashfield 1984; Meloun and Militký 2002; Řezanková et al. 2007).

3.2 Sets of Indicators Applied in the Cluster Analysis

The former indicator set for the measurement of the progress toward the EU SDS was the EU SDIs composed of more than 130 SDIs. Ten indicators represented headline indicators. They give an overall view of the EU's progress toward SD with regard to the objectives and targets of the EU SDS. The main themes and headline indicators are displayed in Table 1.

The EU SDS and its SDI set were replaced with the EU SDG indicator set, which reflects the themes of the SDGs. Therefore, the indicators from the EU SDG indicator set were chosen for the investigation. This set contains 100 indicators that are structured along the 17 SDGs (see Eurostat 2018a). Each goal has six indicators primarily attributed to it, except for goals 14 and 17 which only have five indicators. Multipurpose indicators are included as well. Thus, although some of the indicators chosen for the analysis also represent additional SDG themes, they were selected according to the criteria to reflect all the relevant aspects of SD and the indicators included in the EU's priorities and its relevant strategies were favored. All indicators are grouped in sub-themes to show interlinkages and to emphasize different aspects of each SDG. When compared to the previously used set for the measurement of SD, the EU adjusted its framework to the global agenda and the indicators are currently classified according to the framework of 17 SDGs. However, a number of indicators remained the same or similar to those used under the framework of the EU SDIs. It means that the priority areas for SD in the EU remained similar (see more in Drastichová (2018b)). It was endeavored to choose the crucial representative indicator of each SDG, apart from SDG14 and SDG15. SDG14 is irrelevant for some countries and for SDG15 there was a lack of data in many countries.

This process of selection is specified at the beginning of Sect. 4. Nine indicators were chosen for which the data were available and which also satisfied the conditions required for a cluster analysis. The indicators left out from the analysis due to noncompliance with these conditions are also summarized in the last row of Table 2.

The process of indicator selection was determined by their relevance as representative indicators of the SD pillars. The indicators used as headline indicators of the EU SDIs (SDG1, 3, 8G, 12, and 13G) (Eurostat 2018a) and the Europe 2020 strategy (SDG1, 4, 9, 13G, and 13R) (European Commission 2010), along with the Resource Efficiency Scoreboard indicators (SDG2, 12, 13G, 13R, 11, and 17) (Eurostat 2018b), were favored.

The priority was to reflect all three basic dimensions of SD, along with the aspects of decoupling (see more in Drastichová (2016, 2017)) represented by the SDG12 indicator that is also the headline indicator in theme 2 of the EU SDIs (see Table 1) and the lead indicator in the Resource Efficiency Scoreboard, along with the institutional pillar, for which the relevant SDG16 indicator was chosen. Moreover, the SDG17 indicator is also used as the representative of the institutional aspects. Within the EU SDI set, the SDG17 indicator is the operational indicator of the Good Governance theme and its subtheme named Economic instruments. The SDG13R indicator, i.e., the Share of renewable energy in gross final energy consumption, plays a crucial role in all four indicator sets (in the EU SDIs, it is the operational indicator in the Energy subtheme). However, two other indicators related to climate change issues were omitted due to their insignificance (SDG13G and 13GI). Climate change is a crucial topic for SD. More particularly, it is the unsustainable trend and one of the main threats to SD (according to the EU SDS, see Commission of the European Communities (2001)) and it requires additional specific analyses (see more in Drastichová (2017)). Accordingly, the climate and energy topic is represented by

the SDG13R indicator that is included in all the above indicated indicator sets. Moreover, the social aspects related to energy are represented by the SDG7 indicator. The SDG8U indicator was considered to reflect the Socio-Economic Development theme and its subtheme named Employment in the EU SDI set (see more on Eurostat 2018a), while Employment is also one of the themes in the Europe 2020 strategy for which the targets and headline indicators were determined (European Commission 2010). The SDG10 indicator was chosen to underline the importance of the social pillar as some of the other crucial social indicators had to be omitted due to the noncompliance, i.e., the SDG3, 4, and 5 indicators. The SDG4 indicator was also included as the operational indicator in theme 3, named Social inclusion, in the EU SDIs (the subtheme—Education). On the other hand, the inclusion of the SDG10 indicator is the innovation of the EU SDG indicator set when compared with the EU SDIs set. Using the indicated criteria, the nine indicators included in Table 2 (apart from the last row) were chosen.

To sum up, the SDG1 and the SDG10 indicators represent the social pillar of SD, along with the SDG7 indicator, although the latter is predominantly related to energy sustainability (see Table 2). The SDG9 indicator represents the economic pillar and the SDG11, 12, 13R, and 17 indicators reflect the environmental pillar. Resource Productivity (SDG12) is also an important decoupling indicator reflecting the efficiency of resource use, and the Share of environmental taxes in total tax revenues indicator (SDG17) also reflects the institutional aspects, or partnership for the goals. The SDG16 indicator is the direct representative of the institutional pillar of SD.

4 Results of the Analysis

The results of the HCA are included and analyzed in Sect. 4.1 and the detailed analysis of the indicators is included in Sect. 4.2. The overall assessment is included in Sect. 4.3. Eurostat (2018a) was used as the data source.

4.1 Results of the Cluster Analysis

Primarily, all the 17 indicators introduced in Table 2 were chosen for the analysis. According to the results of the One-Way ANOVA, not all the indicators included were significant by forming the clusters at the 0.05 level of significance. Therefore, the SDG2, 3, 4, 5, 8G, 8U, 13G, and 13GI indicators (insignificant at the 0.05 level of significance in the initial or recent year, or both of them) were omitted. All the nine remaining indicators were significant by forming the clusters. The SDG16 indicator had the highest influence in both years because the calculated F-statistic showed the highest level (27.533 and 32.142 in the initial and the recent period, respectively). Further, the correlation and multicollinearity of the indicators included were tested. Meloun and Militký (2002) indicate that if the Variance Inflation Factor

Table 3 The composition of the four created clusters

	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Initial year	BE, DE, ES, FR, LU, NL, AT, UK	BG	CZ, EE, IE, GR, HR, IT, CY, LT, LV, HU, MT, PL, PT, RO, SL, SK	DK, FI, SE, NO
Recent year	BE, DE, FR, LU, NL, AT, UK	BG, EE, GR, ES, HR, IT, CY, LT, LV, PT, RO	CZ, IE, HU, MT, PL, SL, SK	DK, FI, SE, NO

Source: Author's elaboration

AT Austria; *BE* Belgium; *BG* Bulgaria; *CY* Cyprus; *CZ* Czechia, *DE* Germany; *DK* Denmark; *EE* Estonia; *ES* Spain; *FI* Finland; *FR* France; *UK* The United Kingdom; *GR* Greece; *HR* Croatia; *HU* Hungary; *IE* Ireland; *IT* Italy; *LT* Latvia; *LU* Luxembourg; *LV* Lithuania; *MT* Malta; *NL* The Netherlands; *NO* Norway; *PO* Poland; *PT* Portugal; *RO* Romania; *SE* Sweden; *SL* Slovenia; *SK* Slovakia

(VIF) is higher than 10, strong multicollinearity exists in data. The VIF statistics were below 10 in all the regressions investigated. In this group of nine indicators, the highest level of the Pearson Correlation was between SDG1 and SDG10 in the recent year (0.858) and between SDG1 and SDG7 in the initial year (0.829). The Pearson Correlation also exceeded 0.8 between SDG1 and SDG7 in the recent period (0.814) and between SDG9 and DG16 in the initial period (0.807). Thus, all the coefficients were lower than 0.9, and none of them confirmed a strong dependence, which is signified by values of 0.9 or above (Sambandam 2003) (Table 3).

The allocation of countries to clusters in both years is shown in Table 4. Cluster 1 contains the more developed EU countries, i.e., the Benelux countries, Austria, Germany, France, and the UK, plus Spain in the first year. Cluster 2 contains only Bulgaria in the first year, but all four Southern countries are included in the second year. Spain shifted from Cluster 1 and the other three countries from Cluster 3. Moreover, all three Baltic countries shifted to Cluster 2 in the recent year from Cluster 3, where they were included in the first year. This is also the case for Cyprus, Croatia, and Romania. Additional Cluster 3 countries remained in Cluster 3. No country was added to this cluster in the recent period and thus, the number of countries decreased from 16 to 7. Cluster 4 has the same composition in the initial and recent year, it is composed of the 4 Northern countries.

The characteristics of the clusters in terms of their means and standard deviations are summarized in Table 4. The following Boxplots displayed by Figs. 1 and 2 show the distribution of data for nine indicators in the four clusters based on the five-number summary including minimum, first quartile, median, third quartile, and maximum. Accordingly, the results included in Table 4 were extended.

Figures 1 and 2 show the distribution of data for nine indicators in the initial and the recent year, respectively. Accordingly, the changes in the composition of clusters 1–3 are reflected. Subsequently, the order and ranking of the clusters' means and medians are summarized in Table 5, according to which the sustainability and SD of clusters are evaluated. The performance of the clusters is assessed according to the means and medians for nine indicators in particular clusters in both periods.

Table 4 Descriptive statistics for the four clusters in the initial and the recent year

Indic (Clus)	Mean (Rec)	St. D. (Rec)	Mean (In)	St. D. (In)	Indic (Clus)	Mean (Rec)	St. D. (Rec)	Mean (In)	St. D. (In)
17(1)	5.821	1.548	6.163	1.599	17(3)	7.687	1.666	7.584	1.178
16(1)	78.143	4.880	74.625	6.255	16(3)	57.857	8.335	53.688	9.555
13R(1)	13.386	9.750	8.375	8.297	13R(3)	12.743	4.807	12.400	8.045
12(1)	2.960	0.808	2.035	0.597	12(3)	1.835	0.340	1.118	0.466
11(1)	52.086	8.293	46.200	13.147	11(3)	33.757	15.179	12.694	9.680
10(1)	28.814	2.053	28.625	2.608	10(3)	27.114	2.427	30.863	4.631
9(1)	2.243	0.661	1.859	0.421	9(3)	1.206	0.490	0.839	0.336
7(1)	3.800	1.571	5.225	4.454	7(3)	6.086	1.787	15.725	12.261
1(1)	19.329	1.845	19.425	3.050	1(3)	20.329	4.306	26.831	7.762
17(2)	8.625	1.669	10.110	–	17(4)	6.730	1.487	7.270	2.030
16(2)	53.636	8.652	41.000	–	16(4)	88.000	2.160	88.250	2.363
13R(2)	22.855	7.963	9.200	–	13R(4)	48.525	16.599	37.925	18.307
12(2)	1.646	1.053	0.560	–	12(4)	1.371	0.333	1.331	0.431
11(2)	27.891	11.072	20.600	–	11(4)	47.425	6.910	42.325	4.822
10(2)	34.082	2.286	35.300	–	10(4)	26.425	1.424	24.625	1.312
9(2)	0.891	0.334	0.430	–	9(4)	2.728	0.505	2.673	0.830
7(2)	18.818	10.960	67.400	–	7(4)	1.975	0.846	3.500	4.553
1(2)	30.582	5.338	60.700	–	1(4)	16.725	1.228	16.150	1.546

Source: author's elaboration

Indic Indicator; Clus cluster; In initial year; Rec recent year; St. D. Standard deviation

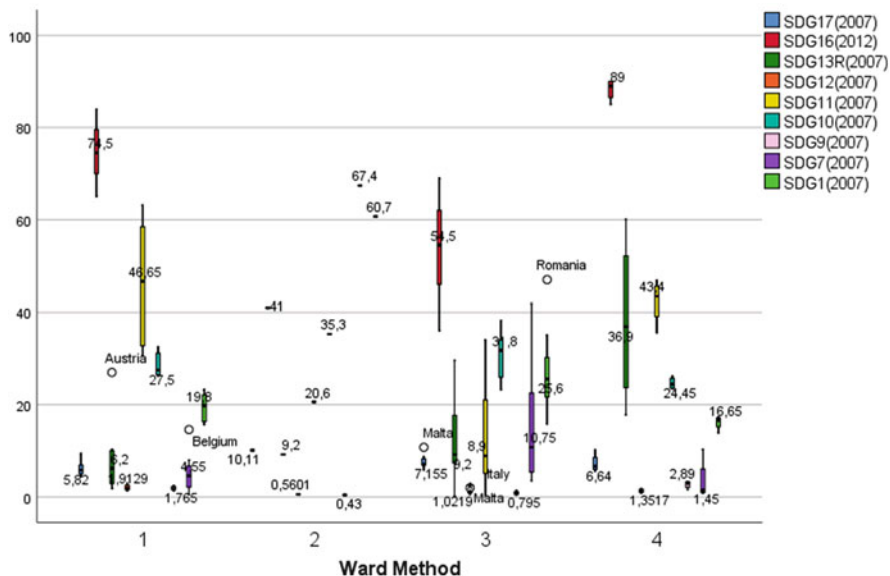


Fig. 1 Boxplots for the indicators in the initial year, classified into the four clusters (Source: Author's elaboration)

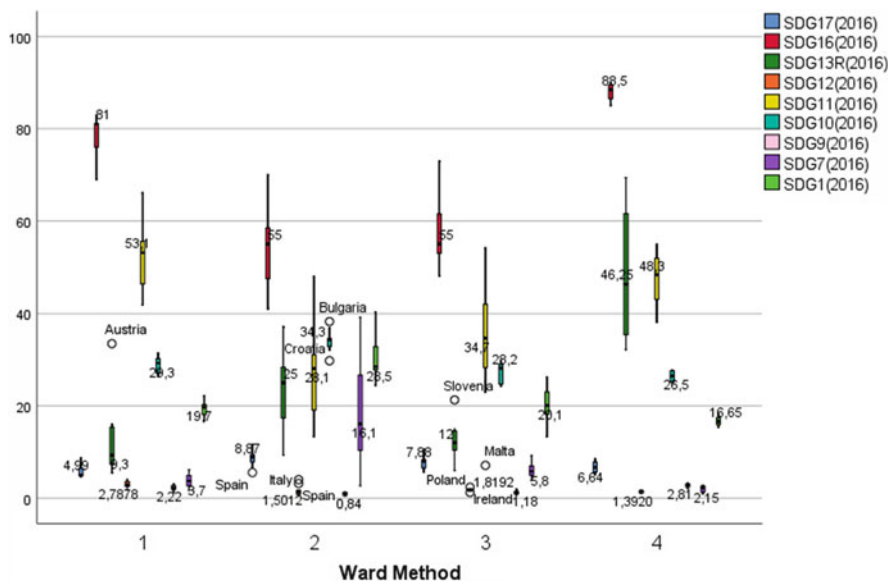


Fig. 2 Boxplots for the indicators in the recent year, classified into the four clusters (Source: Author's elaboration)

Table 5 Overall ranking of the means and medians in the individual clusters, the initial and the recent year

SDG	Clus1	Clus1	Clus2	Clus2	Clus3	Clus3	Clus4	Clus4
	Initial	Recent	Initial	Recent	Initial	Recent	Initial	Recent
17	4	4	1	1	2	2	3	3
16	2	2	4	4/3	3	3/3	1	1
13R	4	3/4	3/2	2	2/3	4/3	1	1
12	1	1	4	3	3	2	2	4
11	1	1	3	4	4	3	2	2
10	3	2	1	1	2	3	4	4
9	2	2	4	4	3	3	1	1
7	3	3	1	1	2	2	4	4
1	3	3	1	1	2	2	4	4

Note 1: 1—the highest level; 2—the second highest level, 3—the third highest level, 4—the lowest level; Clus—cluster

Note 2: If the order of means and medians is different, the first in the order the mean and second in the order the median is indicated

Source: Author's elaboration

As regards the SDG1, 7, and 10 indicators, which are People at risk of poverty or social exclusion, Population unable to keep home adequately warm and Gini coefficient of equalized disposable income, respectively, the highest means and medians and thus the worst results were shown by cluster 2 in both years. For the SDG10 indicator, the order changed for clusters 1 and 3 between the initial and the recent year, i.e., cluster 3 achieved the higher performance in 2016 (see Table 5). The lowest means and medians and the best performance were achieved by cluster 4. It can be concluded that for these three crucial social indicators, while the SDG7 indicator also reflects energy (environmental) aspects, cluster 4 is the best-performing cluster and cluster 2 showed the lowest performance in both years. Although cluster 2 changed its composition significantly, its performance remained the lowest. On the other hand, the means and medians dropped significantly for the SDG1 and 7 indicators and slightly for the SDG10 indicator. For the SDG9 indicator, i.e., gross domestic expenditure on R&D, the highest means and medians, and thus the highest performance, were achieved by cluster 4 and the lowest ones by cluster 2 in both years. The results for this indicator reflecting the economic pillar of SD, together with the possibilities for decoupling and thus for improvements in the environmental dimension as well as in the other two SD dimensions, confirm the highest performance of cluster 4 and the worst results shown by cluster 2. The changes of means and medians between the years (the decreases in the case of SDGs 1, 7, and 10 and the increases in the case of SDG9) predominantly reflect the shifts toward the higher sustainability levels, except for those having taken place for both the median and the mean in cluster 4 for the SDG1 indicator, those in cluster 4 and cluster 1 for the SDG10 indicator and medians in cluster 4 for the SDG7 and SDG9 indicators. Thus, the most sustainable cluster, which was cluster 4, and the second

best performing, which was cluster 1, showed some changes toward lower sustainability levels, while cluster 4 did not even change its composition.

The recycling rate of municipal waste representing SDG11 had the highest means and medians in cluster 1 in both years. The lowest values were shown in cluster 2 in the recent and cluster 3 in the initial year. Cluster 4 is the second best-performing cluster in both years. Clusters 2 and 3 changed their order when cluster 3 increased its performance in relation to cluster 2. The highest means and medians for Resource Productivity representing SDG12 were in cluster 1 in both years. The lowest levels were shown by cluster 2 (represented only by Bulgaria) in the initial and cluster 4 in the recent year. Despite the high performance of cluster 4 in the majority of the included indicators, Resource Productivity in PPS per kilogram showed relatively low values in Finland (0.802 and 0.962 PPS per kg, respectively) and middle-sized values in other three countries. This is especially the case for the recent year because, in 2007, Norway showed relatively high Resource Productivity (higher than the average value in the sample, i.e., 1.819) and the overall performance of cluster 4 was higher. In the recent year, it is highest in Denmark (1.74 PPS per kg, which is below the average value in the sample). The highest mean average and median average for the SDG13R indicator (Share of renewable energy in gross final energy consumption), and thus the best performance, were achieved in cluster 4 in both years. The lowest values were seen in cluster 1 in the first year and in cluster 3 in the second. However, the median in cluster 1 was also the lowest in the recent period, lower than the mean and median of cluster 3 (see Fig. 2). For these three indicators, the results are contradictory to some extent. For the SDG11 and 12 indicators, the highest performance is shown by cluster 1, but this cluster showed relatively low average Share of renewable energy (SDG13R). On the other hand, cluster 4 showed the unambiguously highest performance in this indicator, the second highest performance in the SDG11 and SDG12 indicators in the initial period, but the lowest performance in the latter indicator in the recent period. For all three indicators representing the environmental dimension of SD, the means and medians increased in all clusters, which can be understood as a shift toward higher sustainability as their levels increased between the years.

For the SDG16 indicator, i.e., Corruption Perceptions Index, the highest means and medians (and the best performance) were in cluster 4 and the second highest in cluster 1 in both years. The lowest levels and the poorest performance were shown by cluster 2. However, the medians showed the same levels for clusters 2 and 3 in recent year. Finally, for the SDG17 indicator, i.e., Shares of environmental taxes in total tax revenues, the highest levels were in cluster 2 and the lowest levels in cluster 1 in both years. Some changes occurred in the order of the descriptive statistics in clusters 3 and 4. In the initial period, the mean of cluster 4 is higher than the median in cluster 3, in the recent period the opposite is true. In the last two indicators representing the institutional dimension of SD (the latter also the environmental dimension), the results are not unambiguous because cluster 2 showed one of the poorest results in the SDG16 indicator, but the highest average Shares of environmental taxes in total tax revenues (the SDG17 indicator). On average, cluster 4 can then be evaluated as the best-performing cluster, having the best results for the

SDG16 indicator; although the values of the SDG17 indicator are lower (explained in more detail in Sect. 4.2). For the SDG16 indicator, the only slight decreases in mean and median occurred in the best-performing cluster, cluster 4. As regard the SDG17 indicator, the means and medians declined in clusters 1 and 2 between the years. This is also the case for the mean in cluster 4, but its median did not change.

To sum up, cluster 4 showed the highest performance in most indicators, but changes toward higher unsustainability predominantly occurred in this cluster as well. Overall, it can be regarded as the most sustainable cluster despite some slight negative changes in the indicators of the economic, social, and institutional dimensions. On the other hand, improvement occurred in three crucial environmental indicators (the SDG11, 12, and 13R indicators), which also happened in all the clusters. Cluster 4 did not change its composition between the years and therefore the changes are good assessable. Conversely, cluster 2 changed the composition significantly and this is the cluster with the lowest average performance and sustainability. Cluster 1 can be evaluated as the second best-performing cluster. The values of the indicators in particular countries are further analyzed in Sect. 4.2 in order to explain the results of the cluster analysis in more detail.

4.2 Deeper Analysis of the Relations Between Selected Indicators

In this subsection, the focus is on the summary assessment of all the indicator values in the countries of the sample. Subsequently, the values of two important indicators representing the environmental pillar of SD, along with the climate–energy aspects and those of decoupling are evaluated according to their levels in the four clusters. As regards the values of all the indicators in the countries investigated, the five countries with the highest and lowest values for each indicator are displayed in Table 6.

The indicator of people at risk of poverty or social exclusion (SDG1) was the lowest in Sweden in 2007 (13.9%). However, it was the lowest in CR in 2016 (13.3%). The shares of the Northern countries included in cluster 4 are among the lowest in both years (all below the average levels), although the share in Sweden in 2016 is slightly higher (18.3%). The highest shares in both years are shown by Bulgaria, followed by Romania. The share of Greece is the third highest in 2016 (35.6%). While the shares decreased significantly in Bulgaria and Romania (from 60.7% in Bulgaria and 47% in Romania by 20.3 and 8.2 p.p., respectively), along with Poland (by 12.5 p. p), the share increased most in Greece (7.3 p.p.), followed by Spain (4.6 p.p.), and Sweden (4.4 p.p.). These results are related to the impacts of the economic crisis. In addition to the Northern countries and the CR, the countries with low shares in both years are the Netherlands and Austria. However, in both countries, the shares increased slightly. Population unable to keep home adequately warm (SDG7) showed the lowest levels in Norway (0.9%), followed by Luxembourg and

Table 6 Countries with the highest/lowest levels of SDG indicators in the initial and the recent year

SDG	17	16	13R	12	11	10	9	7	1
Initial (H)	MT, DK, BG, NL, CY	FI, DK, SE, NO, NL	NO, SE, FI, LT, AT	NL, LU, UK, MT, FR	DE, AT, BE, NL, SE	DK, SK, NO, SE, SL	FI, SE, DK, DE, AT	BG, PT, CY, RO, PL	BG, RO, LT, PL, HR
Recent (H)	LT, SL, GR, BG, HR	DK, FI, SE, NO, NL	NO, SE, FI, LT, AT	IT, NL, UK, LU, ES	DE, AT, FI, SL, BE	FI, CZ, NO, SL, SK	SE, AT, DE, DK, FI	BG, LV, GR, CY, PT	BG, RO, GR, LV, IT
Initial (L)	DE, SE, BE, ES, FR	HR, RO, IT, BG, GR	NL, BE, LU, UK, MT	FI, LT, EE, BG, RO	CY, LT, EE, MT, HR, RO	RO, PT, LT, BG, GR	LT, RO, SK, BG, CY	SE, NL, FI, NO, LU	NO, LU, CZ, NL, SE
Recent (L)	SE, BE, FR, DE, LU	RO, HU, IT, GR, BG	CY, BE, NL, MT, LU	FI, EE, LT, RO, BG	HR, CY, GR, RO, MT	BG, LV, RO, LT, ES	LV, MT, CY, RO, LT	SE, NL, FI, LU, NO	NL, DK, FI, NO, CZ

Note 1: In all the fields, the countries are ordered according to the indicator values: from the highest to the lowest ones

Note 2: For countries the official country codes are used; H—highest, L—lowest

Note 3: The same abbreviations for countries as in Table 3 are used

Source: Eurostat (2018a); author's elaboration

Finland (both 1.7%), the Netherlands and Sweden (both 2.6%) and Denmark, Estonia, and Austria (all three 2.7%) in 2016. Luxembourg was the best-performing country in 2007 with its share of 0.5% of population, but it increased by 1.2 p.p. Denmark showed a relatively high share in 2007 (10.3%), but the drop was great as well (by 7.6 p.p.). The highest decline occurred in Bulgaria and Romania, while Bulgaria is still showing the highest share (39.2%). The share of Romania in 2016 is the seventh highest (13.8%) following Bulgaria, Lithuania (29.3%), Greece (29.1%), Cyprus (24.3%), Portugal (22.5%), and Italy (16.1% of population).

For SDG10, i.e., the Gini coefficient of equalized disposable income, the lower the values, the lower is the inequality achieved. In both years, Slovenia and Slovakia showed among the lowest levels: Slovenia in 2007 (23.2) and Slovakia in 2016 (24.3). Overall, all five Northern countries showed relatively low levels in both years (below the average values) that confirms the best results of cluster 4 in this indicator. However, Sweden, the second best-performing country in 2007 with a coefficient of 23.4, showed the highest increase in the overall sample (by 4.2). Currently, the three best-performing countries are the above mentioned Slovakia, followed by Slovenia (24.4), and Norway (25). The CR, Belgium, and Austria also showed low inequality in both years and the Netherlands in the recent period. The highest inequality was shown by Bulgaria in the recent and in Romania in the initial year (both: 38.3 in the

corresponding year). Romania showed the highest drop in the sample (by 3.6), but the coefficient of Bulgaria showed one of the highest increases (by 3). All four Southern countries showed high levels (above the average levels). Although those of Spain and Italy were slightly lower in the initial period (31.9 and 32, respectively), increases occurred in these countries. All the previous indicators represent the social dimension of SD, or socio-energy aspects, while the latter is the case for SDG7.

For SDG 9 represented by Gross domestic expenditure on R&D, the highest rates exceeding 3% of GDP in 2016 were achieved by Sweden (3.25%) and Austria (3.09%) and they are followed by Germany (2.94%), Denmark (2.87%), and Finland (2.75%). In Finland and Sweden, the shares decreased (from 3.35 and 3.26, respectively), but in the remaining countries they increased. Austria showed the highest increase in the overall sample, while Finland showed the highest decrease (0.67 p.p. and -0.6 p.p., respectively). In 2016, except for Slovenia, the CR, Estonia, and Hungary, the remaining new member countries showed ratios lower than 1% of GDP, while Latvia (0.44%), Romania (0.48%), and Cyprus (0.5%) showed the very lowest shares. This is evidence of the best results achieved by cluster 4 and of the poorest performance of cluster 2 in this indicator representing the economic dimension of SD and the prospects for improving the performance in other dimensions, along with the possibilities of decoupling.

The following three indicators are important representatives of the environmental dimension of SD. As regards SDG11, in both years the Recycling rate of municipal waste was the highest in Germany (63.2% and 66.1% in 2007 and 2016, respectively) and the second highest in Austria (60.2% and 57.6% in 2007 and 2016, respectively). The Benelux countries, Sweden, Finland, and Denmark showed high rates in both years. Finland also showed a significant increase (by 19.3 p.p.), but the highest increase was shown by Lithuania (by 40.5 p.p.). On the other hand, the highest drop occurred in Norway (by 4.4 p.p.) that showed one of the highest share in 2007 (42.6%) as well. The new member countries and Southern countries showed low and medium rates in 2007 (only Spain's rate exceeded the average). This is also the case for 2016, but the rates of Poland, Italy, and Lithuania were higher (above the average), that of Slovenia was even fourth highest in the sample (54.1). Accordingly, the highest means and medians are typical of cluster 1 followed by cluster 4 in both years, while their lowest levels were achieved in cluster 2 in 2016 and in cluster 3 in 2007.

The decoupling indicator of Resource Productivity (representing SDG12) is crucial for achieving SD. In 2016, Italy showed the highest Resource Productivity (3.998 PPS per kg). This was followed by the Netherlands (3.99 PPS per kg), the UK (3.63 PPS per kg), Luxembourg (3.57 PPS per kg), and Spain (3.19 PPS per kg), all showing levels above 3 PPS per kg. The lowest levels in both years are typical of Bulgaria, Romania, Latvia, Estonia, Finland, and Poland, all showing the lower level than 1 PPS per kg in 2016. Another three countries showed lower levels than 1 PPS per kg in 2007, i.e., Ireland, Slovenia, and Cyprus. However, all three countries showed significant increases, while that of Ireland was the third highest in the sample following Italy and Spain. Accordingly, cluster 1 showed the best performance. Cluster 2 showed the poorest performance in the initial period because it includes

only Bulgaria that showed the lowest Resource Productivity. In the recent period, the mean and median of Resource Productivity in cluster 4 showed the lowest value. It is the lowest in Finland (0.96 PPS per kg), the indicator is also relatively low in Norway (1.27 PPS per kg) and Sweden (1.51 PPS per kg), and medium in Denmark (1.74 PPS per kg).¹ All these levels are below the average of the sample.

As regards the SDG13R indicator, the highest levels were shown by Norway (60.1 (2007) and 69.4% (2016)), followed by Sweden (44.2 (2007) and 53.8% (2016)), Finland (29.6 (2007) and 38.7% (2016)), Latvia (29.6 (2007) and 37.2% (2016)), Austria (27 (2007) and 33.5% (2016)) in both years, and Denmark in the recent period (32.2% in 2016). The latter showed a lower level in 2007 (17.8%), but the highest increase in the sample (14.4 p.p.). The other two Baltic countries, Estonia and Lithuania, showed relatively high shares as well (above the average levels in both years). Moreover, all Northern and Baltic countries, along with Bulgaria, but also Spain and Italy, showed great increases between 2007 and 2016. The lowest shares are typical of the Benelux countries, Malta, Cyprus, the UK and Ireland, while they also showed low increases (except for the UK where the increase was higher), along with Slovakia and Poland (in no country of the sample did the share decrease).

As regards the SDG16 indicator, all four Northern countries showed the highest levels in both years; Denmark exceeded Finland in 2016 and they are followed by Sweden and Norway in both years. Other countries with a high performance are the Benelux countries, the UK, and Germany. A low performance is a characteristic of a number of new member countries, with the lowest shown by Bulgaria, along with Greece and Italy. Cyprus showed a relatively good performance in 2007, but the highest drop of the score in the sample as well. Currently, Estonia, followed by Poland and Slovenia, are the best-performing new member countries in 2016.

The SDG17 indicator, i.e., Shares of environmental taxes in total tax revenues, was higher than 10% in two countries in 2016 (Latvia: 11.69%; Slovenia: 10.57%) and in three countries in 2007 (Malta: 10.75%; Denmark: 10.21%; Bulgaria: 10.11%). The lowest shares are in Luxembourg in the recent years (4.58%) and in Germany in both years (5.81% (2007) and 4.77% (2016)), France (4.4% (2007) and 4.89% (2016)), Belgium (5.71% (2007) and 4.99% (2016)), Sweden (5.59% (2007) and 5.05% (2016)), and Spain (4.86% (2007) and 5.54% (2016)). The highest increase was achieved by Latvia (4.47 p.p.) followed by Greece (3.3 p.p.), and the highest drop by Luxembourg (-2.49 p.p.), followed by Malta (-2.22 p. p). It is difficult to assess the effects of environmental taxes. It requires a detailed analysis, and their particular composition and tax rates are also crucial for SD. Some of the analyzed countries can have as high rates for environmental as for labor taxes. Then it can be at least claimed that the application of the revenue neutrality principle, or an increase in environmental taxes in relation to labor taxes generally, should stimulate decoupling and SD in general. More particularly, it can affect the relationships

¹The other non-EU country, Switzerland, showed the absolutely highest level of the indicator in both years (3.33 and 4.07 PPS per kg in 2007 and 2016, respectively). It was excluded from the analysis due to the missing data for several indicators.

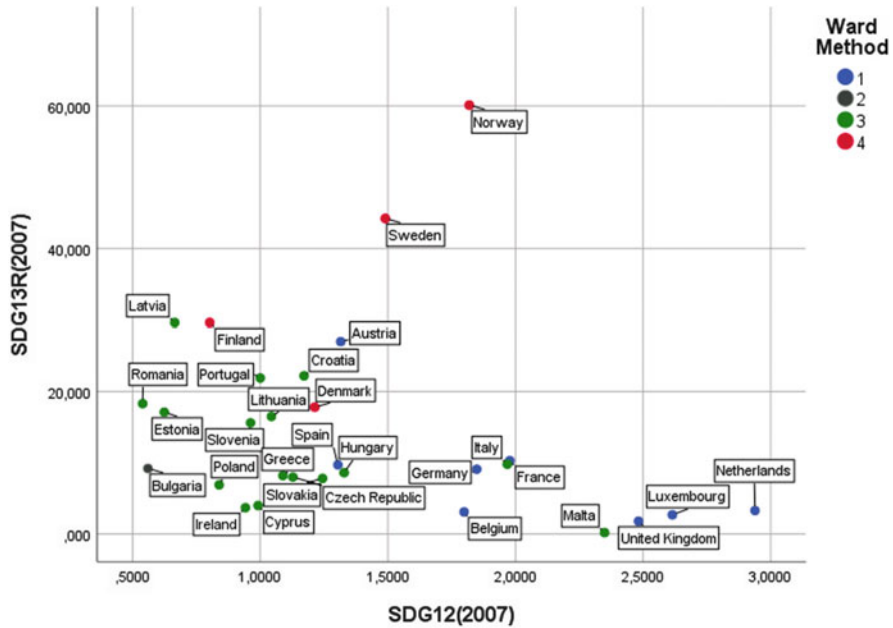


Fig. 3 Resource Productivity in PPS per kilogram (SDG12) and Share of renewable energy in gross final energy consumption (%) (SDG13R), 2007 (Source: Eurostat, 2018a; author's elaboration)

between the economic and the environmental pillar in such a way so as to encourage the shifts toward SD. This is reflected in the SDG17 indicator. There is no clear pattern and similarities as regards the allocation to clusters, but, on average, cluster 2 showed the highest shares, as Bulgaria showed the third highest share in 2007 and in 2016. Except for Spain, all cluster 2 countries also showed medium shares: Lithuania and Portugal (the former slightly below and the latter slightly above the average level) or relatively high shares (the remaining countries included in cluster 2). The values in cluster 4 are scattered, with Denmark showing the highest shares (8.59% in 2016) and Sweden the lowest (5.05% in 2016). On the other hand, Sweden showed the highest shares of labor taxes (57.64% in 2015). Next, the relationships between two crucial indicators mainly representing the environmental pillar, particularly the aspects related to decoupling, i.e., the SDG12 indicator, and climate and energy issues, i.e., the SDG13R indicator, are examined more in detail. The focus is predominantly on the distribution of their levels among clusters.

In both Figs. 3 and 4 it can be seen that the cluster 1 countries are predominantly located in the bottom right corner of Figs. 3 and 4. As regards Fig. 3, several cluster 3 countries are also located in this part, such as Malta and Italy, both showing high Resource Productivity and the lowest and medium Shares of renewable energy, respectively (Malta: 0.2%; Italy: 9.8% in 2007). The bottom right corner looks slightly different in the recent period (Fig. 4). Italy achieved the highest Resource

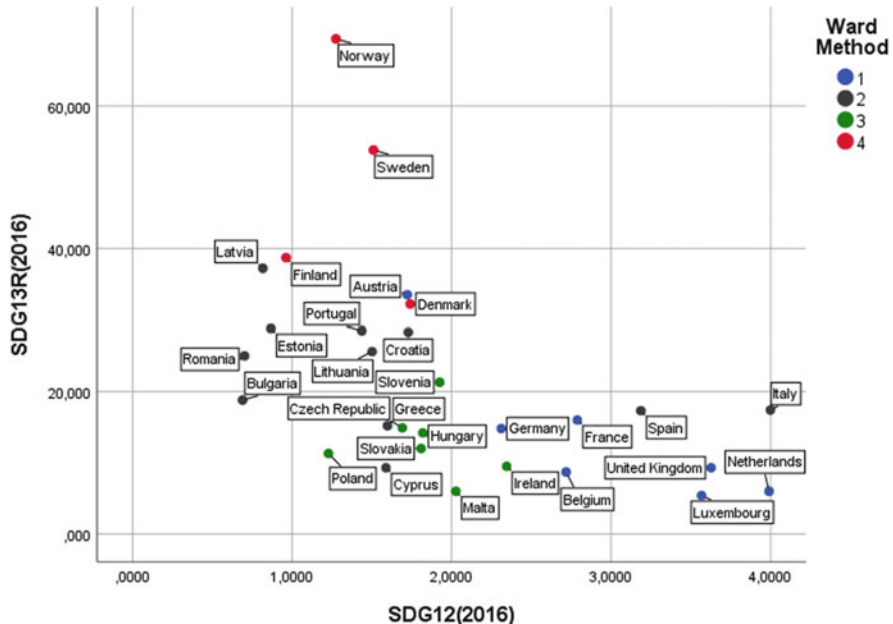


Fig. 4 Resource Productivity in PPS per kilogram (SDG12) and Share of renewable energy in gross final energy consumption (%) (SDG13R), 2016 (Source: Eurostat, 2018a; author's elaboration)

Productivity in the sample and this country shifted to cluster 2 together with Spain (the latter from cluster 1). Both countries showed similar medium Shares of renewable energy (both below the average levels) and high Resource Productivities. The increase in the latter indicator between 2007 and 2016 was the highest in Italy and the second highest in Spain. These two cluster 2 countries are located in the bottom right corner in 2016 along with similar cluster 1 countries as in the initial period: the Benelux countries, the UK, Germany, and France. In addition to Malta, the other cluster 3 country, Ireland, is located there in 2016. Ireland achieved the third highest increase in Resource Productivity between 2007 and 2016, following Italy and Spain. All the indicated countries achieved relatively high Resource Productivities and low (Malta, Benelux, the UK, and Ireland) or medium, but still below average (Germany, France, Spain, and Italy) Shares of renewable energy. In the upper middle part, there are two cluster 4 countries—Norway and Sweden, both showing the highest Shares of renewable energy, while in both countries these shares significantly increased between 2007 and 2016 (the fourth highest increase in Sweden and the fifth highest in Norway in the overall sample). On the other hand, Norway showed the highest decrease in Resource Productivity and Sweden the lowest increase between the years. Thus, in 2016 their Resource Productivities are lower than average as compared to 2007, when they achieved higher than average levels in the overall sample. The remaining cluster 4 countries also showed relatively high

Shares of renewable energy, but their Resource Productivities are below average in both years and, moreover, in Finland, among the lowest. In the left part, the cluster 3 countries in 2007 (Fig. 3) and cluster 2 countries in 2016 (Fig. 4) prevailed. Bulgaria, Romania, Latvia, and Estonia are the countries located in the left corners with the lowest Resource Productivities in both years, but showing relatively high Shares of renewable energy. Only those of Bulgaria are below average levels, while those of Latvia are one of the highest in the sample.

Although no clear relationships were observed between the two indicators, some patterns were detected in respect to the classification of countries into four clusters. Overall, rather negative relationships between the SDG12 indicator and the SDG13R indicator can be seen in the sample, while the correlation coefficient (r) is higher in 2016 (-0.242 (2007); -0.503 (2016)). The absolute value of the coefficient increases when Norway and Sweden are omitted ($r = -0.565$ (2007); -0.583 (2016)). It is crucial to examine relationships between the crucial indicators reflecting the SD aspects to reveal the factors determining SD and the possible trade-offs.

4.3 Overall Assessment of the Results

It is concluded that cluster 4 is the most sustainable cluster in both years and cluster 2 had the worst performance. Between 2007 and 2016, the composition of the clusters changed, except for cluster 4. The major changes occurred between clusters 2 and 3. In cluster 1 the number of countries was reduced by one country—Spain, while all the other developed EU countries remained in this cluster. Cluster 4 contains the four developed Northern countries in both years. In cluster 3, which contained almost all the new member countries and Southern countries, the number of countries was significantly reduced from 16 to 7, while all of them shifted to the worst-performing cluster, cluster 2. These countries are the three Southern countries: Greece, Italy, Portugal, the three Baltic countries, and the other less developed new member countries: Croatia, Cyprus, and Romania. Thus, in cluster 3, the other new member countries remained: the CR, Hungary, Slovenia, Slovakia, Poland, and Malta, along with Ireland.

To sum up, the majority of changes in the indicator values in the four clusters between 2007 and 2016 indicated the shifts toward higher sustainability, especially for the three indicators representing the environmental dimension of SD, i.e., SDG11, 12, and 13R, where the values increased in all the clusters. The changes toward lower performance and sustainability were predominantly observed in cluster 4, more rarely in cluster 1 that are both the best-performing clusters. However, these changes can be assessed as slight. Another important development is the shift of countries to cluster 2 from cluster 1 (Spain) and from cluster 3 (9 countries: 3 Baltic countries, three Southern countries, Cyprus, Croatia, and Romania), while cluster 2 is still be evaluated as the worst-performing cluster.

Comparing the results to those of the crucial studies included in Sect. 2, there are some similarities, but also significant differences in respect to the classification of countries into the clusters, which predominantly depends on the indicators and the periods included (e.g., Slovakia and Slovenia; Bulgaria and Romania; Greece and Portugal; Germany, France, and the UK; or Northern countries are included together in the same clusters). It can be seen that the Northern countries often show the highest performance, especially Sweden, but the other three countries too. This can be confirmed by this work where all these countries are assigned to the best-performing cluster, cluster 4. Luxembourg, the Netherlands, the UK, and Cyprus were also assessed as the best performers. Moreover, Latvia was evaluated as the good performer in the environmental dimension. The first three countries are included in the second best-performing cluster, cluster 1, where the major deficiency is the low Share of renewable energy, but which has very good results in the majority of other indicators. On the other hand, Cyprus and Latvia showed poor results in more indicators, such as SDG1 (especially Latvia), SDG7 (especially Cyprus), SDG9 (both), SDG10 (Latvia), SDG11 (both), SDG12 (especially Latvia), and SDG13R (Cyprus). However, the great performance of Latvia in Share of renewable energy supports its performance in the environmental dimension and both countries also showed high Shares of environmental taxes in total tax revenues. Both countries were shifted to the worst-performing cluster, cluster 2, in 2016, from cluster 3, where they were included in 2007.

The countries that often showed a low performance in analyzed studies (Sect. 2) are Bulgaria, Romania, the Baltic countries, Slovakia, and Hungary. In this work, the first country is included in the worst-performing cluster 2 in both years. Romania and Baltic countries were shifted to this cluster from cluster 3 in the recent year. Hungary and Slovakia are included in cluster 3 in both years. These countries showed a low performance in a number of indicators, especially Bulgaria and Romania. In particular, in the SDG1, 7, and 10 indicators four countries showed poor results: Bulgaria, Romania, Latvia, and Lithuania. Besides these countries, for the SDG9 indicator also Slovakia and for the SDG12 indicator also Estonia showed poor results, while Lithuania showed slightly higher Resource Productivities. For the SDG11 indicator, it was especially the case for Romania, Latvia, and Slovakia. Lower levels for the SDG13R indicator were shown by Slovakia and Hungary. In the case of the SDG16 indicator, Bulgaria and Romania performed the most poorly, while Hungary (especially in the recent year) and Slovakia also performed badly. Thus, similarities can be confirmed, especially in the cases of Bulgaria, Romania, Latvia, and Lithuania, and to a lesser extent in Slovakia and Hungary. Overall, Slovakia, Hungary, and Estonia did not show such poor results in this work in the majority of the indicators included. On the other hand, for Latvia the results are contradictory to some extent.

5 Conclusions

The aim of this chapter was to form clusters from a group that includes the EU countries plus Norway using their sustainability performance measured by selected indicators included in the EU SDG indicator set. The indicators for all three pillars of SD were applied and special attention was paid to the crucial indicators reflecting decoupling, climate, and energy targets. The levels of sustainability (performance) were evaluated in the sample of 29 countries, i.e., the 28 EU countries and Norway, according to their allocation to particular clusters. The path of SD was assessed according to the changes in the allocation to clusters and the indicator values between two analyzed years. Four clusters were created in the initial year (predominantly 2007) and the recent year (primarily 2016). Sustainability and SD are assessed according to performance in all the dimensions simultaneously, i.e., a lack of progress in one dimension cannot be offset by a good performance in other dimensions.

Cluster 1 is composed of the more developed EU countries, i.e., the Benelux countries, Austria, Germany, France, and the UK, while Spain is included just in the initial year. Cluster 2 includes only Bulgaria in the initial year, but all four Southern countries are included in the recent year. Spain shifted from cluster 1 and the other three countries from cluster 3. Moreover, all three Baltic countries shifted to cluster 2 in the recent year from cluster 3, where they were included in the initial year. This is also the case for Cyprus, Croatia, and Romania. The other seven cluster 3 countries remained there: the CR, Hungary, Ireland, Malta, Poland, Slovenia, and Slovakia. Because no country was added to this cluster in the recent period, the number of countries decreased from 16 to 7. Cluster 4 has the same composition in the initial and the recent year; it is composed of four Northern countries.

For the three crucial social indicators, which are People at risk of poverty or social exclusion, Population unable to keep home adequately warm and Gini coefficient of equalized disposable income, representing SDG1, 7, and 10, respectively, while the SDG7 indicator also reflects socio–energy aspects, cluster 4 is the best-performing cluster and cluster 2 showed the lowest performance in both periods. Similar results are typical of the SDG9 indicator, i.e., gross domestic expenditure on R&D, reflecting the economic dimension of SD and indicating the possibilities of decoupling and improvements in all the dimensions in the future. The highest means and medians, and thus the highest performance, were achieved by cluster 4 and the worst performance by cluster 2 in both years. The changes of means and medians for these indicators between the years predominantly reflect the shifts toward highest sustainability levels, except for those having taken place for both median and mean in cluster 4 for the SDG1 indicator, those in cluster 4 and cluster 1 for the SDG10 indicator and medians in cluster 4 for the SDG7 and SDG9 indicators. Thus, the most sustainable cluster and the second best-performing cluster showed some changes toward lower sustainability levels, while cluster 4 did not even change its composition.

For the three indicators representing the environmental dimension of SD, i.e., Recycling rate of municipal waste (SDG11), Resource Productivity (SDG12), and Share of renewable energy in gross final energy consumption (SDG13R), the results are contradictory to some extent. For SDG11 and SDG12, the highest performance is shown by cluster 1, but this cluster showed a relatively low average Share of renewable energy (SDG13R). On the other hand, cluster 4 showed the highest performance in this indicator, the second best performance in the SDG11 and SDG12 indicators in the initial period, but the lowest performance in the latter indicator in the recent period. For all three indicators representing the environmental dimension of SD, the means and medians increased in all clusters, which could indicate a shift toward higher sustainability and a shift closer to the SD path. A slightly negative relationship was observed between the values of the SDG12 and the SDG13R indicators in the sample. However, no clear patterns were detected.

Finally, SDG16 and SDG17 were evaluated together as the representatives of the institutional dimension, although the SDG17 indicator also reflects the environmental pillar of SD. The highest means and medians and the best performance in the Corruption Perceptions Index (SDG16) were in cluster 4 and the second highest in cluster 1 in both years. The poorest performance is shown by cluster 2. For Shares of environmental taxes in total tax revenues (SDG17), the highest levels are shown by cluster 2 and the lowest levels by cluster 1 in both years. For the SDG16 indicator, the only slight decreases in the mean and median occurred in the best-performing cluster, cluster 4. As regards the SDG17 indicator, the means and medians in clusters 1 and 2 and the mean in cluster 4 declined between the years. On average, cluster 4 can then be evaluated as the best-performing cluster in the institutional dimension, showing the best results for the SDG16 indicator; although the values for the SDG17 indicator are lower. Moreover, the SDG17 indicator is important for SD due to the revenue neutrality principle, it does not reflect environmental and labor tax rates.

Overall, the majority of changes in the indicator values in the four clusters between 2007 and 2016 indicated shifts toward higher sustainability, especially for the three indicators representing the environmental dimension of SD, i.e., SDG11, 12, and 13R, where the values increased in all the clusters. Changes toward lower performance and sustainability were predominantly observed in cluster 4 and more infrequently in cluster 1, which are the two best-performing clusters. However, these changes can be assessed as slight. Another important development is the shift of countries to cluster 2 from cluster 1 (Spain) and from cluster 3 (9 countries: three Baltic countries, three Southern countries, Cyprus, Croatia, and Romania).

It can be concluded that cluster 4 showed the highest performance and sustainability according to most indicators, although slight changes toward higher unsustainability occurred in this cluster predominantly in the economic, social, and institutional dimensions. This cluster did not change its composition between the years and thus the changes, but also its highest performance, are most visible. Cluster 1 was assessed as the second best-performing cluster. Cluster 2 changed the composition significantly (from 1 to 11 countries) and this is the cluster having the lowest average performance and sustainability in both years. The crucial shifts between the compositions of the clusters predominantly took place between clusters 2 and 3. The

assessment of these changes in relation to sustainability is not unambiguous, as many of the countries from both clusters improved their performance. However, cluster 3 shows better results in both years in the majority of the indicators and the changes between the years did not mostly lead to improving the position of cluster 2 in comparison to cluster 3, except for the SDG13R indicator. Moreover, the changes also led to its worsening, such as in the case of the SDG10 and SDG11 indicators. The shift of countries from cluster 3 to cluster 2 can therefore be evaluated as a shift toward lower sustainability when the average values in the recent period are considered. The challenge for the future is to improve the methodologies of SD and decoupling measurement, including the possibilities to apply cluster analysis and its appropriate methods. The methodology related to the constructions of quality SD indicators and indices is also a challenging task.

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An Investigation of Turkey's Competitiveness on Different Products Groups in Automotive Sector via Revealed Comparative Advantage Index



Semanur Soyyiğit and Kiymet Yavuzaslan

Abstract Competitive power in international trade is one of the most desirable targets of countries in today's globalized world. Thus, the importance of international competitiveness that has been a fundamental issue since the rise of the international economic theory is increasing for various products. Within this scope, it is so prominent to analyze product groups in which countries have comparative advantages from past to present in order to detect the problems and to determine the existing situation. In this context, with reference to the importance of countries in the existing global structure, investigation of comparative advantage of Turkey in the production of motor vehicles constitutes the subject of this study. Revealed Comparative Advantage (RCA) index, which has been suggested by Liesner first and then developed by Balassa, is used to determine the comparative advantage of Turkey in the production of motor vehicles from 1989 to 2016. Findings indicate that new competitors exist in automotive sector and that the competitiveness of Iran and the Eastern European countries will be determinant in the medium- and long-term position of the Turkish automotive industry in global markets.

Keywords International trade · Revealed comparative advantage index · Motor vehicles

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1 Introduction

The concept of comparative advantage means that the tendency for countries to export those commodities, which they are relatively adept at producing, vis-à-vis the rest of the world. In other words, if a country can produce a good at a lower relative cost than the other countries, then with trade, that country should devote more of its scarce resources to the production of that particular good. Through trade, that country can obtain other goods at a lower price (opportunity cost), in exchange for the good in which it has a comparative advantage (Obadi 2017). The international trade is increasing competitively in the global world and it is important to measure the comparative advantages of Turkey in exporting products. There are many indexes to measure the comparative poverty of countries. While the indexes measuring the revealed comparative, advantages have been reviewed and improved after Balassa, the index of Balassa (called the RCA index) is the most used index in the literature. Balassa (1965) assumed that the real shape of the comparative advantage could be observed from the data after the trade. The RCA index is used to measure the relative importance of a product in a country's export composition relative to that product's relative importance in world trade or any country.

The automotive industry is described as a “key” sector for developing countries; because this industry includes parts, fuel, service, insurance, and transportation. After 1980s vehicle manufacturing companies introduced the innovation and difference in the models and brought a movement to the market in Turkey. The Turkish automotive sector has been established in the 1990s, because of the investments of the world leading automotive brands in Turkey. Turkey's automotive sector, with new products and production capacity investments and exports continue to rise in the world market each year. Turkey has one of the highest amounts in automotive production—14th in the world ranking in 2016—and the production is increasing day by day.

In this study, it is aimed to analyze the motor vehicles production of Turkey, comparatively via revealed comparative advantage (RCA) concept and method. The motivation of the present study is to evaluate the position of Turkey in global markets and its change over time since the sector is one of the most competitive sectors of Turkey. The contribution of the chapter is the comparative overview of the Turkish automotive sector with existing and potential competitors. The structure of the chapter is the following. In the section “Literature review on RCA Index for Turkey,” there is a brief review of the relevant literature. After literature review in the introduction, methodological explanation and introduction of the data will be given in the following section. In the last section, findings of the analysis provide a discussion of the results in comparative advantages of the Turkish automotive sector; because of the competitors of Turkey in this sector, some forecast implications are also drawn.

2 Literature Review on RCA Index for Turkey

In the literature, several techniques are used to measure the weak and strong sectors of a country. One of the most widely used methods involves the concept of “revealed comparative advantage” developed by Balassa (1965). The Balassa index basically measures normalized export shares, with respect to the exports of the same industry in a group of reference countries. Although the pros and cons of the Balassa index are still debated in the literature, it stands as the most widely used revealed comparative advantage (RCA) index. In the literature, numerous empirical studies have used the Balassa index to identify a country's strong sectors. The index is not satisfactory as a cardinal or ordinal measure but provides a useful tool in detecting comparative advantages of Turkey in particular sectors. For many countries, there are many studies of the exploited comparative advantage method involving international trade with different sectors and country groups (Hillman 1980; Bowen 1983; Serin and Civan 2008; Kaitila 1999; Küçükahmetoğlu 2000; Bojnec 2001; Utkulu and Seymen 2004; Çoban and Kök 2005; Seymen and Şimşek 2006).

Güran (1990) applied the RCA index to all the sectors and subsectors of Turkey, in general, against the European Union (EU) countries and it is disclosed comparative advantages for the year 1988. In conclusion, Turkey had a comparative advantage in industrial products while it has disadvantages of technological products. Togan (1990) provided the comparative advantages of Turkey in international trade for the 1980–1988 period. In this study, commodities with explanatory comparative advantage of Turkey were examined, such as clothing items, manufactured fertilizers, iron and steel, fixed vegetable oils, various edible oils, processed animal and vegetable oils, sanitary ware, and travel goods. On the other hand, the items having the disclosed comparative disadvantage of Turkey were furniture, various manufactured goods, wood, timber and mushrooms, oilseeds, drinks, transportation vehicles, leather, leather—furs, paper clay, and rash. Karakaya and Özgen (2002) examined the effects of the trading on behalf of economic integration between Turkey and the EU. They determined that the export structures of the EU and Turkey were different and full membership of Turkey would affect negatively the exports of the southern countries. Also, Kutlu (2003) has investigated the competitiveness against the EU countries after Turkey's Customs Union Agreement. In conclusion, Kutlu (2003) stated that Turkey was the overall agricultural and industrial competitiveness in certain sectors in the main sectors.

Even though there are various papers existed by using RCA to measure the comparative advantage of Turkey against the other countries, also some studies assumed that the RCA of Turkey from the sectoral perspective. For example; Akgüngör et al. (2002) analyzed the competitive power of the Turkish fruit and vegetable processing industry in the EU market. Turkey has a comparative advantage in exports of citrus fruits against Portugal and Greece. On the other hand, Turkey has not competitiveness in the tomato processing industry. Altay and Gacaner (2003) focused on the textile and apparel sector competitiveness of China and Turkey, against the EU and the USA. The Turkish textile and apparel sector has a comparative advantage over China in the EU and US markets. At the same time,

Turkey has higher competitiveness compared to the EU market in the US market. Konyalı and Emirhan (2004) studied the trade structure and performance of the Turkish glass and ceramic industry in the EU market. According to this study, Turkey had a competitive advantage in glass and ceramic industry.

The labor force has been cheaper than many countries in the EU (Yılmaz and Ergün 2003). Because of the cheaper labor force and other advantages, Turkey has a special place in the production of motor vehicles for the EU automotive industry. After the Customs Union Agreement, many European automotive brands have moved their production to Turkey.

In Table 1, it can be seen that the production amount of motor vehicles is stable in 2012–2013–2014, especially in 2015 the motor vehicle production of Turkey increased significantly. Motor vehicle production increased from 431,000 in 2000 to 1,485,927 in 2015 and average growth rate of production was realized as 12,7% during this 16-year period (Pişkin 2017: 8). The total production of automotive industry in Turkey in 2016 reached nearly 1.5 million vehicles, increased by 9.4%. With this production value, the Turkish automotive sector ranks 14th in the world in production. But there are new competitors in automotive sector against Turkey such as Iran and Eastern Europe. On the other hand, Iran is the fastest growing country in the global automotive sector in 2016 with a registered growth rate of 18.6%. In addition, the automotive sales in Iran are expected to increase by more than 10% over the next 5 years.

3 Methodology

Comparative advantages, one of the first concepts taught in the field of international economics, is still an important concept that is used both theoretically and empirically. In this sense, it is one of the important concepts of modern economics. In Ricardian comparative advantages model that contains two-country and two-good, it is said that each country should specialize in the production of good, which is produced in efficient way comparatively. In Ricardo's theory of comparative advantages, it is said that there will be a profitable trade for both countries in the model in the case when one of the countries exports the good it produces in a comparatively advantageous way and imports the other good from the other country. Factor Endowment Theory, which is also known as Heckscher–Ohlin model dedicated to the economists who developed it, is revealed at the beginning of the twentieth century to fill the deficiency stemming from superficiality of Ricardian comparative advantages theory. This model is based on the assumption that there are two factors of production, two countries and two goods, and that factor endowment of these goods and countries are different. Accordingly, labor-abundant country should specialize in the production of labor-intensive good, while capital-abundant country specializes in the production of capital-intensive good. In this case, the conditions for a profitable foreign trade among the countries will be provided and resource

Table 1 Motor vehicle production of world

Rank	2012		2013		2014		2015	
	Country	Production	Country	Production	Country	Production	Country	Production
1	China	19,271,808	China	22,116,820	China	23,731,600	China	28,118,790
2	USA	10,335,765	USA	11,066,430	USA	11,660,700	USA	12,198,130
3	Japan	9,943,077	Japan	9,630,181	Japan	9,774,665	Japan	9,204,590
4	Germany	5,649,260	Germany	5,718,222	Germany	5,907,548	Germany	6,062,562
5	Korea	4,561,766	Korea	4,521,429	Korea	4,524,932	India	4,488,965
6	India	4,174,713	India	3,898,425	India	3,844,857	Korea	4,228,509
7	Brazil	3,402,508	Brazil	3,712,380	Mexico	3,368,010	Mexico	3,597,462
8	Mexico	3,001,814	Mexico	3,054,849	Brazil	3,146,386	Spain	2,885,922
9	Canada	2,463,364	Thailand	2,457,057	Spain	2,402,978	Canada	2,370,271
10	Thailand	2,429,142	Canada	2,379,834	Canada	2,394,154	Brazil	2,156,356
11	Russia	2,233,103	Russia	2,192,245	Russia	1,887,193	France	2,082,000
12	Spain	1,979,179	Spain	2,163,338	Thailand	1,880,587	Thailand	1,944,417
13	France	1,967,765	France	1,740,220	France	1,821,464	UK	1,816,622
14	UK	1,576,945	UK	1,597,872	UK	1,598,879	Turkey	1,485,927
15	Czech Republic	1,178,995	Indonesia	1,206,368	Indonesia	1,298,523	Czech Republic	1,349,896
16	Turkey	1,072,978	Czech Republic	1,132,931	Czech Republic	1,251,220	Russia	1,303,989
17	Indonesia	1,052,895	Turkey	1,125,534	Turkey	1,170,445	Indonesia	1,177,389
18	Iran	1,000,089	Slovakia	975	Iran	1,090,846	Iran	1,164,710

Source: UN Comtrade (2018)

allocation at an effective level will be realized since each country will specialize in the production of the goods it produces at the cheapest price (Seyidoğlu 2015).

Though passing of years after these traditional models, comparative advantages concept has not lost its significance. In fact, it has become even more critical over the years with the increasing importance of globalization. Thus, theoretical studies on the comparative advantages of countries are also heavily studied within modern theories.

In this sense, the study by Liesner (1958) is accepted as the first empirical study in the field of RCA. The simple formulation developed by Liesner to measure RCA is as follows (Makochekanwa 2007):

$$RCA = \frac{X_{ij}}{X_{nj}} \quad (1)$$

where X_{ij} represents export of good j by country i and X_{nj} represents export of good j by a group of countries or all world countries.

After that simple measure developed by Liesner (1958), a frequently used one in the literature was developed by Balassa (1965). The formulation of the measure developed by Balassa (1965) is given as follows (Makochekanwa 2007: 6):

$$RCA_{ij} = \frac{\left(\frac{X_{ij}}{X_i}\right)}{\left(\frac{X_{wj}}{X_w}\right)} = \frac{\text{Share of good } j \text{ in total export value of country } i}{\text{Share of good } j \text{ in total world export}} \quad (2(2))$$

If RCA index calculated via Eq. (2) is higher than 1, it is said that country i has comparative advantage in trade of good j . However, it is said that country i has comparative disadvantages in trade of good j if the RCA index value is lower than "1." Usage of RCA index has some advantages and some disadvantages (Makochekanwa 2007). One of its advantages is expressed as the fact that this index allows measuring the competitive power of a country in terms of a specific good and the results are compatible with the relative factor endowment of the country. It is also an advantage that the countries' trade data are sufficient for the calculation, and the need for cost data that are hard to access is not required. On the other hand, this index may not reflect the effects in factor endowment generated by the policies applied. In other words, the application of different regimes rather than factor endowment of countries may cause them to have different RCA indices. However, RCA indices may not reflect the real reason for this difference. However, despite this disadvantage, the RCA index is a widely used measure to analyze comparative advantages of countries in terms of various groups of goods. In this study, comparative advantage of Turkey in terms of motor vehicles sector from 1989 to 2016 is analyzed via RCA index.

It is a known fact that Turkey has become an important exporter country, especially after the Custom Union Agreement in 1996, due to the investments from East Asian countries that desire to reach the European market. The effects of these developments on some subgroups of this sector are analyzed in this study.

Table 2 Explanation of the data

SITC Rev. 3 code	Groups	Explanatory notes
78	Road vehicles (including air cushion vehicles)	
781.2	Motor vehicles for the transport of people, n.e.s.	
782.1	Motor vehicles for the transport of goods	Dumpers designed for off-highway use Motor vehicles for the transport of goods, n.e.s.
783	Road motor vehicles, n.e.s.	Motor vehicles for the transport of ten or more people, including the driver Road tractors for semitrailers
784	Parts and accessories of the motor vehicles of groups 722, 781, 782, and 783	Chassis fitted with engines, for the motor vehicles of groups 722, 781, 782, and 783 Bodies (including cabs), for the motor vehicles of groups 722, 781, 782, and 783 Other parts and accessories of the motor vehicles of groups 722, 781, 782, and 783 (Bumpers, brakes, and servo-brakes, gearboxes, drive-axles, etc.)
785.1	Motor cycles (including mopeds) and cycles fitted with an auxiliary motor, with or without side-cars; side-cars	

Source: UN Comtrade (2018)

Besides, a comparison of comparative advantage of Turkey with its current competitors such as Poland, the Czech Republic, Slovakia, Slovenia, Romania, and Russia and with its potential countries such as India and China are made in the study from 1996 to 2016. Recently, it has been stated that Iran is a potential competitor for Turkey in automotive sector since there will be a big investment in this country in 2018. However, Iran could not be included in this study since the required data for this country is not available.

Before discussion of the findings, it is necessary to give some information about the data and the data source. The data have been obtained from the UN Comtrade database. Subgroups of motor vehicles sector that have been analyzed in this study are selected depending on the SITC Rev.3 classification. The definition of each subgroup can be seen in Table 2. The RCA index results for Turkey will be presented for each subsector and change of the competitiveness of the country over the period will be evaluated. Afterward, it will be compared to the index of Turkey with the indices of its competitors (such as Poland, Slovakia, Slovenia, Romania, the Czech Republic, Russia, India, and China) and the change of competitiveness among these countries from 1990s to present.

4 Findings

The investments made in the automotive sector in Turkey aimed to supply the domestic demand before 2001. A large part of the investments has been export oriented after this period and the automotive sector has achieved significant growth rates since 2013. The investments of global automotive companies have been increasing in Turkey because of being a production center for Europe and the Middle East.

It is observed in Table 3, Turkish automotive sector declined due to economic constriction of the European market in 2008–2009 and 2012–2013. The largest export market of Turkey in the automotive sector is the European market with 80% share, so the economic activity in the EU reflects directly in the automotive sector. Although the investment for the automotive sector in Turkey expected to maintain its positive trend in the future, it is estimated that a little more difficult competitive environment by the side of international investment for Turkey. While the current situation of the international investments in the Eastern European countries make these countries major competitors for Turkey, it is also expected for this investments to increase the competitiveness among the countries. Because of Iran's participation in this sector after the removal of sanctions, an important global automotive company is setting up production facilities in Iran in the recent period. First, RCA indices of Turkey in terms of different subgroups of motor vehicles sector are given in Table 4.

RCA index for Turkey in terms of all subgroups of motor vehicles industry from 1989 to 2016 is presented in Graph 1. "Road vehicles" is the main group that covers all of the subgroups (782.2, 782.1, 783, 784, and 785.1) analyzed. Thus, it can be said that it represents the overall trend. When we look at the index values, we can say that "road vehicles" group has had values higher than "1" since 2003. Thus, it indicates that Turkey has especially gained a competitive position in motor vehicles sector since 2003. "Road motor vehicles" has become higher than "1" since 1992. However, this subgroup does not display a stable increase. The RCA index values fluctuate over the period. This subgroup is also the most affected one in terms of

Table 3 Automotive industry in Turkey (Thousand)

Year	Production	Export	Import
2007	1099	820	356
2008	1147	911	306
2009	870	628	314
2010	1095	753	465
2011	1189	789	539
2012	1073	730	512
2013	1126	825	616
2014	1170	885	525
2015	1359	992	659
2016	1486	1141	681

Source: UN Comtrade (2018)

Table 4 RCA results for Turkey (1989–2016)

Years	78 Road vehicles	783 Road motor vehicles	784 Parts and accessories of the motor vehicles	7812 Motor vehicles for the transport of persons, n.e.s.	7821 Motor vehicles for the transport of goods	7851 Motor cycles and cycles fitted with an auxiliary motor
1989	0.107	0.616	0.168	0.061	0.107	0.012
1990	0.102	0.701	0.172	0.054	0.085	0.011
1991	0.108	0.773	0.159	0.075	0.024	0.014
1992	0.161	1.276	0.228	0.093	0.024	0.004
1993	0.204	2.243	0.256	0.061	0.031	0.001
1994	0.243	2.192	0.269	0.077	0.076	0.008
1995	0.376	1.928	0.363	0.244	0.212	0.076
1996	0.413	3.414	0.367	0.245	0.145	0.057
1997	0.309	2.480	0.457	0.093	0.120	0.124
1998	0.323	2.331	0.557	0.100	0.101	0.100
1999	0.564	3.127	0.604	0.488	0.135	0.095
2000	0.627	3.842	0.733	0.478	0.356	0.116
2001	0.814	4.393	0.759	0.614	1.383	0.172
2002	0.935	3.949	0.826	0.677	2.244	0.108
2003	1.089	3.838	0.821	0.866	2.800	0.172
2004	1.409	3.112	0.815	1.242	4.268	0.116
2005	1.455	4.086	0.889	1.248	4.078	0.115
2006	1.639	3.841	1.022	1.472	4.438	0.102
2007	1.715	4.989	1.109	1.402	4.567	0.109
2008	1.766	4.375	1.132	1.408	5.238	0.113
2009	1.736	5.331	1.074	1.689	4.120	0.114
2010	1.680	3.726	1.189	1.483	4.749	0.119
2011	1.645	3.432	1.285	1.366	4.642	0.119
2012	1.354	2.823	1.157	1.105	3.221	0.092
2013	1.532	3.098	1.326	1.244	3.845	0.088
2014	1.491	2.701	1.286	1.206	3.891	0.042
2015	1.457	2.878	1.192	1.146	4.182	0.007
2016	1.588	4.623	1.144	1.307	4.241	0.009

Source: Authors' calculation

competitiveness by the global crisis. There is a severe decline of competitiveness in this subgroup in 2009 and recovery is observed after 2014. The RCA index of “motor vehicles for the transport of goods” displays a stable period from 1989 to 2000 and a rapid increase after 2000. The RCA index of this subgroup has become higher than “1” since 2001. The competitiveness of this subgroup is also affected by the global crisis but not as much as “road motor vehicles” subgroup. In general manner, it can be said that these two subgroups, namely “road motor vehicles” and “motor vehicles for the transport of goods,” are the most competitive ones analyzed in motor vehicles sector.

RCA index of “*motor vehicles for the transport of persons*” subgroup has also increase during the period however its increase displays a slower trend. This subgroup has had comparative advantage since 2004 and competitiveness of it has also been affected by the crisis. When it comes to “*parts and accessories of the motor vehicles*” subgroup, we can observe that this subgroup also has increasing competitiveness. However, the index value of this subgroup has become higher than “1” since 2006. It should also be emphasized that it is the only subgroup of which competitiveness has not been affected by the global crisis. Finally, when we look at the “*motorcycles and cycles fitted with an auxiliary motor*” subgroup, we observe that Turkey does not have comparative advantage in terms of this subgroup. The index value of this subgroup is lower than “1” during the period. Protection and strengthening of competitive power are so vital for Turkey when the dependency of the automotive sector on international investment is taken into consideration. Currently, Eastern Europe countries such as Slovakia, Slovenia, Romania, Poland, and the Czech Republic are the competitors of Turkey (Aşarkaya 2017). It is also thought that Iran, China, and India are potential competitors for Turkey (KPMG 2018). Thus, it is so prominent for Turkey to sustain competitiveness. In the following part of the study, we compare the RCA index values of Turkey with these countries in terms of all subgroups presented above. However, the results do not contain Iran since the data for this country is not available regularly. Besides, the period of comparison starts from the year 1995 since some of the countries do not have data to calculate the previous years. Comparison of RCA index of Turkey with these countries for “road vehicles” main group is presented in Figs. 1 and 2.

Slovakia has become a competitive country in road vehicles’ main group since 1996 and it has outdistanced the Czech Republic and Slovenia since 1998. Slovakia still maintains leading competitiveness among these countries. Secondly, important competitive country in the graph is the Czech Republic and it is followed by

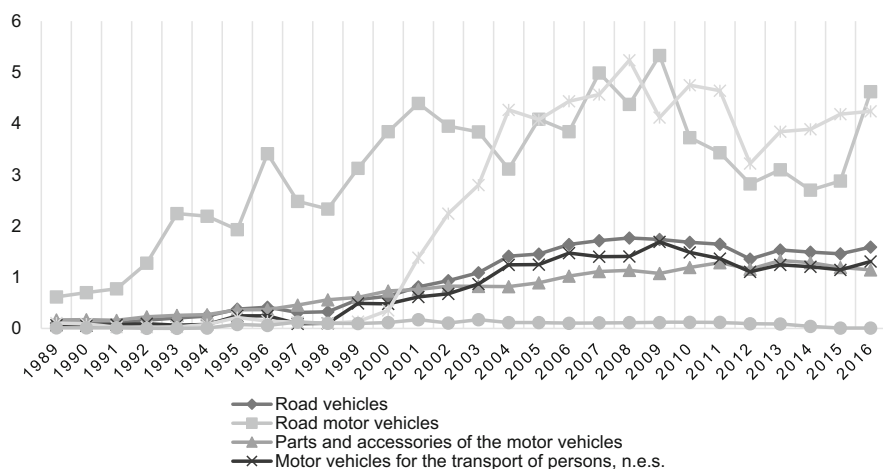


Fig. 1 RCA indices of Turkey (1989–2016) (Source: Authors’ calculation)

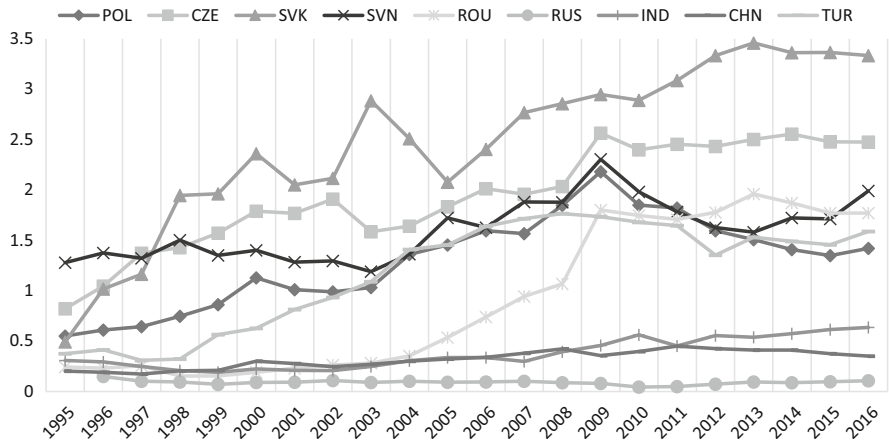


Fig. 2 RCA indices for “road vehicles” (Source: Authors’ calculation)

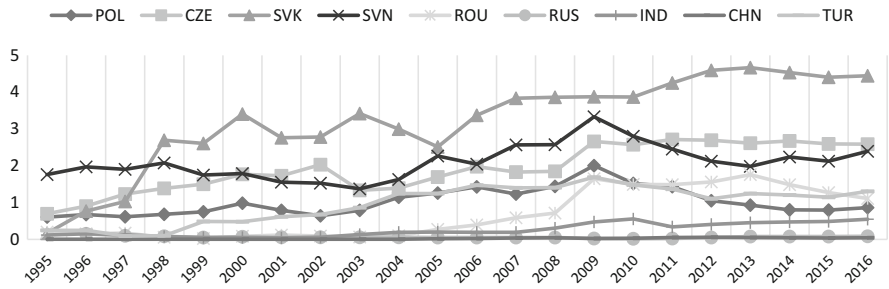


Fig. 3 RCA indices for “motor vehicles for the transport of persons” (Source: Authors’ calculation)

Slovenia till 2011. Romania that becomes a competitive country in 2008 in terms of the RCA index takes its place in 2011. When we compare Turkey’s RCA index with mentioned countries over the period, we observe that Turkey’s comparative advantage is below the level of these countries except Romania. RCA indices of India, China, and Russia still do not exceed the critical value, 1 (Fig. 3).

When it comes to “motor vehicles for the transport of persons” group, Slovakia, the Czech Republic, and Slovenia are the countries that exceed the critical index value for comparative advantages, 1, at the end of the 1990s. Comparative advantage of Turkey exceeds the critical value in 2004 and this index value displays a decrease with the global crisis in 2009. Turkey’s index values over the period display almost the same trend with the index values of Poland. India, China, and Russia have low index values for this group of products during the period (Fig. 4).

When we compare the RCA index of Turkey with other countries in terms of “motor vehicles for the transport of goods” group of good, we can observe that Turkey becomes comparatively advantageous country by landslide. Poland is the second competitive country following Turkey (Fig. 5).

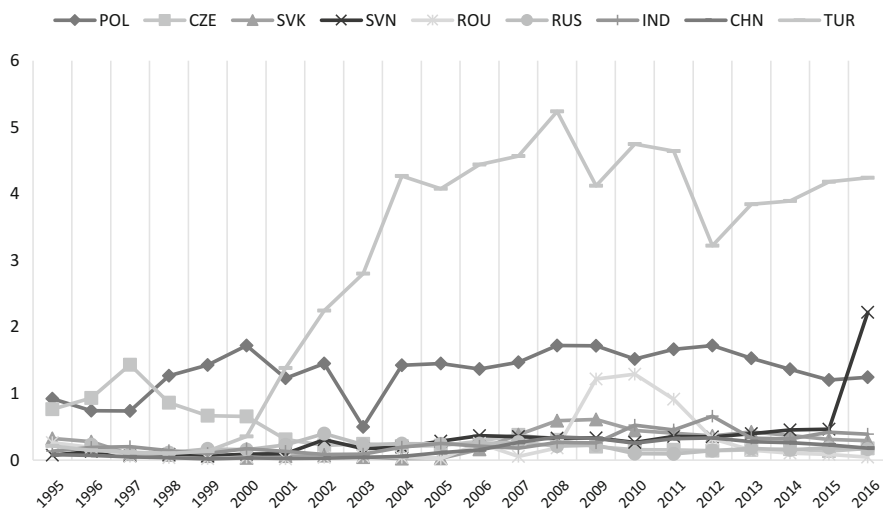


Fig. 4 RCA indices for “motor vehicles for the transport of goods” (Source: Authors’ calculation)

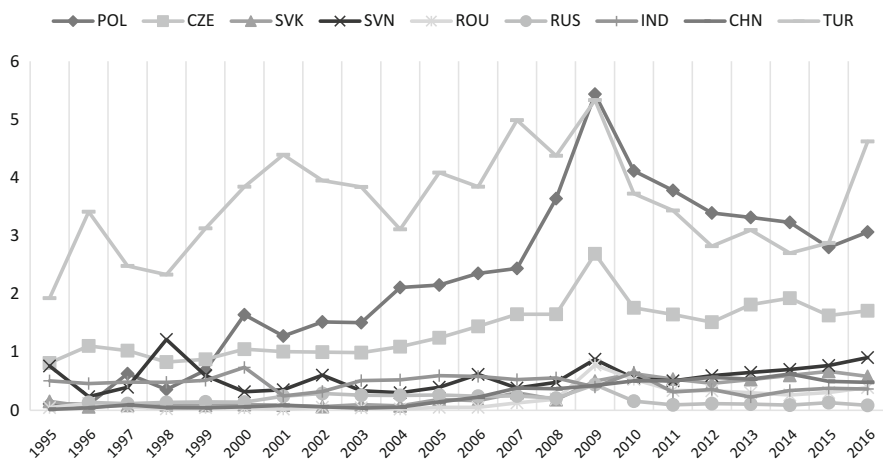


Fig. 5 RCA indices for “road motor vehicles” (Source: Authors’ calculation)

When it comes to “road motor vehicles” group of good that covers the motor vehicles for the transport of ten or more people (including the driver) and the road tractors for semitrailers, Turkey is the most advantageous country among these countries. Poland becomes the second advantageous country in 2000 and reaches Turkey in 2009. However, both countries have a decline for this group of good after the global crisis.

When we look at the index values of these countries in terms of “part and accessories of the motor vehicles,” the most competitive country in this group is the Czech Republic and Slovakia follows it. However, the trend of Slovakia’s index

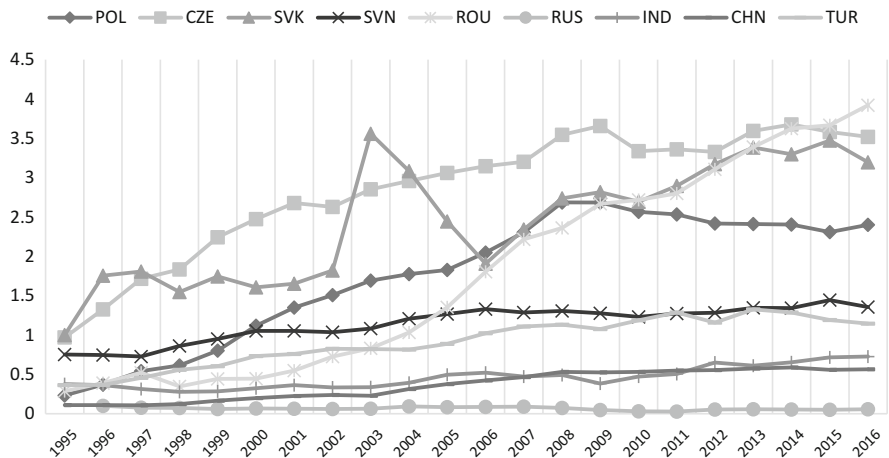


Fig. 6 RCA indices for “parts and accessories of the motor vehicles” (Source: Authors’ calculation)

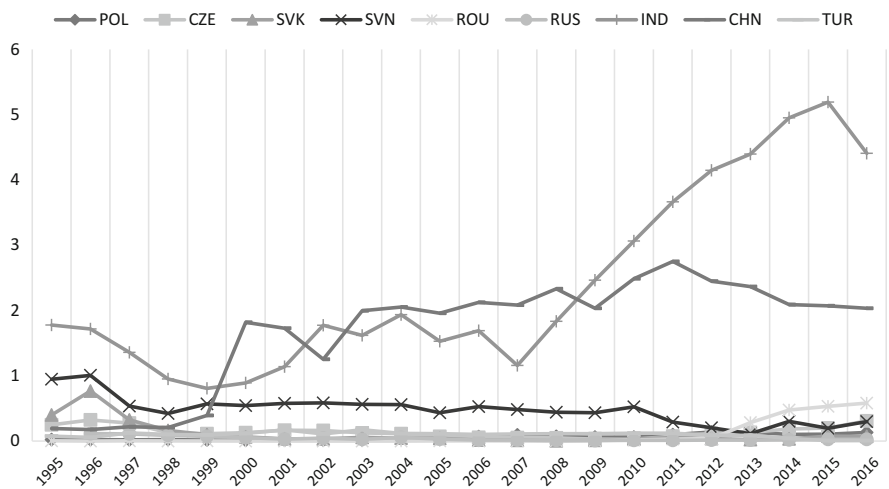


Fig. 7 RCA indices for “motor cycles and cycles fitted with an auxiliary motor” (Source: Authors’ calculation)

values does not display a steady increase as in the Czech Republic. The RCA index of Poland displays a stable increase till 2008 and decrease after. The most remarkable move in Fig. 6 belongs to Romania. Its RCA index values exceed “1” in 2004 and Romania gets ahead of the Czech Republic in 2015 (Fig. 7).

Finally, when we observe the RCA indices for “motor cycles and cycles fitted with an auxiliary motor” group of good, it is seen that India and China are the most advantageous countries. Index values of all of the other countries are lower than “1” meaning that their comparative advantages are not “revealed” for motor cycles.

5 Conclusion

Automotive sector is one of the locomotive sectors for industrial countries and it provides sustainable developments in the economic indicators. So automotive industry is one of the leading sectors in Turkey with high added value created. Especially in the recent period, Turkey has remarkable achievement in automotive sector against its competitors. The automotive export of Turkey is increasing in the period from 1989 to 2016. Europe is the most important export market and the importance of Turkish motor vehicle production is increasing day by day. Thus, Turkey is the 14th country in ranking for the motor vehicle production in the world.

The automotive sector competitiveness depends not only on the exporting amount but it also depends on the international investment in the automotive sector. The investments in the automotive industry of the European brands are moving to Eastern Europe countries such as Slovenia, Slovakia, Romania, Poland, and the Czech Republic. In addition, Iran, China, and India are thought to be potential competitors for Turkey. In this context, measuring the RCA of Turkey in motor vehicle production might be important for predicting the future situation in this sector. RCA indices of Turkey have increased since 2003, so Turkey has a comparative advantage in motor vehicle. Because the automotive sector is the most affected one in terms of competitiveness by the global crisis, the RCA index values of Turkish motor vehicle production fluctuate from 1989 to 2016.

In order to calculate the impact of the recent situations of the Eastern Europe countries in the automotive industry by using RCA indices, Slovakia has become the most competitive country and the other countries' production in this group has increasing, especially the Czech Republic. Although Iran's production has been increasing in this sector, when taking into consideration the RCA index values of India, China, and Russia, they do not have the comparative advantage in the motor vehicle. But the data of Iran's motor vehicle production is not existing and the RCA index of Iran could not be measured. In conclusion, there are new competitors in this sector and it is expected that the competitiveness of Iran and the Eastern European countries will be determinant in the medium- and long-term performance of the Turkish automotive industry.

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Intra-industry Trade Development and Adjustment Cost: Testing Smooth Adjustment Hypothesis for the Estonian Labor Market



Grigori Fainstein

Abstract In this chapter we analyze the trade expansion impact on labor market adjustment cost. The main aim of the investigation was to test the smooth adjustment hypothesis (Intra-industry trade expansion leads to significantly smaller labor adjustment costs). The empirical equation analyses the impact of intra-industry trade development on the Estonian sectoral employment change as an empirical proxy of labor market adjustment cost. For this purpose we used panel data for trade, employment, and set of control variables for 25 production sectors and years 2005–2015. In the analysis we apply a dynamic GMM-SYS model. The results obtained did not support the given hypothesis for Estonia in years under consideration. We also found a negative relation between sectorial change in labor productivity and employment. According to our results increasing competition due to trade expansion was not an essential factor of labor adjustment for Estonia.

Keywords Intra-industry trade · Smooth Adjustment Hypothesis · Labor market · Estonia

1 Introduction

In recent decades, the structure of foreign trade has changed significantly due to the processes of globalization. In addition to a change of the commodity and regional structure of trade flows, of great importance in globalization processes are technological cooperation, the activities of transnational corporations, and the growing role of economies of scale. All this leads to an increase in the share and value of intra-industry trade (IIT, simultaneous exports and imports within the production sector).

Change in trade patterns induces reallocation of production factors within and between economic sectors which leads to an adjustment cost. In a broad sense,

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adjustment costs are defined as the cost of adjustment of resources between economic sectors because of changes occurring in the economy (Azhar and Elliott 2003). In the context of trade expansion or contraction, this cost is associated with the reallocation of production resources. Changes in trade patterns in their turn depend on different factors, such as trade liberalization, changes in production structure, in domestic and foreign demand. Most empirical papers devoted to adjustment costs analyze the labor adjustment because these costs are the highest. Labor adjustment costs include unemployment, decreasing wage level, cost of retraining, etc.

The relation between the dynamics of trade patterns and adjustment costs is formulated by the smooth adjustment hypothesis, SAH (Brulhart and Elliot 1998; Brulhart 2000; Greenaway et al. 1999; Lovely and Nelson 2002, etc.). According to this approach, mobility of labor and capital is higher within economic sectors than between them because of similarity of labor skills and technologies within industries. Often, firms in the same industry are spatially concentrated, which also increases mobility.

Because changes in trade patterns within industries are associated with intra-industry trade, changes in inter-industry trade lead to the reallocation of production factors between industries, while IIT growth leads to smaller adjustment costs.

This chapter analyses the impact of intra-industry trade development on the Estonian sectoral employment change as an empirical proxy of labor market adjustment cost. For this purpose, we used panel data for trade, employment, and set of control variables for 25 production sectors and years 2005–2015. We contribute to the literature on the topic by testing SAH in the Baltic States what was not done before. The results obtained do not support smooth adjustment hypothesis for Estonia in the considered period. The results for other transition countries show evidences as for as against SAH depending on country and period under consideration.

The rest of this chapter is organized as follows. Section 2 presents theoretical framework and literature review of labor market adjustment cost analysis. Section 3 analyses data and model specification. Section 4 presents empirical results. The final section draws conclusions.

2 Literature Review

The main theoretical framework for discussing of adjustment cost is the factor specific model (Jones 1971). This model considers small open economy with export oriented and import competing production sectors with perfect competition and world market prices. The labor can move freely between sectors. In the case of trade liberalization export demand and import supply grow which triggers growth of export sectors, contraction of import competing sectors, and movement of labor toward the first sectors. In the long run economy returns to the equilibrium with the positive effect from deeper specialization. In the short run this labor transition is not

costless. The main sources of adjustment cost are labor heterogeneity, wage rigidity, and market imperfection. The most obvious adjustment cost is unemployment. We can consider also output and income lost.

Trade development relates to specialization. Growth of intra-industry trade stimulates labor movement within production sectors in contrast to inter-sectoral movement in the case of traditional trade increase. According to model movement within sectors is less costly because of similar technology (factors proportions) and requirement to labor skills (Greenaway et al. 1999; Brulhart et al. 2006; Brulhart 1999; Elliott and Lindley 2006).

Empirical investigation of labor adjustment cost requires adequate empirical proxy. Different indicators are considered in literature. The most common approach is the absolute value of employment change between considered time periods in each production sector (see for example, Cabral and Silva 2006; Brulhart and Hine 1998; Chemsripong 2014). This proxy is based on assumption that adjustment cost of labor movement between sectors is proportional to the size of net payroll changes, and that this proportion is similar across industries and over time (Brulhart and Thorpe 2000).

Another approach introduces the employment lag as a dependent variable. As mentioned in Faustino and Leitão (2009), we do not know the sources of the dynamics process in the employment equation. We only know that the level of employment changes where the adjustment to equilibrium takes place. However different sign (According to theoretical prediction, it should be negative for import competing sectors and positive for export oriented) could eliminate the investigated dynamic because the most dependent variables are relative indicators and have a positive sign. This is the reason for choosing the first approach in our empirical analysis.

To test the smooth adjustment hypothesis intra-industry trade should be measured. In literature different indicators was proposed but the most popular is the index proposed by Grubel and Lloyd (1975) according to the following formula

$$GL_i = 1 - \frac{|X_i - M_i|}{(X_i + M_i)} \quad (1)$$

where

M_i denotes countries' imports of production sector i

X_i denotes countries' exports of production sector i

The GL index varies between 0 and 1. "1" means that trade is completely intra-industry while "0" indicates inter-industry (unmatched) trade.

Since adjustment cost is a dynamic process, the GL index is not the best measure because it is a static indicator. Even comparative static approach (compare the level of indicator with previous period) does not reveal the dynamic of trade patterns.

To overcome this problem, Brulhard (1994) proposed a measure of marginal intra-industry trade (MIIT):

$$MIIT_i = 1 - \frac{|\Delta_t X_i - \Delta_t M_i|}{|\Delta_t X_i| + |\Delta_t M_i|} \quad (2)$$

where $\Delta_t X_i = X_{it} - X_{t-1,i}$
 $\Delta_t M_i = M_{it} - M_{t-1,i}$

This index is a transformation of GL index and reveals the structure of change in trade flows. It is also ranging between 0 and 1. “0” means that marginal trade is completely inter-industry and “1” displays that trade expansion is 100 per cent of intra-industry type.

3 Data and Model Specification

All data were obtained from the Estonian Statistical Office database. The sample covers 25 industrial sectors (according to EMTAK classification) for the period 2005–2015 years. The panel is balanced with 250 observations altogether (1 year is lost because of the time lag). Dynamic character of labor market adjustment and effects of independent variables requires using of the dynamic model. In this analysis we apply a dynamic panel GMM model. The GMM system (GMM-SYS) estimator solves the problems of serial correlation, heteroscedasticity, and endogeneity among explanatory variables which deviate the estimates in static panel data models. In this approach a system of equations in both first differences (with lagged levels as instruments) and levels (with lagged first differences as instruments) are combined (Arellano and Bond 1991).

To analyze the relation between intra-industry trade and adjustment cost we estimate the following equation

$$\begin{aligned} DEMPL_{it} = & \beta_0 + \beta_1 DEMPL_{it-1} + \beta_2 MIIT_{it} + \beta_3 DPROD_{it} + \beta_4 TRADE_{it} \\ & + \eta + \delta_t + \varepsilon_{it} \end{aligned} \quad (3)$$

where

$DEMPL_{it}$ is the absolute change in employment in i production sector in year t

$MIIT$ is the Brulhard index of marginal intra-industry trade (2)

$DPROD$ is the absolute change in labor productivity (production per worker)

$TRADE$ is an indicator of trade openness calculated as a share of import and export in production of each industrial sector.

η is the unobserved time-invariant individual specific effects.

δ_t is a common deterministic trend

ε_{it} is the random error term assumed to be normal, and identically distributed with $E(\varepsilon_{it}) = 0$;

$\text{Var}(\varepsilon_{it}) = \sigma^2 > 0$.

Our theoretical assumption about the expected sign of dependent variables is as follows:

Table 1 Descriptive statistics of variables

	Mean	Median	S.D.	Min	Max
DEMP	299.9	143	448.4	0.00	4254
MIIT	0.490	0.534	0.359	0.00	0.999
DPROD	0.0810	0.0722	0.0472	0.0129	0.299
TRADE	1.20	0.964	0.835	0.139	7.71

Source: Own calculations

Table 2 GMM-SYS panel data estimates

Dependent variables	Coefficient
DEMP(-1)	0.19*** (0.0003)
MIIT	164** (0.0132)
DPROD	-4617** (0.0113)
TRADE	-73.6* (0.0966)
Constant	263*** (0.0005)
Arellano-Bond test for Ar(2)	0.898 (0.369)
Wald test	46.5*** (0.000)
Observations	225

Note: *p*-values are in parenthesis

Source: Own calculations

***, **, * indicates statistical significance at 1%, 5%, and 10%, respectively

H1: According to SAH intra-industry trade expansion decreases the level of adjustment cost ($\beta_2 < 0$).

H2: The relationship between change in sectoral productivity and employment change is ambiguous. If the industry is expanding, the relation is positive. If an increase in labor productivity results in labor substitution, the relation could be negative.

H3: Increasing trade openness increases competition which in turn increases adjustment pressure. ($\beta_4 > 0$).

H4: Lagged labor adjustment (change in employment) determines the current adjustment ($\beta_1 > 0$).

4 Empirical Results

Table 1 reports descriptive statistic of considered variables. The diversity of data should be taken into account in estimated methodology.

Table 2 reports the estimation result. According to theoretical prediction, the lagged dependent variable is positive and statistically significant. The marginal intra-industry trade positively correlated with employment change. The result is statistically significant and did not confirm the SAH hypothesis.

Table 3 Fixed effect panel data estimates

Dependent variables	Coefficient
Constant	64.75*** (0.0016)
MIIT	58.23** (0.0175)
TRADE	45.67 (0.8353)
DPROD	-2985* (0.08)
<i>R</i> -square	0.32
<i>F</i> -statistics	2.61* (0.07)
Welch <i>F</i> test	3.43*** (0.00)
Observations	250

Note: *p*-values are in parenthesis

Source: Own calculations

***, **, * indicates statistical significance at 1, 5, and 10%, respectively

Change in productivity negatively correlated with employment change. The result is also statistically significant with 5% level. This result shows that labor substitution effect dominates. The trade openness negatively correlated with employment change with 10% level of significance. This is the evidence that increasing competition determined by trade expansion is not an essential factor of labor adjustment which is also evidenced against SAH.

According to Arellano-Bond test estimates are consistent. Arellano-Bond is the test for Ar(2) for second-order correlation in the first-different residuals. The null hypothesis is no serial correlation. As can be seen no problems with the validity of Ar(2) exists. The Wald test evaluates the significance of all coefficients together. The null hypothesis is that all coefficients are not different from zero.

We test our model for robustness by calculating static fixed effect panel data estimates, because in the years included in observation the production sectors remain the same (Cross section component of data does not change). The results reported in Table 3. As can be seen the results are similar to the results of dynamic model. The sign of coefficients remains the same (excluding trade openness which is not statistically significant in this estimation). The value of the coefficients is also not differing significantly.

5 Conclusion

In this research we analyze the trade expansion (and first of all, its intra-industry component) impact on labor market adjustment cost, controlling some other important variables in the Estonian production sectors in 2005–2015. The main aim of this investigation was to test the smooth adjustment hypothesis for the Estonian economy. The results obtained did not support SAH for Estonia in years under consideration. The relation between marginal intra-industry trade and employment change is positive and statistically significant in both specifications. One can assume,

however, that SAH was valid for Estonia in the previous decades, during trade liberalization (because of accession into the EU) and essential structural changes. So, the further investigation requires extending the analyzing period.

We also found a negative relation between sectorial change in labor productivity and employment. This is the evidence that labor substitution effect prevailed in the period under consideration in the Estonian industry. Employment change as a lagged variable has a positive and statistically significant influence. This requires farther investigation of how the estimation result is sensitive to the choice of length of time in calculating MIIT index and other variables. The relations in the medium term (for example, 3 or 5 years change) could be different. The influence of trade openness on employment change is negative despite theoretical prediction. This is the evidence that increasing competition determined by trade expansion is not an essential factor of labor adjustment for Estonia in years under consideration.

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Underemployment Among Educated Poles



Anna Bebel, Maria Piotrowska, and Marek Kośny

Abstract This chapter presents the issue of underemployment affecting highly educated Poles. It analyzes the extent of underemployment in the Polish labor market and its effect on such factors as income stability, job satisfaction, or life satisfaction. The gender aspect of underemployment (whether women are more likely to be underemployed than men, or vice versa) is also analyzed.

In the paper, data from both primary and secondary sources were used, and statistical methods were applied, i.e., descriptive statistics and OLS regression models. In contrast to unemployment among persons with higher education, which is currently negligible in Poland (with the exception of a specific group of graduates entering the labor market), underemployment constitutes a significant issue. More than 15% of educated Poles would like to work more hours per week and more than 40% work below their level of qualification. Underemployment brings negative consequences for employees, such as lower income, lower financial stability of the family, or lower satisfaction from work and life.

Keywords Higher education · Overeducation · Underemployment · Labor market

1 Introduction

More and more Poles have higher education. Universities are becoming the next stage of education for the majority of young people. Does the Polish labor market have adequate jobs for this many educated and qualified employees? What is the situation in the Polish labor market? Do Poles work in accordance with acquired education? Do work hours correspond to the expectations of employees? So far, the basis for analyzing the labor market has been the issue of unemployment. As a problem of the labor market, however, insufficient quantity or quality of work can

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also be considered, apart from the lack of work. Also, people who work below the expected number of work hours, or below the level of their education and qualifications, do not use their resources fully, which causes an inefficiency in this market.

The aim of this chapter is to analyze the situation of highly educated people on the Polish labor market within the context of the underemployment phenomenon. According to the International Labor Organization (ILO) approach, “visible” and “invisible” underemployment can be distinguished (Hussmanns et al. 1990). “Visible” underemployment is defined as “involuntary part-time employment” (Bednarzik 1975) and means a situation in which a person is working fewer hours than he/she would like to (time-related underemployment), while “invisible” underemployment occurs when a person is working below his or her level of education or qualifications (overeducation) (McGuinness 2006).

There is still no single coherent theory of overeducation. Some researchers have tried to explain overeducation in the context of semiformal economic models (Freeman 1976; McMillen et al. 1999). Among the various theories attempting to explain the phenomenon, the most important are as follows: the theories of the labor market (in particular, the Human Capital Theory), the Assignment Models, and the Job Competition Model (Heckman et al. 2003; Duncan and Hoffman 1981; Hartog and Oosterbeek 1988). Researchers of underemployment also analyze the relationship between the extent of overeducation and gender or spatial factors (Frank 1978; McGoldrick and Robst 1996; Buchel and van Ham 2002).

Time-related underemployment is, in turn, explained based on the labor supply models within the context of labor supply flexibility (e.g., Altonji and Paxson 1992; Ham 1982; Kahn and Lang 1991) and within the context of the asymmetric information in labor contracts (Azariadis 1983; Cooper 1985; Green and Kahn 1983; Meyer 1987). Researchers are also interested in characterizing the causes and consequences of and the trends in underemployment (e.g., Dooley et al. 2000; Feldman 1996; Friedland and Price 2003; Ruiz-Quintanilla and Claes 1996; Sorrentino 1995; Wilkins 2004). There are not many studies in Poland dealing with this subject.

This chapter presents the extent of underemployment in the Polish labor market and the potential effects that it can cause for employees. Few models (OLS regression models) describing the association between time-related underemployment and selected outcomes potentially impacted by underemployment status will also be estimated.

In this chapter, data from both primary and secondary sources are used: the Labor Force Survey (LFS) and the results of empirical research, carried out using the CAPI (Computer-Assisted Personal Interviewing) method, for a nationwide sample of Poles with higher education (ages 25–45). During the period November–December 2016, 902 interviews were carried out among 542 women and 360 men. In determining the results, statistical methods were applied, which were primarily descriptive statistics.

2 The Extent of Inadequate Employment in Poland: Survey Results

People with higher education easily find employment in the Polish labor market. According to the LFS report, only 3% of such people remained unemployed, with a general unemployment rate of 5.5% in the fourth quarter of 2016. Moreover, people with higher education are also characterized by a higher activity rate (at 80.2%, with an average of 56.3%) and a higher employment rate (at 77.9%, with the average at 53.2%) in the fourth quarter of 2016 (LFS 2017). Out of those surveyed, only 7% were without work, of which only 20% were unemployed.

Although there is no unemployment problem among educated people, this does not mean there is an effective use of this human capital resource. In fact, 15% of working people work less than the desired number of work hours. Generally, this issue is not dependent upon the gender of the employee, yet it differs significantly in the case of part-time working people, the ones who mainly face this problem. Over 36% of women and almost 42% of part-time workers would like to work more, so it can be assumed that a smaller amount of working time was not a conscious decision by the employee but a necessity.

The study did not analyze the possibility of working additional hours; therefore the analysis is based only on estimating the scale of underemployment based on respondents' declarations. In addition, of the two methods used to measure time-related underemployment, headcount measurements (number of persons underemployed), and volume measurements (number of hours of underemployment), further analyses were based solely on the first approach.

2.1 *Invisible Underemployment (Overeducation)*

Overeducation occurs when a given employee works below his or her educational level, and overskilling occurs when an employee works below his or her qualifications. According to Sattinger (1993), people who are overeducated work below their qualifications and, therefore, earn less, because they work in jobs that limit their productivity, and so their skills are wasted. It goes without saying that skill level is, to an extent, assigned to a position regardless of the characteristics of the person who occupies that position.

The theory of skill heterogeneity (Green and McIntosh 2007) is based on the basic human capital theory, according to which it is the individualized level of human capital that assures a certain level of productivity, regardless of the position and work for which the person is employed. This is the reason why people with higher qualifications take up positions requiring a higher skill level. Imperfections in the process of matching employees to workplaces leads to under- and overeducation.

It can be assumed that certain circumstances justify taking on a job below your educational level if you can expect to improve your professional status in the future.

Table 1 Overeducation in Poland according to the field of study and gender (%)

Field of study	Overeducation (formal)		Overeducation (actual)	
	Women	Men	Women	Men
Humanities (excluding law)	34.8 (0.04)	36.7 (0.03)	38.0 (0.04)	33.3 (0.04)
Law	15.4 (0.10)	25.0 (0.11)	15.4 (0.09)	25.0 (0.10)
Medicine	25.0 (0.08)	50.0 (0.07)	25.0 (0.08)	50.0 (0.08)
Social sciences (including pedagogical studies, but excluding economics)	27.9 (0.04)	46.7 (0.04)	30.2 (0.04)	43.3 (0.04)
Economics	34.3 (0.03)	30.1 (0.02)	38.5 (0.04)	28.8 (0.03)
Arts	72.7 (0.13)	50.0 (0.11)	81.8 (0.13)	50.0 (0.12)
Technical	55.0 (0.04)	46.2 (0.03)	55.0 (0.04)	48.1 (0.04)
Natural and agricultural sciences	3.3 (0.08)	57.1 (0.09)	38.1 (0.08)	57.1 (0.09)
Other (e.g., physical education)	69.2 (0.10)	62.5 (0.12)	69.2 (0.11)	62.5 (0.11)
Total	36.8 (0.04)	43.0 (0.04)	40.3 (0.04)	43.3 (0.04)

Notes: Standard errors in parentheses

Overeducation (formal): Less than higher education is required at a given post (based on the respondents' answers)

Overeducation (actual): Actual level of education required at a given post, less than higher education (based on the respondents' subjective assessment)

Source: Own calculations

However, it has been proven that only a small percentage of employees who are currently overeducated will not be overeducated in the future (Sicherman 1991; Bauer 2002; Rubb 2003). These results seem to confirm the suggestion that overeducation is associated with a lack of appropriate skills to work in a different (more demanding) position and, therefore, cannot be considered as a temporary issue related to the acquisition of professional experience by young graduates. However, it may also be the case that someone deliberately chooses a job below their level of education because it guarantees higher salaries than the work in their profession. In this case, it would be a mistake to consider the phenomenon overeducation due to weakness in the labor market.

Although according to the international comparisons conducted, the scale of overeducation in Poland does not stand out among EU or OECD countries (see OECD 2015), the problem of overeducation among people with higher education is, however, significant in Poland. In 2016, about 40% of educated employees worked below their level of education. Moreover, this situation may deteriorate with an increasing level of education among Poles, the increasingly widespread further education of graduates of secondary schools and the increasing number of graduates seeking employment. The risk of overeducation is largely related to the completed field of study and also (depending on the profession) to the gender of a university graduate. Table 1 presents the extent of overeducation broken down by field of study and gender.

The least overeducated group of employees, among both men and women, was the group with a degree in Law, while the most overeducated were those with an Artistic (for women) or Other degree (e.g., Physical Education) in both genders, and

Natural and Agricultural Sciences (for men). A Technical degree did not give the employees in Poland (for both men and women) a greater chance to utilize their educational background in their work. About half of employees with this degree were working below the level of their qualifications, definitely more so among women.

Interestingly, the percentage among Medical graduates was twice as high among women as men (every second man with this degree worked below his qualifications). The situation was similar in the case of people with a degree in Social Sciences, where almost half of men, and a much lower percentage of women, did not use their education at work. However, the situation was different among graduates of economic universities. In this case, a smaller proportion of men than women remained overeducated.

Overall, the problem of overeducation affects men more than women. A probable explanation for this phenomenon may be further analyzed, specifically the potential effects of remaining overeducated. However, the difference between the genders is definitely greater when evaluating formal (6.2 percentage points) rather than actual (3 percentage points) overeducation.

3 Outcomes Associated with Visible and Invisible Underemployment

3.1 Descriptive Statistics

Work incompatible with the employee's expectations (e.g., regarding hours worked, skills used) does not give full satisfaction and can be a source of various negative effects (both related to income earned, as well as a sense of stability of income or satisfaction with life). Selected potential effects related to both visible and invisible underemployment were presented in the form of the descriptive statistics of selected variables (which can be considered as reflecting the outcomes experienced by the respondents). Table 2 presents the descriptive comparisons between underemployed workers and fully employed workers and non-overeducated workers with overeducated workers.

In the presented division, the categories fully- and underemployed, as well as non- and overeducated do not constitute four separate groups but rather divide employees in terms of two different criteria (working time and working in their profession). A comparison in one table, however, shows how these isolation criteria affect the obtained results and within which the visible or invisible underemployment phenomenon should be considered significant as having a greater impact on the employees' life situation. The highest rates (in the case of most categories) were obtained among the non-overeducated followed by the fully employed. The lowest rates were among underemployed and then overeducated (except for Financial Situation, Wealth and Personal and Family income in the case of women).

Table 2 Outcomes of time-related underemployment and overeducation for highly educated employees ages 25–45

	Fully employed		Underemployed		Non-overeducated		Overeducated	
	Females	Males	Females	Males	Females	Males	Females	Males
Life satisfaction	4.03 (0.03)	4.00 (0.04)	3.63 (0.09)	3.61 (0.12)	4.07 (0.04)	4.01 (0.05)	3.80 (0.05)	3.86 (0.06)
Job satisfaction	3.81 (0.04)	3.96 (0.05)	3.19 (0.1)	3.25 (0.13)	3.94 (0.05)	4.02 (0.06)	3.34 (0.07)	3.65 (0.07)
Financial situation	3.55 (0.04)	3.57 (0.05)	3.4 (0.1)	3.51 (0.12)	3.65 (0.05)	3.75 (0.05)	3.32 (0.07)	3.32 (0.08)
Wealth	3.16 (0.04)	3.14 (0.04)	2.91 (0.11)	3.02 (0.14)	3.25 (0.04)	3.26 (0.05)	2.90 (0.07)	2.95 (0.06)
Personal income	2819 (69)	3422 (126)	3143 (210)	3195 (254)	2970 (80)	3322 (111)	2674 (117)	3482 (227)
Family income	5810 (200)	5948 (256)	5519 (560)	5325 (725)	6160 (234)	6023 (284)	5066 (312)	5539 (433)
Income stability	3.88 (0.04)	3.87 (0.05)	3.4 (0.11)	3.47 (0.11)	3.98 (0.04)	3.95 (0.05)	3.51 (0.06)	3.61 (0.07)
Expenditures (on housing, education)	1387 (45)	1305 (52)	1566 (116)	1460 (119)	1428 (52)	1399 (63)	1388 (71)	1225 (72)
Applying for a new job	11.2 (0.11)	9.2 (0.10)	44 (0.12)	35.3 (0.13)	9.6 (0.10)	10.2 (0.11)	27.5 (0.11)	16.9 (0.12)
Last job change	3.73 (0.22)	3.94 (0.23)	4.23 (0.32)	3.91 (0.4)	4.07 (0.26)	3.93 (0.28)	3.35 (0.28)	3.9 (0.28)
Period of unemployment	4.54 (0.27)	3.74 (0.28)	5.25 (0.57)	4.64 (0.75)	3.71 (0.26)	3.33 (0.31)	6.26 (0.46)	4.59 (0.45)
First permanent job	7.9 (0.53)	6.96 (0.53)	9.81 (1.32)	7.04 (0.84)	7.02 (0.54)	5.35 (0.45)	10.2 (0.95)	9.11 (0.89)

Notes: Standard errors are indicated in parentheses

Life satisfaction: Average level of satisfaction with life on a scale from 1 to 5, where the higher value means a higher level of satisfaction

Job satisfaction: Average level of satisfaction with work on a scale from 1 to 5, where the higher value means a higher level of satisfaction

Financial situation: Average level of satisfaction with financial situation on a scale from 1 to 5, where the higher value means a higher level of satisfaction

Wealth: Average rating of wealth compared to others on a scale from 1 to 5, where the higher value means a higher level of wealth

Personal income: Average net monthly income for the individual, in PLN

Family income: Average net monthly income for the family, in PLN

Income stability: The average measurement of income stability on a scale from 1 to 5, where the higher value means a higher level of stability

Expenditures: Monthly average household expenditures on housing and education, in PLN

Applying for a new job: percentage of applicants who applied for a new job within the last 6 months

Last job change: Average period of time since the last job change, in years

Period of unemployment: Longest average period of unemployment, in months

First permanent job: Length of time spent searching for the first permanent job after graduation, in months

Source: Own calculations

Interestingly, the average income of overeducated men was higher than for non-overeducated men. However, this was not the case for women. A likely explanation for this difference may result from the hypothesis that men who work below their level of education intentionally give up work in the profession for higher paid work but work for which, however, no higher education is required. Nevertheless, it should be taken into account that in the case of people who are overeducated, the level of satisfaction is lower, as the ratings for Work, Life, and Financial Situation indicates. The income levels in overeducated men's families are also lower than for non-overeducated men. Therefore, it seems likely that the choice to work below the level of education could be dictated by a family situation in which the man is the breadwinner, and therefore the work is treated primarily in terms of source of income, not as a place of personal or professional development, which contributes to lower job satisfaction ratings. By analyzing the history of the first job and the period of unemployment, one can conclude that overeducated people are those who have been looking for their first job after graduation longer than others, they have remained unemployed for a long time and they are looking for new employment more often than other employees. It is also interesting that the average income of underemployed women was higher than fully employed women and almost as high as for men. However, the average family income was lower than in the case of fully employed women. It was also characterized by much lower stability. Furthermore, average expenditures on housing and education were highest in this group.

3.2 Estimation of Model

A few models presenting the association between underemployment and outcomes potentially impacted by underemployment status were estimated, in order to broaden the conclusions from the analysis. Three outcomes were examined:

- Income stability at the time of the survey
- Life satisfaction at the time of the survey
- Job satisfaction at the time of the survey.

The explanatory variable (for underemployment) is a dummy variable—it indicates only whether the person is underemployed or not. It does not indicate the scale of underemployment (e.g., in hours per week). The main purpose of this chapter is to indicate potential outcomes of underemployment, that is, the “average” effect of underemployment on a backdrop of full employment. Personal income and family income could not be used as explanatory variables, as there was no data on the exact values of both income types (only data in the form of income ranges was available).

The authors realize that the dependencies presented below may work in both directions. Indicators recognized as potential effects of underemployment may affect underemployment. The following were used as control variables: age, number of dependent children, size of place of residence, and health and size of company. Coefficient estimates for the controls are reported in Appendix A.

Table 3 Outcomes associated with underemployment among highly educated employees

	Income stability	Life satisfaction	Job satisfaction
<i>Females</i>	−0.240*** (0.050)	−0.203*** (0.042)	−0.312*** (0.057)
Age	0.020*** (0.006)	0.001 (0.050)	0.016** (0.007)
Number of dependent children	0.101*** (0.038)	0.066** (0.032)	0.120** (0.047)
Size of place of residence	−0.006 (0.015)	−0.018 (0.013)	0.000 (0.018)
Health	0.353*** (0.037)	0.266*** (0.032)	0.390*** (0.046)
Size of company	0.138*** (0.038)	0.016 (0.033)	0.091** (0.045)
<i>Males</i>	−0.198*** (0.061)	−0.196*** (0.055)	−0.354*** (0.063)
Age	−0.003 (0.008)	−0.002 (0.007)	0.016* (0.008)
Number of dependent children	0.012 (0.049)	0.043 (0.044)	0.131** (0.052)
Size of place of residence	0.005 (0.019)	0.008 (0.017)	−0.016 (0.020)
Health	0.264*** (0.048)	0.298*** (0.042)	0.246*** (0.052)
Size of company	0.054 (0.044)	−0.018 (0.040)	0.001 (0.047)

Notes: Standard errors in parentheses. Estimates for models: OLS coefficient estimates

Source: Own calculations

* $p < 0.1$

** $p < 0.05$

*** $p < 0.01$

Each model was estimated using OLS regression, and the results are presented in Table 3. They can be interpreted as the percentage of change in the dependent variable in association with an increase of one unit in the explanatory variable.

Underemployment is associated with a significant decrease in job satisfaction for both males and females: 31% for females and 35% for males. Underemployment is also associated, although to a lesser extent, with a decrease in life satisfaction and income stability. In this case, these effects are stronger for women (20% and 24%, respectively) than for men (less than 20%).

All dependent variables for models are indexes of job satisfaction or income stability, where respondents were asked to rate level of income stability over the next year and overall satisfaction with life and work on a scale from 0 (very unstable/completely dissatisfied) to 5 (very stable/completely satisfied). OLS regression may not be appropriate for such dependent variables, mainly because the increase of the index by one unit may not be the same for different index values, and because the variable is limited from 1 to 5. For this reason both probit and OLS models were estimated. However, taking into account the similarity of results and the much simpler interpretation of results using the OLS models, it was decided to present only the results from OLS regression.

Health is strongly associated with all outcomes for both genders. In addition, in the case of women, other factors such as the number of children, age or size of the enterprise were related to the assessment of job and life satisfaction and income stability. In men, such strong relationships were not observed, except for the relationship between the number of children or age and job satisfaction.

4 Conclusion

Although employees with higher education do not have problems finding a job in Poland, this work is often not suited to the expectations and needs of employees. Fifteen percent of employees would like to work more than they do currently, and two out of five workers in a position that does not require higher education, i.e., below their qualifications. The problem of “underemployment,” which is broadly understood although it does not seem to be as significant a problem as unemployment, also brings negative consequences, in the form of, lower income and lower financial stability of the family, or less satisfaction from work and life, among others.

Although the problems of unemployment or underemployment are or should be significant policy issues, this chapter does not provide unambiguous answers about the effects, or even more so the reasons for underemployment. Therefore, it cannot be a source for further action by state authorities. However, the conducted analyses may indicate the direction of work to further examine the problems of underemployment, which are related to both insufficient work time and work below qualifications. An important task worth undertaking is an attempt to determine the background and causes of the underemployment phenomenon, as well as to identify the groups that are at risk of underemployment.

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Part III
Investment and Risk Management

A Factor Model for Country-Level Equity Returns



Adam Zaremba

Abstract We offer a new three-factor asset-pricing model for country equity returns. The model accommodates a broad set of country-level cross-sectional anomalies better than the popular CAPM, three-factor model, and four-factor model. Furthermore, it fully explains the performance of other models' factors, while the standard models are not able to explain the alphas of their factors. The new model relies on the country-level portfolios formed based on the EBITDA-to-EV ratio and on skewness-enhanced momentum. These factor portfolios provide reliable and robust sources of return, and their performance is consistent with the behavioral finance mispricing interpretation. This study is based on the accounting and price data from 78 country equity markets in 1995–2015.

Keywords International investments · Country-level anomalies · Factor models · Return predictability · Asset allocation

1 Introduction

Modern finance usually relies on stock-level factors in asset-pricing models. However, this approach might not fully reflect the standpoint of international investors, who now, more often than ever, utilize country-level passive investment vehicles, such as exchange-traded funds (ETFs), index funds, or equity index futures. Thus, in this chapter, we offer a country-level asset-pricing model that fits the current landscape of global investment opportunities better.

In the existing academic literature, there are three very common popular approaches to asset pricing with the use of country-level asset-pricing models. The first is to use a cross-country version of the standard Capital Asset-Pricing Model

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(Sharpe 1964), i.e., to account only for the global portfolio. The main disadvantage of this approach is that it does not consider any country-level cross-sectional return patterns related to, for example, size (Keppeler and Traub 1993; Asness et al. 1997; Keppeler and Encinosa 2011), value (Macedo 1995; Asness et al. 1997; Desrosiers et al. 2004, 2007; Kim 2012; Angelidis and Tessaromatis 2014; Li and Pritamani 2015), or momentum effects (Asness et al. 1997; Bhojraj and Swaminathan 2006; Balvers and Wu 2006). As a result, the next model, which is effectively a parallel of the stock-level three-factor Fama and French (1993) model, also accounts for cross-country value and size effects. This approach, used, for example, by Umutlu (2015), consists of Fama-French-style HML and SMB factors, which are formed from country equity indices. Finally, the third model, which effectively is a country-level parallel of Carhart's (1997) model, extends the three-factor model with momentum effects. This model, along with the three-factor model, was tested by Zaremba (2015a).

The Achilles' heel of the aforementioned multifactor models consists of their factors. In fact, none of them is supported by solid empirical data that proves that they are sources of long-term risk premiums. The size effect not only lacks a proper theoretical background, but it also has been insignificant for the last 20 years (Zaremba 2016a, b). Regarding the value effect, the existing evidence indeed provides convincing evidence that the fundamental ratios are related to future returns. However, among all of the popular valuation metrics, the link seems to be weakest precisely for book-to-market (B/M) ratio (Zaremba 2015a, 2016a, b), which is the most popular metric. Finally, the last factor is momentum, which is commonly measured as the cumulative returns over the past year with the most recent month skipped. In this case, the soft spot is that these effects are present almost exclusively in equal-weighted portfolios (Zaremba 2015a, 2016a, b). This observation undermines the reliability of momentum as a reliable long-term cross-country source of returns.

In this chapter, we offer a new country-level asset-pricing model, which aims to correct the aforementioned shortcomings. The model, denoted EMS_{EW} , is based on three-factor portfolios. The first factor is the simple return on the market portfolio, i.e., the capitalization-weighted portfolio of all of the country equity markets in the sample, analogous to standard CAPM, the three-factor or the four-factor model. The second factor is a zero-investment portfolio from a sort by index-level EBITDA-to-EV ratio (denoted $EBEV_{EW}$). Why EBITDA-to-EV ratio. First, EBITDA is well aligned with the carry concept because it approximates well the operational cash flow in a firm. Second, among many fundamental and valuation ratios, EBITDA-to-EV has one of the most reliable and stable relationships with future returns (Zaremba 2016a, b). The third factor is related to momentum, but we rely on a nonstandard approach in this case. Based on the findings of Lehmann (1990) and Jegadeesh (1990), the momentum usually is calculated with the last month skipped to avoid the impact of short-term reversal. Nevertheless, short-term reversal is a stock-level phenomenon, resulting largely from microstructural issues, and it is not observable at the country level. Zaremba (2016a) found evidence for short-term continuation rather than reversal. Also, classical momentum is usually measured over a 12-month

period to avoid the impact of seasonal effects on the stock market. Nonetheless, we are not aware of any study that has documented that the country-level expected returns vary cross-sectional due to calendar effects. Thus, cross-country momentum could be measured over different periods. We choose 9 months because, for this sorting period, the effect is the strongest. Finally, Jacobs et al. (2015) uncovered an interesting link between the momentum and skewness effects. They hypothesized that momentum profits are partially driven by skewness, and they argued that an additional sort of skewness visibly enhances the momentum profits. Both anomalies, i.e., momentum and skewness, have been found to be very pervasive (see Zaremba and Shemer (2016) for a comprehensive review). In summary, the third factor (denoted MS_{EW}) is based on the average ranking of 9-month momentum, including the most recent month and the past skewness of the return distribution.

Finally, when forming zero-investment portfolios, we abandon the Fama-French-style procedure of forming factors employed by, for example, Umutlu (2015) or Zaremba (2015a), which assumes double-sorted capitalization-weighted portfolios. We see two major drawbacks of this approach. First, given the large cross-sectional volatility of equity markets' capitalizations and the relatively small number of assets (in comparison with individual stocks), the performance of factor portfolios is highly influenced by the largest markets in the sample. Second, the capitalization-weighting scheme is not fully compatible with the standpoint of global country-level investors, who can basically build a portfolio of any weight easily using liquid futures contracts of ETFs. Thus, instead of the EMS model based on Fama-French-style capitalization-weighted portfolios, we opt for simple equal-weighted tertile zero portfolios. Nonetheless, we discuss, test, and compare both factor construction techniques.

Comparisons of asset-pricing models have usually been performed by examining portfolios from double or triple sorts based on a few popular return-prediction signals (e.g., Fama and French (2012), Cakici et al. (2013), Hanauer and Linhart (2015)). In fact, recent studies have indicated that the returns are considerably multidimensional (Green et al. 2017). Thus, we follow Zaremba and Czapkiewicz (2017), and we perform examinations over an entire group of country-level stock market anomalies. We use the external set of 15 anomalies selected by Zaremba (2016a) and attempt to explain their abnormal returns with various asset-pricing models. Furthermore, we additionally research the abilities of the examined asset-pricing models with each other's factors. The examinations are performed using a set of 78 country equity indices for 1995–2015.

Our main findings can be summarized as follows. First, the newly proposed asset-pricing factors, formed from equal-weighted zero portfolios based on the EBITDA-to-EV ratio ($E_{BEV_{EW}}$) and the combination of 9-month momentum and skewness (EMS_{EW}), are more reliable and more robust sources of return than the standard asset-pricing factors. In the gross return approach, they delivered a mean monthly return of 0.71 and 0.62%, respectively, while the returns on Fama-French-like country-level value, size and momentum factors did not significantly differ from 0 over the examination period.

Second, the new three-factor model explains the cross-sectional patterns much better than the standard country-level four-factor model, based on value, size, and momentum. Of 60 examined portfolios, i.e., the 15 anomalies using four alternative approaches (including gross and net returns, and equal and capitalization weighting).

Third, the EMS_{EW} model explains much better the four-factor models' factors in reverse. When the EMS_{EW} is applied to the four-factor model factors, none of the factors has unexplained intercepts. In contrast, when the four-factor model is used for the EMS_{EW} factors, both $E_{BEV_{EW}}$ and MS_{EW} are characterized by abnormal returns. Our study contributes in two basic manners. From an academic standpoint, it provides a better understanding of asset pricing at the country level. In addition, from a practical perspective, it offers new tools for investors that could be used by international investors.

The remainder of the chapter proceeds as follows. Section 2 discusses the data sources and the research methods, i.e., the set of examined anomalies, construction of factor portfolios, and the asset-pricing tests. Subsequently, the performance of the anomaly and factor portfolios, as well as the comparison of asset-pricing models, is presented in Sect. 3. Finally, Sect. 4 concludes the paper.

2 Data and Methods

The aim of this study is to examine a set of country-level asset-pricing models. Thus, we perform two types of asset-pricing examinations. First, we form a number of anomaly-based zero-investment portfolios and assess their performance with multi-factor models. Second, we investigate the extent to which the models' asset-pricing factors are able to explain each other's performance.

2.1 Data Sources and Sample Preparation

The calculations in this paper are based on returns on international stock market indices from 78 countries including, replicating the sample from Zaremba (2016b). The sample period runs from January 1995 to June 2015, as available (246 monthly observations). The risk-free rate is the Bloomberg generic US 3-month T-bill.

2.2 Country-Level Anomalies

This study includes the examination of the performance of long/short zero-investment portfolios based on country-level anomalies. This section provides a short review of them.

To avoid any over-optimization, we used a set of anomalies from external sources and tested the inter-market cross-sectional return patterns chosen in a paper by Zaremba (2016a) as robust and reliable. Furthermore, when replicating the anomalies and testing the portfolios, we closely follow the approach of Zaremba (2016a). The precise description of the examined anomalies is presented in the Appendix. The anomalies could be generally categorized into four categories.

- *Group 1: momentum.* We examine five distinct strategies related to the momentum effect. The first strategy is the original short-term momentum (1) with a 6-month sorting period, developed by Jegadeesh and Titman (1993). The inter-market parallels of the momentum anomalies were investigated by Asness et al. (1997), Bhojraj and Swaminathan (2006), and Balvers and Wu (2006). Next, Novy-Marx (2012) argued that the key source of momentum is the intermediate performance over months $t - 12$ to $t - 7$ (2). Furthermore, Zhang (2006) showed that stock market capitalization might amplify the sources underlying momentum and subsequently enhance the profits. Zaremba (2015a) confirmed this effect at the country level, i.e., that the momentum is stronger across small countries (3). Finally, there is ample academic evidence of the profitability of technical trading signals based on the momentum phenomenon, e.g., the strategies based on moving averages (a comprehensive review is provided by, e.g., Park and Irwin (2007)). Thus, following Jacobs (2015), we additionally include two moving average strategies based on 20-month and 24-month formation periods ((4), (5), e.g., Huddart et al. (2009) and Han et al. (2013)).
- *Group 2: quality.* At the country level, two particular anomalies that are related to the financial standing of an entity turn out to be particularly robust, i.e., leverage and profitability. First, a number of recent papers have suggested that low levels of credit risk and indebtedness tend to be correlated with high future returns (Barbee et al. 1996; George and Hwang 2010; Caskey et al. 2012). Analogously, many practitioners employ indebtedness ratios—such as the assets-to-debt ratio (6) or EBITDA-to-debt ratio (7)—finding that low-leveraged high-quality companies have impressive performance (van de Maele and Jallet 2015). Zaremba (2015b) confirmed some country-level parallels and proved that stock markets with companies populated with low-leveraged companies display better historical performance than other markets.

Second, companies with high returns on equity ((8), e.g., Haugen and Baker (1996), Chen et al. (2011), Wang and Yu (2013)) outperform companies with low corresponding metrics. Garff (2014) proved that this pattern is also present at the country level.

- *Group 3: skewness.* One of the implications of the prospect theory developed by Kahneman and Tversky (1979) is that investors overvalue right-skewed assets and undervalue left-skewed assets. Thus, the country equity markets with high positive skewness of prior (or expected) return should underperform the markets with negative skewness (9). The stock-level evidence for the influence of the skewness was provided by Kraus and Litzenberger (1976) and Harvey and

Siddique (2000), while Harvey (2000) and Zaremba (2016a) found a similar pattern across countries. Moreover, Bali et al. (2011) showed that the highest daily return in the previous month well approximates the expected skewness. This metric, additionally sorted by cumulative returns in the previous year, is strongly related to future returns both at the stock ((10), e.g., Jacobs et al. (2015)) and country levels (Zaremba 2016a, b).

- *Group 4: value investing.* A number of studies have indicated that stocks with high fundamentals relative to price outperform stocks with low fundamentals. This phenomenon is robust and has been documented with the use of multiple valuation ratios. In this study, we also examine these metrics, which have proved reliable at both the stock and country levels: earnings-to-price-ratio ((11); e.g., Basu (1983)); dividend yield ((12), e.g., Litzenberg and Ramaswamy (1979)); cash flow-to-price ratio ((13) e.g., Lakonishok et al. (1994)); EBITDA-to-EV ratio ((14), e.g., Loughran and Wellman (2012)); and EBITDA-to-price ratio ((15), Mesale (2008)). The evidence of country-level parallels of these effects was provided by Macedo (1995), Asness et al. (1997), Kim (2012), and Zaremba (2015a).

Based on the 15 aforementioned anomalies, we form portfolios using a uniform procedure across all of the strategies, closely following Zaremba (2016a). Also, as Zaremba (2016a), we initially examine the anomalies with two asset-pricing models: country-level CAPM (Sharpe 1964) and US Carhart (1997) model based on Kenneth French's data (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html).

2.3 Asset-Pricing Models

For the purposes of this study, we examine the explanatory powers of a number of inter-market asset-pricing models, based on cross-sectional data. The first three models are the country-level parallels of the traditional models that are frequently employed in studies of financial markets. In this chapter, we examine the country-level parallels of these models, which are based and applied to equity country indices. The first three models are country-level models sourced from Zaremba (2015a). Let us start with the Capital Asset Pricing Model (Sharpe 1964), abbreviated CAPM:

$$R_{i,t} = \alpha_i + R_{f,t} + \beta_{rm,i} \cdot (R_{m,t} - R_{f,t}) + \varepsilon_{i,t}, \quad (1)$$

where $R_{i,t}$, $R_{m,t}$, and $R_{f,t}$ are returns on the analyzed asset i , market portfolio and risk-free asset at time t , respectively, and α_i and $\beta_{rm,i}$ are regression parameters. The second model is the Fama-French three-factor model (Fama and French 1993):

$$R_{i,t} = \alpha_i + R_{f,t} + \beta_{rm,i} \cdot (R_{m,t} - R_{f,t}) + \beta_{SMB,i} \cdot SMB_t + \beta_{HML,i} \cdot HML_t + \varepsilon_{i,t}, \quad (2)$$

where $\beta_{rm, i}$, β_{SMB} , β_{HML} , and α_i are the estimated parameters of the model for the asset I , $\beta_{rm, i}$ is analogous, but not equal, to the CAPM beta, and $\beta_{SMB, i}$ and $\beta_{HML, i}$ are parameters referring to exposures to SMB_t (small minus big) and HML_t (high minus low) risk factors, which denote returns on zero-cost arbitrage portfolios. The third model is the Carhart's (Carhart 1997) four-factor model:

$$R_{i,t} = \alpha_i + R_{f,t} + \beta_{rm,i} \cdot (R_{m,t} - R_{f,t}) + \beta_{SMB,i} \cdot SMB_t + \beta_{HML,i} \cdot HML_t + \beta_{WML,i} \cdot WML_t + \varepsilon_{i,t}. \quad (3)$$

where the WML_t (winners minus losers) is the difference between returns on diversified winner and loser portfolios over the previous year.

The next models are new models proposed in this study. These models include three additional factors that are constructed analogously to the HML or WML factors: $EBEV_{CW,t}$, $MOM_{CW,t}$, and $SKEW_{CW,t}$:

$$R_{i,t} = \alpha_i + R_{f,t} + \beta_{rm,i} \cdot (R_{m,t} - R_{f,t}) + \beta_{EBEVCW,i} \cdot EBEV_{CW,t} + \beta_{MOMCW,i} \cdot MOM_{CW,t} + \varepsilon_{i,t}, \quad (4)$$

$$R_{i,t} = \alpha_i + R_{f,t} + \beta_{rm,i} \cdot (R_{m,t} - R_{f,t}) + \beta_{EBEVCW,i} \cdot EBEV_{CW,t} + \beta_{SKEWCW,i} \cdot SKEW_{CW,t} + \varepsilon_{i,t}, \quad (5)$$

$$R_{i,t} = \alpha_i + R_{f,t} + \beta_{rm,i} \cdot (R_{m,t} - R_{f,t}) + \beta_{EBEVCW,i} \cdot EBEV_{CW,t} + \beta_{MOMCW,i} \cdot MOM_{CW,t} + \beta_{SKEWCW,i} \cdot SKEW_{CW,t} + \varepsilon_{i,t}. \quad (6)$$

where $EBEV_{CW}$, MOM_{CW} , $SKEW_{CW}$ are returns on diversified portfolios that are analogous to HML or WML factors and that include long (short) positions in markets with high (low) EBITDA-to-EV, high (low) 9-month momentum, and low (high) skewness, correspondingly. $\beta_{EBEVCW, i}$, $\beta_{MOMCW, i}$, and $\beta_{SKEWCW, i}$ are the respective model parameters.

Next, we also substitute the MOM_{CW} and $SKEW_c$ factors with an integrated factor based both on momentum and skewness: $MS_{CW,t}$. Its corresponding equation parameter is represented by $\beta_{MSCW, i}$:

$$R_{i,t} = \alpha_i + R_{f,t} + \beta_{rm,i} \cdot (R_{m,t} - R_{f,t}) + \beta_{EBEVCW,i} \cdot EBEV_{CW,t} + \beta_{MS,i} \cdot MS_{CW,t} + \varepsilon_{i,t}. \quad (7)$$

Finally, we also reexamine models (4)–(7) with an alternative specification of the factor portfolios. In this approach, we simply use the zero-investment equal-weighted factor portfolios, based on EBITDA-to-EV ratio ($EBEV_{EW}$), 9-month momentum (MOM_{EW}), skewness ($SKEW_{EW}$), and skewness and momentum combined (MS_{EW}). The factors' corresponding to these parameters are $\beta_{EBEVEW, i}$, $\beta_{MOMEW, i}$, $\beta_{SKEWEW, i}$, and $\beta_{MSEW, i}$.

$$R_{i,t} = \alpha_i + R_{f,t} + \beta_{rm,i} \cdot (R_{m,t} - R_{f,t}) + \beta_{EBEVEW,i} \cdot EBEV_{EW,t} + \beta_{MOMCW,i} \cdot MOM_{EW,t} + \varepsilon_{i,t}, \quad (8)$$

$$R_{i,t} = \alpha_i + R_{f,t} + \beta_{rm,i} \cdot (R_{m,t} - R_{f,t}) + \beta_{EBEVEW,i} \cdot EBEV_{EW,t} + \beta_{SKEWCW,i} \cdot SKEW_{EW,t} + \varepsilon_{i,t}, \quad (9)$$

$$R_{i,t} = \alpha_i + R_{f,t} + \beta_{rm,i} \cdot (R_{m,t} - R_{f,t}) + \beta_{EBEVEW,i} \cdot EBEV_{EW,t} + \beta_{MOMCW,i} \cdot MOM_{EW,t} + \beta_{SKEWCW,i} \cdot SKEW_{EW,t} + \varepsilon_{i,t}, \quad (10)$$

$$R_{i,t} = \alpha_i + R_{f,t} + \beta_{rm,i} \cdot (R_{m,t} - R_{f,t}) + \beta_{EBEVEW,i} \cdot EBEV_{EW,t} + \beta_{MS,i} \cdot MS_{EW,t} + \varepsilon_{i,t}. \quad (11)$$

For simplicity, in the chapter, we denote the aforementioned models as follows: (1) CAPM, (2) 3F, (3) 4F, (4) EMom_{CW}, (5) ESkew_{CW}, (6) EMomSkew_{CW}, (7) EMS_{CW}, (8) EMom_{EW}, (9) ESkew_{EW}, (10) EMomSkew_{EW}, and (11) EMS_{EW}.

All of the regression parameters are estimated using the OLS method. According to our null hypothesis, all of the intercepts are equal to zero, whereas the alternative hypothesis assumes the contrary. To verify whether the intercepts in a group of portfolios are significantly different from zero, they are evaluated with the common GRS test statistics, as recommended by Gibbons et al. (1989).

2.4 Asset-Pricing Factors

The examined models include a number of factor portfolios. These factors can basically be grouped into three main categories. The first category includes MktRf (denoted $R_{m,t} - R_{f,t}$ in Eqs. (1)–(11)), which is common for all of the models. MktRf is the difference between capitalization-weighted returns on all indices (countries) in the research sample and the Bloomberg generic US 3-month T-bill.

The second category includes the factors that are designed identically as the standard Fama-French (Fama and French 1993) factors but based on indices. These factors are indicated with the subscript *CW* to indicate that they are based on capitalization-weighted portfolios. The HML and SMB factors can serve as an example. The returns on explanatory factors are constructed on the basis of 2×3 sorts by size (total stock market capitalization) and the book-to-market ratio (B/M). At the end of each month t , all of the indices are sorted by size and B/M. Large and small markets are defined, respectively, as index portfolios with a total market value greater and less than the median in a given month t . The B/M breakpoints in the 2×3 sorts are the 30th and the 70th percentiles of B/M for all of indices in time t . For this and further ratios, the accounting data are weighted according to the index methodology. Next, they are related to the total index capitalization to obtain a given ratio. Furthermore, whenever we use accounting data in the index calculation, the accounting data are lagged 3 months to avoid look-ahead bias. For example, to sort

the markets by B/M in period t , we use stock market capitalization from the end of period $t - 1$ and book values from the end of period $t - 4$.

The intersection of independent 2×3 sorts by size and B/M results in six portfolios—SH, SN, SL, BH, BN, and BL—where S and B indicate small and large, and H, N, and L indicate high, neutral, and low values of B/M (top 30%, middle 40%, and bottom 30% of B/M), respectively. The next stage is the computation of monthly value-weighted returns for all six portfolios. Finally, the SMB size factor is calculated as the equal-weighted average of returns on three small stock portfolios from the 2×3 size-B/M sorts minus the average return on three large stock portfolios. The HML value factor is the difference between equal-weighted returns on top B/M portfolios (BH, SH) and equal-weighted average return on growth portfolios (BL, SL).

The remaining capitalization-weighted factors are built in an analogous manner to the HML_{CW} factor but with the indices sorted by different variables. To form the WML_{CW} factor, we replace the B/M with lagged momentum returns. In the case of portfolios built at the end of month $t - 1$, lagged momentum return is the cumulative return on stocks for the period $t - 12$ to $t - 2$. In the case of the $EBEV_{CW}$ factor, the markets are ranked by the EBITDA-to-EV ratio at the end of month $t - 1$. The MOM_{CW} factor portfolios are formed from the cumulative return in months $t - 9$ to $t - 1$. The design of skewness portfolios ($SKEW_{CW}$) is slightly different because the countries are ranked by reverse skewness of the return distribution in months $t - 24$ to $t - 1$. In other words, the countries are ranked from the lowest skewness to the highest skewness, so that the top portfolio includes the most left-skewed indices, while the bottom portfolio includes the most right-skewed indices. Finally, the MS_{CW} factor is based on both 9-month momentum and 24-month skewness. To this end, we first sort the markets independently by cumulative return in months $t - 9$ to $t - 1$ (descending order) and by the skewness of the returns in months $t - 24$ to $t - 1$ (ascending order). Next, we average both rankings and use the averaged positions as a basis to form 2×3 constituent portfolios. Finally, the third category includes four equal-weighted factors based on the same metrics as the aforementioned $EBEV_{CW}$, MOM_{CW} , $SKEW_{CW}$, and MS_{CW} : EBITDA-to-EV ratio, 9-month momentum, 24-month skewness, and momentum and skewness combined, respectively. These factors are denoted $EBEV_{EW}$, MOM_{EW} , $SKEW_{EW}$, and MS_{EW} . To form these factors, the examined country equity markets are ranked against the respective variables at the end of month $t - 1$. Subsequently, the markets included in the top and the bottom tertiles are equally weighted to form portfolios. Eventually, we form zero-investment portfolios that encompass long positions in the top tertile portfolios and short positions in the bottom tertile portfolios. Thus, the last category of factors is formed in a similar fashion as equal-weighted anomaly portfolios.

In the examination of anomaly-based zero-investment portfolios, we apply the aforementioned models to a set of 60 zero portfolios, which include 15 portfolios in four alternative approaches: equal-weighted portfolios based on gross returns (denoted EWG), equal-weighted portfolios based on net returns (EWN), capitalization-weighted portfolios based on gross returns (denoted CWG), and capitalization-weighted portfolios based on net returns (EWN).

2.5 Robustness Checks

We perform a number of robustness tests to verify the results of this study. The checks are applied at various stages of the research:

- *Alternative weighting schemes.* When forming anomaly-based portfolios, we examine the two most popular weighting schemes: equal- and capitalization-based.
- *Adjustment for taxes on dividends.* The most popular approach in country-level studies assumes calculations based on gross returns, i.e., without adjusting for the taxes on dividends. For robustness, the alternative “net” approach was also applied. The “net” convention of the indices indicates that dividends are calculated on an after-tax basis. This approach provides control for different tax rates on dividends in various countries.
- *Alternative currency approaches.* The basic study presents the investments denominated in US dollars. We reexamine all of the computations using the euro and Japanese yen. We find no qualitative differences in results, so for brevity, we do not report these outcomes.
- *Alternative breakpoints.* In addition to the tertile approach, we reexamine the portfolios that underpin the asset-pricing factors, so we use the 20th and 80th percentiles as cutoff points. These portfolios are less diversified and thus more volatile.

3 Results

In this section, we present an overview of the outcomes of our investigations. First, we recap the performance of the 15 country-level anomalies. Next, we describe the characteristics of the asset-pricing factors used in this study, focusing particularly on the new factors. Finally, we summarize the results of the asset-pricing tests.

3.1 Overview of the Anomalies

Table 1 summarizes the performance of the anomalies, described in detail in Table in Appendix, which serve as a basis for cross-sectional asset-pricing tests in this study. All of the anomalies deliver significant alphas that survive the application of the global CAPM and the US stock-level four-factor asset-pricing model. Interestingly, not all of the anomalies are equally reliable in the capitalization- and equal-weighting approaches. For example, the momentum strategies work almost solely for the equal-weighted portfolios, whereas the ROE-based portfolios overperform particularly in the capitalization-weighted approach. In summary, the most profitable strategies turn out to be the value strategies based on EBITDA: EBP and EBEV.

Table 1 Performance of individual country-level stock market anomalies

	Equal-weighted portfolios										Capitalization-weighted portfolios									
	Gross returns					Net returns					Gross returns					Net returns				
	<i>R</i>	<i>a</i> _{CAPM}	<i>a</i> _{IF}	SR	<i>R</i>	<i>a</i> _{CAPM}	<i>a</i> _{IF}	SR	<i>R</i>	<i>a</i> _{CAPM}	<i>a</i> _{IF}	SR	<i>R</i>	<i>a</i> _{CAPM}	<i>a</i> _{IF}	SR				
StMom	0.43* (1.68)	0.50** (2.22)	0.40* (1.66)	0.39	0.48* (1.70)	0.53** (2.36)	0.41* (1.69)	0.43	0.11	0.17	0.01	0.08	-0.08	-0.06	-0.13	-0.06				
IntMom	0.63*** (3.03)	0.67*** (3.22)	0.52** (2.51)	0.67	0.57** (2.35)	0.61*** (2.67)	0.44* (1.88)	0.56	0.17	0.16	-0.06	0.12	-0.30	-0.32	-0.47	-0.24				
MomSmall	0.47	0.61* (0.94)	0.35	0.24	0.58* (1.69)	0.60* (1.74)	0.45	0.39	0.82* (1.69)	0.94** (2.12)	0.69	0.39	0.81** (2.05)	0.83** (2.21)	0.68* (1.76)	0.50				
MA200	0.52* (1.94)	0.60** (2.56)	0.49** (2.01)	0.46	0.59** (2.13)	0.64*** (2.69)	0.50** (2.09)	0.51	0.17	0.24	0.11	0.12	0.01	0.04	-0.06	0.01				
MA250	0.51* (1.87)	0.59** (2.47)	0.46* (1.87)	0.44	0.61** (2.18)	0.66*** (2.73)	0.50** (2.10)	0.53	0.24	0.31	0.15	0.16	0.00	0.02	-0.08	0.00				
<i>Quality</i>																				
EqDebt	0.28	0.28	0.33* (1.31)	0.29	0.44** (1.96)	0.42** (2.05)	0.48** (2.17)	0.44	0.03	-0.10	-0.05	0.03	0.67*** (2.80)	0.66** (2.52)	0.56** (2.08)	0.58				
EBDebt	0.38** (1.99)	0.35* (1.79)	0.39* (1.91)	0.42	0.43** (2.34)	0.43** (2.19)	0.45** (2.23)	0.48	0.67*** (2.87)	0.59** (2.30)	0.53** (1.96)	0.56	0.51** (2.12)	0.47* (1.74)	0.41	0.43				
ROE	0.14	0.18	0.09	0.15	0.04	0.07	-0.03	0.04	0.64*** (2.65)	0.58** (2.46)	0.49** (2.05)	0.59	0.59** (2.39)	0.56** (2.31)	0.46** (1.96)	0.56				
<i>Skewness</i>																				
Skew	0.36** (2.21)	0.32* (1.86)	0.28* (1.65)	0.49	0.41** (2.12)	0.38** (1.97)	0.29	0.49	0.61** (2.57)	0.60*** (2.65)	0.58** (2.35)	0.59	0.28	0.27	0.29	0.30				
MomMax	0.51* (1.87)	0.64*** (3.18)	0.51** (2.40)	0.50	0.48* (1.67)	0.57** (2.45)	0.44* (1.82)	0.41	0.26	0.39* (1.68)	0.20	0.20	0.29	0.41	0.21	0.19				
<i>Value</i>																				
DY	0.19	0.20	0.23	0.23	0.58** (2.36)	0.72*** (3.35)	0.59*** (2.67)	0.52	0.44** (2.06)	0.37* (1.65)	0.34	0.40	0.65*** (3.02)	0.61*** (2.83)	0.51** (2.29)	0.66				
CFP	0.30* (1.69)	0.29* (1.76)	0.22	0.41	0.57** (2.02)	0.50** (1.98)	0.42	0.48	0.56** (2.48)	0.50** (2.27)	0.51** (2.31)	0.52	0.57** (2.47)	0.55*** (2.71)	0.49** (2.39)	0.64				

(continued)

Table 1 (continued)

	Equal-weighted portfolios						Capitalization-weighted portfolios									
	Gross returns			Net returns			Gross returns			Net returns						
	R	a_{CAPM}	a_{4F}	SR	R	a_{CAPM}	a_{4F}	SR	R	a_{CAPM}	a_{4F}	SR				
EP	0.30* (1.72)	0.27 (1.38)	0.23 (1.15)	0.35	0.34* (1.72)	0.30* (1.66)	0.29 (1.58)	0.35	0.50** (1.98)	0.39 (1.48)	0.35 (1.29)	0.40	0.93*** (3.92)	0.91*** (3.78)	0.78*** (3.23)	0.86
EBP	0.57** (2.44)	0.52** (2.48)	0.44** (2.18)	0.60	0.95*** (3.55)	0.90*** (3.75)	0.80*** (3.15)	0.83	0.91*** (3.44)	0.88*** (3.47)	0.83*** (3.15)	0.75	1.10*** (3.94)	1.04*** (3.97)	0.97*** (3.60)	0.92
EBEV	0.73*** (3.46)	0.70*** (3.34)	0.66*** (3.19)	0.79	0.82*** (3.39)	0.87*** (3.67)	0.73*** (3.11)	0.75	1.14*** (5.09)	1.11*** (4.51)	1.03*** (4.39)	1.03	0.89*** (3.60)	0.89*** (3.52)	0.78*** (3.25)	0.83

Note. The table presents the performance of equal and capitalization-weighted zero-investment portfolios based on individual country-level stock market anomalies. R is mean monthly return, SR is an annualized Sharpe ratio, and a_{CAPM} and a_{4F} are intercepts from the country-level CAPM and the US stock-level four-factor model, respectively. “Gross” and “net” approaches refer to the adjustment for taxes on dividends. The means and intercepts are expressed in percentage terms. The numbers in brackets are t -statistics based on bootstrap standard errors, and significance at the 10% level is indicated in bold characters. *, ** and *** indicate values significantly different from zero at the 10, 5, and 1% levels, respectively. The symbols for the strategies are explained in Appendix

Source: Prepared by the author

3.2 *Comparison of Asset-Pricing Models*

Table 2 summarizes the performance of the strategies underpinning the new asset-pricing factors examined in this study. The return pattern related to cross-sectional sorting by EBITDA-to-EV ratio (Panel A) provides significant alphas relative to the global CAPM and the US four-factor-model in almost all of the configurations examined. The mean raw returns vary from 0.58% to 0.91% monthly, depending on the precise portfolio formation approach. The Sharpe ratios are in the range of 0.40–0.81, so they are also very high.

Panel B of Table 2 displays the performance of portfolios based on 9-month momentum. These raw and risk-adjusted returns do not resemble the robust performance of the strategies based on the EBITDA-to-EV ratio. Analogous to Zaremba (2016a), we find that the inter-market momentum strategy works almost exclusively for the equal-weighted portfolios. The mean returns for the gross tertile equal-weighted approach are equal to 0.58%. Thus, they are lower than for the EBITDA-to-EV ratio but nonetheless higher than for the standard 12-month momentum with the last month skipped. In this case, the mean returns on the zero portfolios over the study periods decrease by 0.1–0.2 percentage points monthly, while the capitalization-weighted portfolios display even negative returns (Zaremba 2016a, b). In summary, although the returns on the portfolios from sorts by 9-month momentum are not as profitable as the EBITDA-to-EV-portfolios, they still perform much better than the standard-momentum strategy, which usually turns out to be insignificant over the study period.

The skewness-based strategy (Panel C of Table 2) proves to be more robust than the momentum, but it is also far from perfect. The strategy delivers significant mean returns and alphas for all of the equal-weighted tertile portfolios and the capitalization-weighted tertile portfolio in the gross approach, as well as for all of the capitalization-weighted quintile portfolios. Nonetheless, the mean returns on equal-weighted quintile portfolios are as low as 0.24–0.28% monthly and thus are insignificant.

Finally, the last part (Panel D) of Table 2 provides information about the performance of the zero-investment portfolio formed on combined rankings of skewness and momentum. Their performance is basically comparable to the momentum strategy. The returns on the equal-weighted tertile portfolios exceed 0.60% monthly and display significant alphas. A similar pattern is revealed by the equal-weighted quintile portfolios in the gross return approach. Nevertheless, in the other approaches, the raw returns are smaller (0.00–0.49%) and thus insufficient to produce significant abnormal risk-adjusted returns.

Table 3 summarizes the performance of the Fama-French-style factors employed in this study. Strikingly, the returns on the zero portfolios are not particularly impressive, perhaps because the capitalization-weighted portfolios, although they come from double-sorts by size, have returns that are heavily influenced by the largest markets in the subsample. As a result, the cross-sectional returns patterns are not as vivid as for the equal-weighted portfolios. Consequently, over the investigated

Table 2 Performance of selected anomalies underpinning the asset-pricing models

	Raw returns		Volatility	Sharpe ratio	Global CAPM		US 4-factor model	
	Mean	t-stat			Intercept	t-stat	Intercept	t-stat
<i>Panel A: EBITDA-to-EV ratio</i>								
EWG (tertile)	0.71***	(3.48)	3.20	0.77	0.66***	(3.18)	0.60***	(3.02)
EWN (tertile)	0.75***	(3.21)	3.70	0.71	0.71***	(3.04)	0.63***	(2.70)
CWG (tertile)	0.91***	(3.61)	3.94	0.81	0.86***	(3.29)	0.76***	(3.08)
CWN (tertile)	0.70***	(2.99)	3.90	0.62	0.67**	(2.52)	0.57**	(2.32)
EWG (quintile)	0.85***	(2.75)	4.42	0.67	0.82***	(2.89)	0.74***	(2.64)
EWN (quintile)	0.61*	(1.90)	4.33	0.49	0.59*	(1.94)	0.47*	(1.67)
CWG (quintile)	0.90***	(3.07)	5.15	0.60	0.78**	(2.38)	0.74**	(2.22)
CWN (quintile)	0.58*	(1.81)	5.00	0.40	0.53	(1.55)	0.43	(1.21)
<i>Panel B: Momentum</i>								
EWG (tertile)	0.58**	(2.17)	3.90	0.52	0.66***	(2.84)	0.53**	(2.27)
EWN (tertile)	0.51*	(1.88)	3.97	0.45	0.56**	(2.33)	0.40*	(1.70)
CWG (tertile)	0.32	(0.85)	5.04	0.22	0.42	(1.45)	0.24	(0.70)
CWN (tertile)	0.15	(0.34)	4.11	0.13	0.18	(0.70)	0.08	(0.25)
EWG (quintile)	0.67*	(1.86)	4.93	0.47	0.77**	(2.42)	0.59*	(1.81)
EWN (quintile)	0.49	(1.29)	4.69	0.36	0.52	(1.60)	0.41	(1.26)
CWG (quintile)	0.42	(0.89)	6.39	0.23	0.49	(1.24)	0.25	(0.68)
CWN (quintile)	0.02	(-0.07)	5.95	0.01	0.02	(0.06)	-0.14	(-0.25)
<i>Panel C: Skewness</i>								
EWG (tertile)	0.36**	(2.21)	2.56	0.49	0.32*	(1.86)	0.28*	(1.65)
EWN (tertile)	0.41**	(2.12)	2.91	0.49	0.38**	(1.97)	0.29	(1.55)
CWG (tertile)	0.61**	(2.57)	3.58	0.59	0.60***	(2.65)	0.58**	(2.35)
CWN (tertile)	0.28	(1.30)	3.20	0.30	0.27	(1.28)	0.29	(1.18)
EWG (quintile)	0.24	(1.04)	3.39	0.24	0.18	(0.82)	0.10	(0.39)
EWN (quintile)	0.28	(1.29)	3.25	0.30	0.24	(1.12)	0.21	(0.85)

CWG (quintile)	0.77**	(2.40)	4.54	0.59	0.73**	(2.36)	0.73**	(2.11)
CWN (quintile)	0.53*	(1.67)	4.10	0.45	0.51*	(1.68)	0.56*	(1.77)
<i>Panel D: Momentum & skewness</i>								
EWG (tertile)	0.62***	(2.83)	3.10	0.69	0.65***	(3.33)	0.55***	(2.82)
EWN (tertile)	0.63***	(2.65)	3.38	0.64	0.64***	(2.98)	0.50**	(2.40)
CWG (tertile)	0.32	(1.08)	4.21	0.26	0.36	(1.40)	0.22	(0.74)
CWN (tertile)	0.00	(0.03)	3.84	0.00	0.01	(0.11)	0.02	(0.10)
EWG (quintile)	0.66**	(2.34)	4.14	0.55	0.69**	(2.45)	0.55**	(1.99)
EWN (quintile)	0.38	(1.25)	3.89	0.34	0.39	(1.41)	0.32	(1.19)
CWG (quintile)	0.49	(1.50)	4.98	0.34	0.54	(1.63)	0.36	(1.10)
CWN (quintile)	0.16	(0.42)	4.69	0.12	0.17	(0.51)	0.13	(0.45)

Note. The table presents the performance of zero-investment portfolios based on four metrics described in the Methods section: EBITDA-to-EV ratio, momentum, skewness, and the combination of skewness and momentum. *Volatility* is a monthly standard deviation of returns, and *Sharpe ratio* is an annualized Sharpe ratio. EWG, EWN, CWG, and CWN are equal-weighted portfolios based on gross returns, equal-weighted portfolios based on net returns, capitalization-weighted portfolios based on gross returns, and capitalization-weighted portfolios based on net returns, respectively. “Tertile” and “quintile” refer to the top and bottom quintiles underpinning the zero-investment portfolios. The means, volatilities, and intercepts are expressed in percentage terms. The numbers in brackets are *t*-statistics based on bootstrap standard errors, and the significance at 10% level is indicated in bold characters. *, **, and *** indicate values significantly different from zero at 10, 5, and 1% levels, respectively

Source: Prepared by the author

Table 3 Excess returns and standard deviations of country-level asset-pricing factors

	SB	SN	ST	BB	BN	BT	TMB	TMB _s	TMB _L
Panel A: gross returns									
<i>Book-to-market ratio (HML)</i>									
Mean	0.10	0.44	0.66	0.71**	0.31	0.54	0.30	0.35	-0.08
	(0.18)	(1.14)	(1.22)	(2.28)	(0.86)	(1.19)	(0.78)	(0.54)	(-0.26)
Volatility	7.89	6.00	8.44	4.83	5.53	6.89	5.62	9.46	4.95
<i>Standard momentum (WML)</i>									
Mean	0.12	0.43	0.52	0.04	0.41	0.69*	0.39	0.57	0.26
	(0.24)	(1.02)	(1.05)	(0.08)	(1.23)	(1.76)	(1.31)	(1.32)	(0.70)
Volatility	7.99	6.40	7.04	6.96	5.09	5.98	4.30	6.17	5.50
<i>EBITDA-to-EV ratio (EBEV_{CW})</i>									
Mean	-0.14	0.76*	0.72	0.13	0.60*	1.15**	0.81***	0.65*	1.04***
	(-0.29)	(1.84)	(1.27)	(0.35)	(1.80)	(2.47)	(3.02)	(1.73)	(3.47)
Volatility	7.34	6.29	8.27	5.57	4.91	7.02	3.84	5.36	4.43
<i>9-month momentum (MOM_{CW})</i>									
Mean	0.52	-0.03	0.74*	0.35	0.63*	0.63*	0.13	0.14	-0.05
	(0.95)	(-0.07)	(1.67)	(0.76)	(1.83)	(1.69)	(0.42)	(0.34)	(-0.14)
Volatility	8.30	6.45	6.45	6.81	5.21	5.68	4.67	5.93	5.47
<i>Skewness (SKEW_{CW})</i>									
Mean	0.12	0.63	0.69	0.25	0.39	0.87**	0.37	0.22	0.48*
	(0.25)	(1.25)	(1.36)	(0.63)	(1.05)	(2.35)	(1.50)	(0.59)	(1.72)
Volatility	6.85	7.55	7.27	5.94	5.37	5.54	3.48	5.42	4.14
<i>Momentum & skewness combined (MS_{CW})</i>									
Mean	0.46	0.30	0.90*	0.20	0.49	0.93***	0.19	-0.03	0.55**
	(0.86)	(0.66)	(1.96)	(0.47)	(1.28)	(2.63)	(0.76)	(-0.08)	(1.98)
Volatility	7.96	6.86	6.42	6.24	5.63	5.29	3.54	5.42	4.08

<i>Other</i>		<i>Market (MktRF)</i>	<i>Size (SMB)</i>							
Mean		0.65*	-0.02							
Volatility		(1.71)	(-0.09)							
Panel B: Net returns										
<i>Book-to-market ratio(HML)</i>										
Mean		0.20	0.75*	0.88	0.30	0.43	0.51	0.33	0.25	0.21
Volatility		(0.36)	(1.83)	(1.65)	(0.83)	(1.11)	(1.06)	(0.86)	(0.37)	(0.69)
<i>Standard momentum (WML)</i>										
Mean		0.30	0.65	0.80*	0.25	0.34	0.25	0.21	0.53	-0.15
Volatility		(0.58)	(1.45)	(1.69)	(0.53)	(0.94)	(0.50)	(0.68)	(1.36)	(-0.42)
<i>EBITDA-to-EV ratio (EBEV_{CW})</i>										
Mean		0.47	0.62	0.84	0.19	0.47	0.86	0.55*	0.29	0.70**
Volatility		(1.03)	(1.46)	(1.54)	(0.47)	(1.37)	(1.62)	(1.85)	(0.70)	(2.18)
<i>9-month momentum (MOM_{CW})</i>										
Mean		0.70	0.32	0.71	0.42	0.46	0.31	-0.17	-0.17	-0.25
Volatility		(1.34)	(0.74)	(1.54)	(0.89)	(1.21)	(0.71)	(-0.53)	(-0.42)	(-0.70)
<i>Skewness (SKEW_{CW})</i>										
Mean		0.26	0.83*	0.74	0.29	0.25	0.67*	0.41*	0.42	0.29
Volatility		(0.56)	(1.81)	(1.47)	(0.69)	(0.62)	(1.73)	(1.79)	(1.20)	(1.19)
Volatility		6.51	6.47	6.96	5.76	5.53	5.47	3.18	4.82	3.45

(continued)

Table 3 (continued)

	SB	SN	ST	BB	BN	BT	TMB	TMB _s	TMB _L
<i>Momentum & skewness combined (MS_{CW})</i>									
Mean	0.60 (1.17)	0.59 (1.28)	0.86* (1.95)	0.44 (0.99)	0.15 (0.39)	0.67* (1.74)	0.15 (0.58)	0.05 (0.12)	0.14 (0.50)
Volatility	7.23	6.43	6.18	6.13	5.51	5.45	3.53	5.19	3.81
<i>Other</i>									
	<i>Market (MktRf)</i>								
	<i>Size (SMB)</i>								
Mean	0.90 (1.56)	0.23 (0.93)							
Volatility	9.02	3.46							

Note. The table reports excess returns and standard deviations of asset-pricing factors and their constituent portfolios based on the book-to-market ratio, standard momentum, EBITDA-to-EV ratio, 9-month momentum, skewness, and the combination of skewness and momentum. All of these metrics are described in detail in the Methods section. *Mean* is mean monthly return, and *Volatility* is a monthly standard deviation of returns, both expressed in percentage terms. SB, SN, ST, BB, BN, and BT are 6 capitalization-weighted portfolios from 2×3 independent intersections, where *S* and *B* indicate small or large (divided by the median market capitalization), and *L*, *N*, and *H* indicate low, neutral, and high, respectively (bottom 30%, middle 40%, and top 30% of an investigated metric). The TMB is the difference between equal-weighted returns on top-metric portfolios (BT, ST) and equal-weighted average return on bottom-metric portfolios (BB, SB). TMB_s and TMB_L are the differences between high-metric and low-metric portfolios within the small and large markets, respectively. The numbers in brackets are *t*-statistics based on bootstrap standard errors, and the significance at the 10% level is indicated in bold characters. *, **, and *** indicate values significantly different from zero at 10, 5, and 1% levels, respectively. Panels A and B present the gross and net approaches, respectively, i.e., unadjusted and adjusted for taxes on dividends

Source: Prepared by the author

period, almost none of the factor portfolios deliver significant positive returns. The sole exception is the factor portfolio formed on the EBITDA-to-EV ratio. In the remaining cases, the mean returns are not significantly different from 0, although they are historically positive on average during the study period.

The correlation among the factors is very low; the average correlation coefficient in the gross approach is only 0.09. Naturally, the correlation is higher among the portfolios with some common component, e.g., momentum. However, interestingly, the correlation is still very low between the Fama-French-style portfolios from sorts by the B/M (HML) and EBITDA-to-EV factors ($EBEV_{CW}$), and it equals 0.36 and 0.38 in gross and net approaches, respectively. This finding confirms the initial assumption that the country-level cross-sectional patterns related to the B/M and EBITDA-to-EV ratios have quite different underlying sources of returns.

3.3 Country-Level Asset-Pricing Tests

The outcomes of the asset-pricing tests, i.e., the examination of the sets of inter-market anomalies with various country-level asset-pricing models, are reported in Table 4. The first three columns display the performance of the standard asset-pricing models, presented in Eqs. (1)–(3), i.e., the CAPM, the three-factor model, and the four-factor model. The next four columns supplement the market factor with the Fama-French-style factors based on EBITDA-to-EV ratio, 9-month momentum, skewness, and the combination of the two last metrics (Eqs. (4)–(7)). Finally, the last four models substitute the capitalization-weighted Fama-French-style factors with simple zero-investment equal-weighted tertile portfolios (Eqs. (8)–(11)).

Basically, the CAPM does a rather poor job of explaining the abnormal returns on factor portfolios. Of 60 examined portfolios, i.e., 15 anomalies portfolios in four approaches (including gross and net returns and capitalization- and equal-weighting schemes), 38 have alphas significant at 10% and 15 of them at 1%. The GRS tests are rejected in all of the approaches with the exception of capitalization-weighted portfolios based on net returns, and the corresponding mean p -value is 1.97%. The mean absolute intercept is 0.50% monthly, and its corresponding mean bootstrap t -statistic is 2.01.

The application of the three-factor model (3F), which also considers the cross-country value and size effects, introduces a visible improvement. The number of unexplained intercepts falls to 31 and 6 for 10 and 1% significance thresholds, respectively. The average GRS p -value rises to 3.82%, although it is still only the capitalization-weighted net approach (CWN) that is rejected. Finally, the mean absolute intercept decreases by 0.17 percentage points, to 0.33%.

The inclusion of a standard 12-month momentum factor (WML) in the model displays some further improvement (4F). Under this asset-pricing model, there are only 22 alphas significant at the 10% level but still 8 alphas significant at 1% the level. Furthermore, the GRS tests are still strongly rejected for all of the approaches

Table 4 Summary of the asset-pricing models' ability to explain country-level anomalies

	CAPM	3F	4F	EMom _{CW}	ESkew _{CW}	EMom _{CW}	ESkew _{CW}	EMom _{CW}	ESkew _{CW}	EMom _{EW}	ESkew _{EW}	EMom _{EW}	ESkew _{EW}	EMom _{EW}	ESkew _{EW}
<i>Number of intercepts significantly different from 0</i>															
At 10%	38	31	22	26	23	22	22	18	16	10	24	10	11		
At 5%	34	24	15	19	17	20	20	15	7	5	19	5	5		
At 1%	15	6	8	12	9	16	16	3	0	0	5	0	0		
<i>Mean GRS test statistics</i>															
EWG	2.22***	1.93**	2.76***	2.41***	1.93**	2.32***	2.14**	2.14**	1.14	1.49	0.95	0.95	0.93		
EWN	2.30***	2.13**	2.74***	2.93***	2.12**	3.02***	2.48***	2.48***	1.88**	1.84**	1.69*	1.69*	1.68*		
CWG	2.39***	2.02**	2.28***	1.99**	1.77**	1.95**	1.74**	1.74**	1.81**	1.93**	1.78**	1.78**	1.63*		
CWN	1.66*	1.51	1.36	1.53*	1.25	1.55*	1.45	1.45	1.28	1.40	1.27	1.27	1.20		
Average	2.14	1.90	2.28	2.22	1.77	2.21	1.95	1.95	1.53	1.66	1.42	1.42	1.36		
<i>Mean GRS p-value</i>															
EWG	0.67	2.29	0.08	0.32	2.34	0.50	1.01	1.01	32.12	11.21	51.46	51.46	52.67		
EWN	0.51	1.04	0.08	0.04	1.08	0.02	0.25	0.25	2.78	3.26	5.71	5.71	5.80		
CWG	0.33	1.58	0.56	1.83	4.24	2.13	4.65	4.65	3.49	2.19	3.90	3.90	6.80		
CWN	6.35	10.38	17.43	9.70	23.64	9.15	13.01	13.01	21.73	15.35	22.29	22.29	27.66		
Average	1.97	3.82	4.54	2.97	7.83	2.95	4.73	4.73	15.03	8.00	20.84	20.84	23.23		
<i>Mean intercept</i>															
EWG	0.45	0.42	0.34	0.35	0.39	0.36	0.30	0.30	0.16	0.36	0.15	0.15	0.15		
EWN	0.55	0.36	0.32	0.35	0.38	0.39	0.32	0.32	0.21	0.34	0.17	0.17	0.17		
CWG	0.49	0.29	0.24	0.28	0.31	0.29	0.26	0.26	0.33	0.37	0.32	0.32	0.31		
CWN	0.51	0.26	0.24	0.29	0.27	0.28	0.26	0.26	0.35	0.33	0.30	0.30	0.30		
Average	0.50	0.33	0.29	0.32	0.34	0.33	0.28	0.28	0.26	0.35	0.24	0.24	0.23		
<i>Mean t-statistic corresponding to the intercept</i>															
EWG	2.05	2.00	1.75	1.72	1.81	1.87	1.34	1.34	0.81	1.49	0.74	0.74	0.70		
EWN	2.30	1.68	1.71	1.86	1.83	2.09	1.55	1.55	1.14	1.44	0.88	0.88	0.85		

CWG	1.79	1.16	1.11	1.20	1.27	1.25	0.99	1.24	1.22	1.13	1.08
CWN	1.92	1.09	1.11	1.28	1.12	1.29	1.05	1.33	1.17	1.10	1.09
Average	2.01	1.48	1.42	1.52	1.51	1.63	1.23	1.13	1.33	0.96	0.93

Note. The table reports measurements that present the degree to which anomalies produce alpha under various factor models examined in this study: the global CAPM, denoted CAPM; the global three-factor model, denoted 3F; the global four-factor model, denoted 4F; and the multifactor models based on portfolios from sorts of the EBITDA-to-EV ratio, 9-month momentum, skewness, and momentum and skewness combined: EMom_{CW}, ESkew_{CW}, EMomSkew_{CW}, EMS_{CW}, EMom_{EW}, ESkew_{EW}, EMomSkew_{EW}, and EMS_{EW}. The description of the models is presented in Sect. 2. CW refers to capitalization-weighted factor portfolios formed based on 2 × 3 sorts on capitalization and a given metric, while EW refers to zero-investment portfolios formed from equal-weighted quantile portfolios. The detailed factor portfolio formation procedures are described in the Methods section. For each model, the table reports the number of intercepts that significantly differ from 0 at 10, 5, and 1% levels; average *F*-statistics and *p*-values from the GRS tests of Gibbons et al. (1989); average absolute intercepts along with the corresponding average absolute *t*-statistics based on bootstrap standard errors. EWG, EWN, CWG, and CWN are equal-weighted portfolios based on gross returns, equal-weighted portfolios based on net returns, capitalization-weighted portfolios based on gross returns, capitalization-weighted portfolios based on net returns, respectively, and the *Average* is the mean of these four approaches. *, **, and *** indicate values significantly different from zero at the 10, 5, and 1% levels, respectively

Source: Prepared by the author

with the exception of capitalization-weighted net returns. The mean GRS p -value increases to 4.54%, while the mean absolute intercept decreases gently to 0.29%.

The models with the new Fama-French style factors perform comparably to the standard three- and four-factor models: they are characterized by similar GRS p -values, and they leave comparable numbers of unexplained intercepts. Nonetheless, the best performing model is EMS_{CW} , which includes only three factors: $MktRf$, $EBEV_{CW}$, and MS_{CW} . This model leaves only 18 alphas significant at the 10% level and 3 significant at the 1% level, markedly fewer than the standard inter-market four-factor model. The mean p -value corresponding to GRS tests is 4.73, and the average absolute intercept equals 0.28%, i.e., slightly less than for the Carhart's four-factor approach.

Finally, the models based on simple equal-weighted tertile portfolios outperform the models based on Fama-French-style factors. In fact, even the three-factor model $EMom_{EW}$, which is based on the EBITDA-to-EV ratio ($EBEV_{EW}$) and the 9-month momentum ($MOMEW$), performs better than all of the aforementioned models. It leaves no intercept unexplained at the 1% level and only 16 at the 10% level. The mean GRS p -value is 15.03%, and the GRS test for the equal-weighted gross and capitalization-weighted net approaches is no longer rejected even at the 10% level. The mean absolute intercept shrinks to 0.26%, and its corresponding mean t -statistic equals 1.13.

Analogously, as for the Fama-French-style portfolios, in the equal-weighted-factor approach, the best performing model is also the EMW_{EW} three-factor model, which includes zero-investment portfolios based on the EBITDA-to-EV ratio ($EBEV_{EW}$) and the averaged rankings of momentum and skewness (MS_{EW}). The model is not able to explain only 11 intercepts at the 10% level, but it fully explains all of them at the 1% level. The mean GRS p -value equals 23.23%, and for any set of portfolios, this test is no longer rejected at the 5% level. Finally, the mean intercept amounts to only 0.23%. In summary, the three-factor EMS_{EW} model based on market risk, the EBITDA-to-EV ratio, and the combination of momentum and skewness is the best performing model among all those examined. In particular, it works much better than the models based on Fama-French-style factors, including the popular classical three- and four-factor models accounting for value, size, and momentum.

In addition the examination of the inter-market anomalies, we also follow Stambaugh and Yuan (2017) and investigate the asset-pricing models' abilities to explain each other's factors. We focus on three models that synthesize the three group of models that we test: the standard four-factor model 4F, represented by Eq. (3); and the two models with factors— EMS_{CW} and EMS_{EW} —based on the EBITDA-to-EV ratio and the combination of the 9-month momentum and skewness in both the Fama-French-like and equal-weighted approaches. The outcomes of these exercises are displayed in Table 5. We omit the market factor from the presentation because it is present in all of the models.

First, the factors of the standard four-factor model are easily explained by the alternative EMS_{EW} and EMS_{CW} models. None of the factors in either the gross or net approaches leaves any of the intercepts unexplained. In other words, these factors

Table 5 Summary of the models' ability to explain each other's factors

	Intercepts calculated with respect to the given model					
	Gross returns			Net returns		
	4F	EMS _{CW}	EMS _{EW}	4F	EMS _{CW}	EMS _{EW}
<i>Factors in 4F</i>						
SMB		-0.07	-0.06		0.03	0.11
		(-0.33)	(-0.17)		(0.20)	(0.46)
HML		0.45	0.36		0.48	0.31
		(1.55)	(0.99)		(1.65)	(0.72)
WML		0.17	-0.10		0.14	-0.17
		(0.71)	(-0.38)		(0.54)	(-0.64)
<i>Factors in EMS_{CW}</i>						
EBEV _{CW}	0.72***		0.31	0.44*		0.10
	(3.17)		(1.52)	(1.75)		(0.48)
MS _{CW}	0.28		0.01	0.25		-0.21
	(1.52)		(0.08)	(1.30)		(-0.89)
<i>Factors in EMS_{EW}</i>						
EBEV _{EW}	0.50***	0.09		0.39**	0.15	
	(2.78)	(0.56)		(2.12)	(1.10)	
MS _{EW}	0.44***	0.34**		0.39**	0.36**	
	(2.86)	(1.97)		(2.55)	(2.21)	
<i>Supplementary factors</i>						
SKEW _{CW}	0.52**		0.18	0.54**		0.28
	(2.52)		(0.89)	(2.47)		(1.16)
MOM _{CW}	-0.33*		-0.35	-0.32		-0.54**
	(-1.76)		(-1.52)	(-1.64)		(-2.51)
SKEW _{EW}	0.50***	0.26		0.44***	0.31*	
	(2.99)	(1.61)		(2.91)	(1.94)	
SKEW _{EW}	0.22	0.25		0.20	0.27	
	(1.17)	(0.94)		(1.11)	(1.06)	

Note. The table reports the factor's estimated alphas (in percentage terms) with respect to three country-level asset-pricing models: global four-factor model (4F) and two models based on market risk, EBITDA-to-EV ratio, and momentum and skewness combined (EMS_{CW}, EMS_{EW}). EMS_{CW} is the model based on capitalization-weighted factor portfolios formed from 2 × 3 sorts on capitalization and a given metric, while EMS_{EW} refers to the model based on zero-investment portfolios formed from equal-weighted quantile portfolios. The models attempt to explain the performance of factors based on the following metrics: *SMB* stock market capitalization, *HML* book-to-market ratio, *WML* standard momentum, *EBEV* EBITDA-to-EV ratio, *MOM* 9-month momentum, *SKEW* skewness, and *MS* momentum and skewness combined. EW factors are equal-weighted zero-investment portfolios, while CW factors have the HML structure described in Sect. 2. The numbers in brackets are *t*-statistics based on bootstrap standard errors, and significance at the 10% level is indicated in bold characters. *, **, and *** indicate values significantly different from zero at the 10, 5, and 1% levels, respectively

Source: Prepared by the author

deliver no reliable alphas under our models. In contrast, the factors of the EMC_{CW} model are fully explained by the EMS_{EW} model but not by the classic four-factor model. While the four-factor model is able to explain the performance of MS_{CW} , the alphas on $EBEV_{CW}$ are positive and highly significant.

Finally, the factors of the EMS_{EW} model pose the biggest challenge for alternative models. The standard four-factor model is unable to explain the abnormal performance of any of its factors. The EMS_{CW} does a partial job because it copes well with the EBITDA-to-EV based zero-investment portfolio ($EBEV_{EW}$), but it still does not explain the portfolios formed by the combination of skewness and momentum (MS_{EW}).

The table also shows the performance of supplementary factors that are based solely on skewness and momentum. Basically, this section emphasizes that the skewness anomaly poses a significant challenge for the standard model. In all of the approaches, it is characterized by positive and significant alphas.

In summary, Table 5 confirms that EMS_{EW} is the best performing model and works much better than, for example, the standard country-level four-factor model. While EMS_{EW} easily explains the performance of the classical factors based on the B/M ratio, stock market capitalization, and 12-month momentum, the standard four-factor model is not able to explain the abnormal returns on the EMS_{EW} factor portfolios.

4 Conclusion

In this chapter, we offer a new country-level multifactor asset-pricing model. The model aims to correct the inefficiencies of the popular asset-pricing models, based on value, size, and momentum. These models rely on factors that do not explain cross-country cross-sectional return patterns well and lack convincing evidence for the inherent long-term risk premiums. Our EMS_{EW} three-factor model is based on the market portfolio and on the zero portfolios formed by the EBITDA-to-EV ratio and skewness-enhanced momentum. The model explains the returns on country-level anomalies markedly better than the standard models. Furthermore, it copes well with explaining the performance of the standard models' factors, while the standard models leave the EMS_{EW} factors with significant and positive abnormal returns.

Nonetheless, this study has two limitations of potentially large importance. First, it does not account for transactions. Second, the research does not consider a number of country-specific issues, such as the cross-country capital-flow constraints or the institutional development of local financial markets.

Further research on the issues discussed in this chapter could be pursued in several directions. First, the future country-level asset-pricing studies could integrate and extend our asset-pricing models with further potential determinants of the equity returns development of corporate governance, investor protection, country political risk, etc. Second, the examination of linkages between the cross-sectional return patterns displayed in this study and local economic aggregates, such as inflation or

GDP growth, might be researched. Finally, the additional consideration of transaction costs and capital mobility constraints would provide further interesting insights into the determination of future returns across equity markets.

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Appendix

Anomalies examined in the study

No.	Abbr.	Description	Stock-level key reference papers	Key references for evidence on country-level parallels	Calculation details
<i>Group 1: Momentum</i>					
1	StMom	Stocks of firms that outperformed over the past 6 months continue to outperform over the next month.	Jegadeesh and Titman (1993)	Asness et al. (1997), Bhojraj and Swaminathan (2006), Balvers and Wu (2006)	We rank markets based on their cumulative return in months $t - 1$ to $t - 6$. We go long (short) in the markets with the high (low) return.
2	IntMom	Intermediate returns (i.e., in months $t - 12$ to $t - 7$) cause momentum.	Novy-Marx (2012)	Zaremba (2016a)	We rank markets based on their cumulative return in months $t - 12$ to $t - 7$. We go long (short) in the markets with the high (low) return.
3	MomSmall	Momentum is stronger among small firms.	Jegadeesh and Titman (1993), Hong et al. (2000), Zhang (2006)	Zaremba (2016a)	First, we sort markets by size as characterized in anomaly (4) and determine the median. We go long (short) in the markets with the high (low) return.
4	MA200	The ratio of current price to the 20-month moving average positively predicts returns.	Huddart et al. (2009), Han et al. (2013)	Zaremba (2016a)	We sort markets by the relationship of price in month $t - 1$ to the mean price in

(continued)

No.	Abbr.	Description	Stock-level key reference papers	Key references for evidence on country-level parallels	Calculation details
					months $t - 20$ to $t - 1$. We go long (short) in the markets with high (low) ratios.
5	Ma250	The ratio of current price to the 24-month moving average positively predicts returns.	Huddart et al. (2009), Han et al. (2013)	Zaremba (2016a)	We sort markets by the relationship of price in month $t - 1$ to the mean price in months $t - 24$ to $t - 1$. We go long (short) in the markets with high (low) ratios.
<i>Group 2: Quality</i>					
6	EqDebt	Firms with low leverage underperform companies with high leverage.	George and Hwang (2010), Caskey et al. (2012), van de Maele and Jallet (2015)	Zaremba (2016a)	We sort markets by the ratio of common equity to debt in month $t - 4$. We go long (short) in the markets with high (low) ratios.
7	EBDebt	Firms with high EBITDA-to-debt ratios underperform companies with low EBITDA-to-debt ratios.	George and Hwang (2010), Caskey et al. (2012), van de Maele and Jallet (2015)	Zaremba (2016a)	We sort markets by the ratio of trailing four-quarter EBITDA-to-debt in month $t - 4$. We go long (short) in the markets with high (low) ratios.
8	ROE	Firms with high return on equity outperform firms with low return on equity.	Haugen and Baker (1996), Chen et al. (2011), Wang and Yu (2013)	Garff (2014)	We sort markets by the ratio of trailing four-quarter net profit to common equity in month $t - 4$. We go long (short) in the markets with high (low) ratios.
<i>Group 3: Skewness</i>					
9	Skew	Firms with low skewness of their return	Kraus and Litzenberger (1976), Harvey	Harvey (2000)	We rank the markets by the skewness of their

(continued)

No.	Abbr.	Description	Stock-level key reference papers	Key references for evidence on country-level parallels	Calculation details
		distributions outperform firms with high skewness.	and Siddique (2000)		monthly return distributions in months $t - 24$ to $t - 1$. We go long (short) in the markets with low (high) skewness.
10	MaxRetMom	Stocks with a high maximum daily return in the previous month and low total return in the previous year underperform stocks with the low maximum daily return in the previous month and high total return in the past year.	Jacobs et al. (2015)	Zaremba (2016a)	We form portfolios based on an average position in two rankings: On the maximum daily return in month $t - 1$ and on cumulative return in months $t - 12$ to $t - 2$. We go long (short) in the markets with high (low) positions in the ranking, i.e., low (high) skewness, and low (high) maximum daily return.
<i>Group 4: Value</i>					
11	EP	Stocks of firms with low price-to-earnings ratios outperform firms with high price-to-earnings ratios.	Basu (1983)	Macedo (1995), Kim (2012), Angelidis and Tessaromatis (2014)	We rank the markets by their ratios of trailing four-quarter net profit to total stock market capitalization in month $t - 4$. We go long (short) in the markets with high (low) ratios.
12	DY	Stocks of firms with high dividend yields outperform firms with low dividend yields.	Litzenberg and Ramaswamy (1979)	Macedo (1995), Angelidis and Tessaromatis (2014)	We rank the markets by their dividend yield, calculated as the sum of all of the dividend paid in months $t - 12$ to $t - 1$, to the total

(continued)

No.	Abbr.	Description	Stock-level key reference papers	Key references for evidence on country-level parallels	Calculation details
					stock market capitalization in month $t - 1$. We go long (short) in the markets with high (low) yield.
13	CFP	Stocks of firms with low price-to-cash flow ratios outperform firms with high price-to-cash flow ratios.	Lakonishok et al. (1994)	Macedo (1995), Angelidis and Tessaromatis (2014)	We rank the markets by their ratios of trailing four-quarter cash flow from operations to total stock market capitalization in month $t - 4$. We go long (short) in the markets with high (low) ratios.
14	EBEV	Firms with low EV-to-EBITDA ratios outperform firms with high EV-to-EBITDA ratios.	Loughran and Wellman (2012)	Zaremba (2016a)	We rank the markets by their ratios of trailing four-quarter EBITDA to the enterprise value (EV) of a stock market in month $t - 4$. We go long in (short) the markets with high (low) ratios.
15	EBP	Firms with low price-to-EBITDA ratios outperform firms with high price-to-EBITDA ratios.	Mesale (2008)	Zaremba (2016a)	We rank the markets by their ratios of trailing four-quarter EBITDA to total stock market capitalization in month $t - 4$. We go long (short) in the markets with high (low) ratios.

Note. The table provides detailed information about the anomalies examined in this study. *No.* is the running number used to identify the anomalies in the text, and *Abbr.* is the symbol of an anomaly utilized in the study

Source: Prepared by the author

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Earnings Quality and Market Efficiency: Evidence from Romanian Capital Market



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Abstract This chapter analyzes the role of the financial information quality in the streamlining of the Romanian capital market. The study is carried out at the level of the entities that are listed on the regulated section of the Bucharest Stock Exchange, the sample being created by excluding the entities with financial activities. The use of the accounting criteria for the evaluation of the accounting data quality, respectively, earnings quality, earnings smoothing, and earnings predictability has allowed the identification of a significant qualitative level of reports issued by the entities that are part of the chosen sample. By introducing, as control variables, of the specific of accounting standards based on which the financial statements were issued we once again confirmed the robustness of the reached results. The Romanian capital market is characterized by a low level of performance, a featured that is estimated through the Jensen index, as a result of the difference between the investors' expectations and accomplishments, regarding the yield of the owned titles. The tested determinist relationship between the indicators of the two informational dimensions (accounting and capital market) identifies a significant influence of the quality of the accounting on the efficiency level of the capital market.

Keywords Earnings predictability · Accruals quality · Earnings smoothing · Market efficiency

1 Introduction

The financial information reported by the economic entities represents a supporting element of the decision-making process taking place at the level of all the participants in the capital market activities. Both the investors and the institutions that lead

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and survey the stock exchange activities use the information provided by the companies' financial reports as a mean of calculating various indicators.

The quality of the information determines the relevance of the carried out analyses, with a direct influence on the evolution of the market's activity, respectively on their efficiency and stability degree. The estimation of the influence of the data quality that is provided by the accountability on the capital market's performance represents the objective of this chapter, requiring, to this extent, the use of some objective quantification criteria of the two dimensions of the determinist relationship.

In order to avoid some collinearity relations, this chapter uses, for the evaluation of the qualitative level of the financial information, only accounting criteria (exclusively based on the data in the financial statements), respectively the earnings predictability, accruals quality, and earnings smoothing. From the various approaches regarding the estimation of the capital markets' efficiency degree, the chapter uses the Jensen index, as a result of the difference between the investors' expectations and accomplishments, regarding the yield of the owned titles.

The analysis of the relation between the two informational dimensions, the accountability and the capital market emphasizes a high qualitative level of the financial information issued by the Romanian listed companies, a low performance of the stock exchange and a significant influence of the accounting data quality on the efficiency of the capital transfer space. The chapter contributes to filling a gap in the literature. According to our knowledge, it is the first study that focuses on the role of accounting information in improving quality of the Romanian stock market.

The structure of the study consists of the presentation of the informational benchmarks, regarding the approached subjects, the presentation of the methodological demarche, and the interpretation of the reached results.

2 Literature Review

The interdependence relationship between the information that was reported by the economic entities and the activity of the financial markets is widely studied in the literature, following the different perspectives of the two-way relationship between these two dimensions. Thus, the quality of the informational benchmarks provided by the accountability contributes to the correct informing of the investors, completing the informational set that is needed by the preceding analyses required by a certain behavior on the market. In opposite, the maturity degree and implicitly the efficiency degree of the capital markets represent a standard that requires, through specific mechanisms, a high level of the financial information quality that has been issued by the listed entities.

2.1 The Quality of the Information and the Efficiency of Financial Markets

The efficient functioning of financial markets is decisively conditioned by the quality of the information issued by the entities toward their external users. The categories of users who are directly linked to the financial market are represented by investors (actual and possible ones) and creditors (Dicu 2015). Pressures made by the capital market have determined the societies to increase the financial reporting transparency in order to attract capital providers and so to reduce the cost of financing. In this circumstance, the objective of financial statements is to provide useful information for the investments' and crediting decision-making processes, known as "fair presentation" in the USA, "true and fair view" in the UK or "accurate image" in continental Europe (Toma 2012a).

Generally, the standardization organizations consider that, in order to reach the accurate representation of the reality in the company, one must strictly apply the accounting regulations, alongside the sincerity of the financial information producer. There was, therefore, an obligation related to the means used—regularity—and a moral obligation—sincerity (Burlaud 2013). The regularity consists of meeting the standards, the principles, the rules and procedures set by the accounting legislation, and also of the ones that are not found in those regulatory documents, resulting from the professional activities. The sincerity, in common language, is synonymous with authenticity, with the lack of tricks. This assumes the good faith application of the accounting regulations, depending on the knowledge the account responsible must have about the reality and the significance of the operations, the events and the situations in the entity, and on the other side, on the accountant's sincerity. The accounts of one entity are considered sincere if the assets, the liabilities, the owners' equity, the expenses, and the incomes have been correctly evaluated and if the risks have been objectively estimated. The accountant's sincerity regards the accounts' author's professionalism degree and his good faith (Toma 2012b).

The existing and possible investors are concerned about the inherent risk of the transactions and on their investments' profitableness. These users need information in order to decide if they should buy, keep, or sell their capital instruments (Istrate 2016). The stakeholders are also interested in the information that allows them to evaluate the entity's ability to pay dividends (Horomnea et al. 2016). Some have invested in order to gain dividends, to complete their incomes. But the priority distributions toward owners are equivalent to a low investment activity. On the contrary, others have invested to gain long-term added value. This asks for a priority benefit distributions toward investments and a lower distribution toward the stakeholders. Added value is specific to a growing entity, to an expanding market, to a strong competitive position and, why not, to a certain degree of risk.

2.2 *Accounting Criteria for the Estimation of the Financial Information Quality*

Accounting standards are only extended to the description of the qualitative features that the financial information must meet in order to be useful to. The realities of the capital markets have determined the conceptualization and the use of certain quantification mechanisms of the accounting data qualitative level.

This way, by relating both to the basic qualitative features (the relevance and the faithful representation), and to the amplifying ones (the timeliness, the verifiability, the intelligibility, and the comparability), concepts are presented in the literature, that capture the estimation process of the qualitative level of the information.

The quantification methods of the financial information quality mainly follow two activity directions. By widely using the information in the financial statements (especially the results' features), quality can be estimated through methods that pursue the magnitude and the quality of the accruals, earnings persistence, earnings predictability, and earnings smoothing. The relation with the financial market, namely the share price, is used as a benchmark for the estimation of the quality of the data provided by the accounting in methods such as the value relevance, the earnings timeliness, and earnings conservatism (Zhai and Wang 2016), the pertinence of the last ones being though influenced by the efficiency degree of the capital transfer space.

Taken from the relevance specific features, the predictable feature of the financial information provides sustainability to the predictability calculations made within the investment process. For the financial information to gain a predictive value, it must have the feature of being used in the processes the users apply to predict future results (IASB 2015). Earnings predictability can be defined as the extent to which investors can anticipate the entities' future results based on the current results (Al-Dhamari and Ismail 2014), thus representing the results' ability to explain themselves. This method assumes strictly use of the accounting perspective, ignoring the influences that come from the outside of the accounting system (such as the ones of the capital market) and it represents an ideal complement, pursuing the estimation of the financial information quality, for the value relevance (Schiemann and Guenther 2013).

The magnitude and the quality of the accruals represent another dimension of the financial information quality analysis, from the strictly accounting perspective, which focuses on the identification of the possible earnings management activities through the accounting procedures that are specific to the accrual accounting. The significant level of the accruals reflects the estimation of some future cash flows, this situation favoring the presence of earnings management activities. The manifestation of the earnings management lowers the results' quality, finally leading to a low predictability degree of them. Also, by modifying the results, managers can use earnings smoothing, this time in order to increase the entities' performance predictability (Dichev and Tang 2009), though modifying the quality of the reported financial information quality.

Earnings smoothing can be seen as a consequence of using the accrual accounting, whose basic principle is the removal of the effects generated by the gap between the cash transfer moment and its accounting registration and the development of a superior informational ability of the performance indicators, compared to the cash-flow-based ones. Though, the managers try to permanently smooth the cash-flow variations might lead to the lowering of the earnings' informational ability and timeliness (Dechow et al. 2010).

2.3 The Estimation of the Capital Markets' Efficiency Degree

Elaborated by Fama (1970), the hypothesis regarding the capital markets' efficiency has been widely debated in the literature. The main objective of the studies that have been developed from this subject is represented by the identification of the influence factors and the estimation of their contribution to the markets' performance degree. Various efforts made for this have led to a segmentation of the efficiency degree in the capital markets' activity.

Thus, a low efficiency is generated when the actual share price only reflects the information that stands at the basis of the previous prices, while a mid-high efficiency is specific to the situation when the actual prices are based on the simultaneous action of the previous prices and all the public information, including the information in the financial situation. A high-efficiency degree of the financial market is reached when the prices are set based on the public information, private, or hidden information, respectively, when the investors are not allowed the access to under-evaluated titles (Rankin et al. 2012). On an efficient market, the traded titles' price reflects all the available information. No investor has an advantage in predicting the future benefits, due to the fact that there is no access to the information that is not already available to all (Kristoufek and Vosvrda 2013).

In this circumstance, the financial reporting of the economic entities plays an important role in the share price's establishment process. Financial reports display sets of signals regarding the performance of the entity, but not their transparency (namely the displaying of all the carried out activities, respectively, the high volume of information) is the one that ensures the market efficiency (Bianchi and Jehiel 2015), but the quality of the displayed data determines the congruence of predictions and realities, regarding the yield of the made investments.

The estimation of the efficiency level of the capital markets' activities represents a permanent concern in the literature. The methods used to estimate the efficiency of the capital markets' part of some approaches that pursue the comparisons between various stock market indicators that are not adjusted to the risk, namely by using some yield-based models and some models regarding its exposure to risk.

The entities' exposure to the capital markets' risks is included in most of the models used for the estimation of the investments process through the β (Beta component) regression coefficient, which estimates the changes (volatility) of the return resulted from the action of one entity compared to the evolution of the return

of the titles of the entities in the same field of activity (or the capital market). Specific risks are integrated with Beta by creating a relation between the evolutionary perspectives of the entity and the ones of the activity field, the volatility of the owned shares' price reported to the ones in the field being the one that reflects the investors' perception about investments' efficiency possibilities.

Studies on the financial information quality identify, through a wide range of interpretations, the results that are issued by the entities as risk factors for the share prices' establishment (Dechow et al. 2010). When the financial information meets the quality requirements, the uncertainty volume decreases, leading to a lowering of Beta, respectively, to a lowering of the return gained by investors and to a decrease in the cost that the entity is to pay for the attracted capital. If the financial reporting provides clues that the investors' payment is to decreasing and is dependent of the market factors, by assuming a high level of risk, an increase in the volatility of the entities own share price compared to the average price of the field, an increase in the expected return of the investors, respectively, of the capital costs being reported alongside the increase of the Beta index (Johnstone 2016).

3 Hypotheses Development

The link between the quality of financial information and the reaction of the capital market is a complex demarche, because the specialized literature identifies a circular relationship between the two dimensions.

Considering the determinist relation between the quality of the data provided by the accounting and its effects on the efficiency of the capital market's activity, we need to use, as information quality estimation models, the methods that are strictly founded on accounting criteria (which only use data in the financial statements), in order to avoid some collinearity. The enhancement of the estimation process of the financial information quality demands the use of some control factors that are to identify the variations of the qualitative features under the influence of some variables that are associated with the entities' activity.

Thus, by using as disjunctive factor the dimension of the changes made on the earnings as a result of the auditors' recommendations, specific to the Chinese economic framework, Lennox et al. (2016) evaluate the earnings' quality using some criteria, such as earnings' smoothing, earnings persistence, and accruals quality. They have noticed an increase in the reported financial information quality resulting from the adjustments' intervention caused by the auditing process. The quality of the auditing process, from the auditing company's reputation perspective (Big4/Non-Big4) is involved by Hussainey (2009) in the analysis of the financial information predictability. To this extent, an increase in the results' quality is noted, in the case of the companies audited by the Big4.

The increase in the results' predictability is influenced, according to Dichev and Tang (2009), by the volatility of the financial information, the authors also identifying a series of errors made by analysts when studying the relation between the

predictability and the volatility of the results. AL-Dhamari and Ismail (2014) identify influence on the predictability of the reported results, of the free cash flow level, also appreciating the role of the corporate governance mechanisms' role in the mentioned relation. Thus, a high level of the free cash flow determines a decrease in the results' predictability, but the presence of some major institutional investors and of an independent chairperson softens the intensity of the relation. The quality of the financial information is seen by Zhai and Wang (2016) as a corporate governance mechanism. Studying the link between the efficiency of the capital usage and the quality of the results, the authors notice a direct dependence between the two variables, noticing the fact that an increase in the quality of the information leads to an optimization of the financial structure, which, in turn, completes and improves the functioning of the corporate governance.

Khalil and Simon's (2014) research, regarding the role of the contracting incentives and of the income smoothing (as a mean of earnings' management) in the explanation of the accounting choices, signals the fact that in the case of the emerging countries, the weaknesses regarding the financial reporting are caused by the poor enforcement of the law and the low protection of the minor investors. Also, they notice the need of estimating, by the institutional organizations, of an optimal flexibility level regarding the choosing of the accounting actions, in order to improve the quality of the financial information and to reduce the level of the earnings' management.

The need of evaluating the quality of the financial information is also supported by Tang et al. (2016), the authors emphasizing the growing significance of financial reporting on the international circulation of goods and cash flows, providing an estimation mean of its quality, by using a set of 6 indexes, founded based on data provided by the accounting and the audit, on a sample of 38 capital markets.

H1: The quality of the reported financial information, evaluated through accounting criteria, is significantly influenced by the specific of the accounting standards, respectively by the field of activity of the entities.

H2: The predictable ability of the results is influenced by the earnings' management degree (estimated through the income smoothing and the accruals' quality).

The literature marks the existing relation between the quality of the reported results and the investors' expected yield, a relation that depends on the capital market's conditions where the capital transfer process occurs. Sadka and Sadka (2009) notice the fact that at the level of companies, it can identify a positive link between the two dimensions, but, at an aggregate level, the correlation is poor. This situation is generated by the macro-economic conditions, and by the ones that are specific to the capital market, existing at the moment of the financial statements' issuance (including the market's risks, respectively the risk premium) (Zolotoy et al. 2017). Other macro-economic indicators such as economic growth (GDP growth) and economic development (GDP per capita) influence the companies' performance (Anton 2018), a relationship that gives them the ability to publish qualitative financial information. Public policy on taxation could be directly correlated with the efficiency and morality of accounting or auditing companies, due to the frequent

use of tax avoidance strategies (Afrăsinei and Georgescu 2015), respectively with the quality of the published financial information. The quality of the regulations is a determining factor of shadow economies, materialized in the lack of reporting the revenues generated by the operational activity, in order to avoid taxing (Iacobuta et al. 2014). For this reason, the level of taxation acts as an instrument that determines competition between states in an attempt to attract foreign investments (Afrăsinei et al. 2016), which can ultimately lead to the efficiency of capital markets.

Barnhart and Giannetti (2009) study the influence of the predictive ability of the listed companies' earnings, through the price-earnings ratio indicator, on the S&P 500 index, as an indicator of the capital market efficiency. From the grouping made depending on the nature of the result (positive/negative), it was noticed a higher ability of negative results to estimate future yields, compared to the positive results.

The way in which financial information influences the capital market is analyzed, at the level of the listed companies from the UK by Eliwa et al. (2016), through the association relation between the earnings' quality and the cost of the capital, as an index of the earnings' valorization by investors, through the traded shares' price. By using the financial crisis as criteria and by involving it, as a factor that generates additional risks to the market activity, in order to evaluate the accruals quality, earnings persistence, earnings predictability and earnings smoothness, the authors identify an increase in the role of the information quality in the decision-making process of investors, in the postcrisis period. Also, they mention an explanatory superiority, as a mean of estimation, of the earnings' predictability, followed by the accruals' quality, and, in the end, of the earnings' smoothing, signaling the fact that these elements might represent analysis data for the international normalizers. Besides, within the research on the contribution of the accounting standards' specific to the increase of the capital markets' performance, carried out on 31 emerging markets, Mhedhbi and Zeghal (2016) notice the positive effect of the implementation of the International Financial Reporting Standards (IFRS).

The role of the information provided by the accounting, through the methods regarding the evaluation (historical cost or market value) in the establishment of the market share list, respectively their contribution to the stability of the capital market is analyzed by Biondi (2015). The results reflect a significant influence on the markets' stability coming from the reported financial information when the historical cost is used, compared to the situation when the market value is being used as an evaluation basis, the last one being vulnerable to the market speculations.

At the level of 13 emerging markets, Song (2015) identifies a significant dependence of the risks associated to a listed entity, through the volatility level of the individual shares' price compared to the price on the market, on the complexity and transparency degree of the reporting system.

H3: The quality of the results reported by the listed companies significantly influences the efficiency degree of the Romanian capital market.

4 Research Design

The research pursues the testing of the mentioned hypotheses, in order to estimate the extent to which the quality of the financial information that is reported by the listed companies contributes to the increase of the Romanian capital market's performance. The demarche uses accounting criteria (strictly based on the information in the financial statements) designed to evaluate the earnings' quality, so as to avoid possible collinearity relations which might be generated when using the methods that are based on data from the both informational dimensions (the accountability and the market). From the quantitative perspective, the study mainly focused on the explanatory contribution of the (simple and multiple) regression analysis. In order to test the robustness of the reached results, we used, as control factors, the specific of the accounting standards (RAS, IFRS) and the field of activity (constructions, industry and trading, and services). Data collecting was made using the informatics SPSS 20.0 software.

4.1 Data, Population, and Sample

The analyzed population is represented by the companies listed on the regulated market of the BSE, the sample being created by excluding the entities with financial activities. The processed information was collected from the financial statements, respectively from the financial reports, that are specific to the Romanian capital market, available on the website of the BSE or from the websites of the entities. The period included in the study is 2010–2015, excluding the financial exercise in 2012 from the analysis due to the inherent difficulties regarding the financial reporting process, that are specific to the transition from the national standards to the IFRS. Three hundred and ten observations were made, regarding the financial and nonfinancial features of the 62 companies representing the analyzed sample.

4.2 Data Analysis Models

The study uses econometric models that are well-known in the literature, chosen depending of their representativeness for the research section they are involved in, as well as depending on the possibility of using them in the Romanian economic environment.

4.2.1 Measures for Earnings' Quality

The estimation of the qualitative level of the financial information, only through the accounting criteria has determined the use, to this extent, of the accruals quality, earnings' smoothing, and earnings predictability as instruments. The evaluation of the accruals quality displays the extent to which earnings' management activities were made. The method represents an alternative procedure of evaluating the earnings' quality, which avoids the difficulties caused by the separation process of the two accruals' categories (nondiscretionary accruals and discretionary accruals) that are specific to the estimation process through the discretionary accruals magnitude.

Developed by Dechow and Dichev (2002), the econometric model, whose relation is presented in Eq. (1), links the variation of the working capital accruals to the operating cash flow (CFO) (past, present, and future ones).

$$\Delta WC_t = \alpha_0 + \alpha_1 CFO_{t-1} + \alpha_2 CFO_t + \alpha_3 CFO_{t+1} + \varepsilon \quad (1)$$

Working capital accruals are calculated Eq. (2) as the difference between the current assets change in year t (ΔCA_t) and the current liability changes in year t (ΔCL_t) and the changes of cash and cash equivalent changes in year t ($\Delta Cash_t$) combined with the change of short-term liability with interest in year t (ΔSTD_t) (Zhai and Wang 2016).

$$\Delta WC_t = \Delta CA_t - \Delta CL_t - \Delta Cash_t + \Delta STD_t \quad (2)$$

The accruals' quality is reflected through the size of the error variable (ε), a high value of it reflecting a low quality of the accruals, respectively of the financial information.

The earnings' smoothing evaluates the changes made by the managers between the accruals and the cash flows (thus modifying the size of the earnings) in order to continuously increase, though reducing the predictive capacity and timeliness of the financial information. Earnings' smoothing (*ErSmoot*) is quantified through the ratio between the standard deviation of the operating income and the one of the operating cash flow, both being denominated with the total of the net assets from the beginning of the year (Eliwa et al. 2016). A low level of the ratio confirms the quality of the financial information.

The earnings' predictability evaluates the capacity of the previous information to foresee future results. The autoregressive relation, presented in Eq. (3), describes the existing dependencies between the earnings' indicators from two consecutive financial exercises. Reporting the results to the total assets allows the study of the relation at the level of the ROA (return on assets). The standard deviation of the error factor $\sigma(\varepsilon)$ reflects the level of the earnings' predictability. Thus, a significant $\sigma(\varepsilon)$ shows a low quality of the financial information.

$$ROA_t = \beta_0 + \beta_1 ROA_{t-1} + \varepsilon \quad (3)$$

4.2.2 Market Efficiency Estimation

The efficiency of the capital market can be appreciated as the difference between the investors' (estimated) expected yield and the real performance of the investments (K). The Jensen index (J_{EF}), Eq. (4), quantifies the performance of the capital market by introducing, as an estimation model of the expected yields, of the capital asset pricing model (CAPM) (Chow et al. 2016; Er and Hushmat 2017).

$$J_{EF} = K - \text{ExpRet}_{\text{CAPM}} \quad (4)$$

where

$$\text{ExpRet}_{\text{CAPM}} = R_f + \beta(R_r - R_f) \quad (5)$$

The expected return of the investor ($\text{ExpRet}_{\text{CAPM}}$) can be generated by the intrinsic value of the capital that was invested in shares, quantified through the free risk rate (R_f), alongside a premium for the assumed risk [The Risk rate (R_r) – The Free Risk rate (R_f)] adjusted by the systemic risk index β . The Free Risk rate (R_f) is represented by the reference interest level of the NBR, and the Risk rate (R_r) is associated to the Bet index, which is specific to the Romanian capital market. The β coefficient, calculated at the level of an entity synthesizes the volatility of the share's price compared to the average performance of the market or the activity field.

The relation for the Jensen index (J_{EF}) becomes Eq. (6):

$$J_{EF} = K - R_f - \beta(R_r - R_f) \quad (6)$$

The low value (close to 0) of the Jensen index reflects a congruence between the investors' expectations and the market realities, connected to the investments' yield, respectively a high level of the efficiency corresponding to the capital transfer place.

4.2.3 The Influence of the Earnings' Quality on the Market Performance

To analyze the relation between the two economic perspectives, the quality of the financial information, evaluated through the earnings' predictability (ErPred) and the accruals quality (AccQual), and the performance of the Romanian capital market, we propose the following models:

$$J_{EF_i} = \delta_0 + \delta_1 \text{ErPred}_i + \delta_2 D_{\text{norm}_i} + \delta_3 \text{ErPred}_i \times D_{\text{norm}_i} + \varepsilon_i \quad (7)$$

$$J_{EF_i} = \gamma_0 + \gamma_1 \text{AccQual}_i + \gamma_2 D_{\text{norm}_i} + \gamma_3 \text{AccQual}_i \times D_{\text{norm}_i} + \varepsilon_i \quad (8)$$

$$J_{EF_i} = \theta_0 + \theta_1 \text{AccQual}_i + \theta_2 \text{ErPred}_i + \theta_3 D_{\text{norm}_i} + \varepsilon_i \quad (9)$$

where D_{norm} is a dummy variable that takes value 1 if the entity uses the IFRS and 0 if it uses the RAS.

5 Empirical Results

The description of the variables involved in the analysis of the influence of the financial information quality on the capital market performance is synthesized in Tables 1 and 2. It displayed the mean and the standard deviation, both at the level of the whole sample and at the level of the clusters developed depending on the specific

Table 1 Descriptive statistics of clusters developed according to accounting standards

Elements	No. obs.	Total sample		RAS period		IFR period	
	N	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
ΔWC	310	0.007	0.173	0.020	0.166	0.001	0.177
CFO	310	0.113	0.280	0.088	0.265	0.129	0.289
ROA	310	0.022	0.079	0.028	0.082	0.018	0.077
K	310	0.027	0.385	-0.03	0.336	0.066	0.411
ExpRet	310	0.083	0.351	0.147	0.205	0.040	0.416
J_{EF}	310	-0.07	0.483	-0.16	0.349	-0.01	0.549

Source: Own processing in SPSS 20.0

RAS Romanian accounting standards, IFRS International Financial Reporting Standards

Table 2 Descriptive statistics of clusters developed according to activity field

Elements	No. obs.	Total sample		Industry		Services		Constructions	
		Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
ΔWC	310	0.007	0.173	0.004	0.175	0.025	0.179	-0.01	0.086
CFO	310	0.113	0.280	0.102	0.279	0.110	0.281	0.231	0.259
ROA	310	0.022	0.079	0.022	0.084	0.027	0.063	-0.01	0.060
K	310	0.027	0.385	0.030	0.407	0.007	0.294	0.086	0.407
ExpRet	310	0.083	0.351	0.077	0.381	0.115	0.247	0.067	0.285
J_{EF}	310	-0.07	0.483	-0.06	0.495	-0.11	0.381	-0.10	0.636

Source: Own processing in SPSS 20.0

of the accounting standards, which lay on the basis of the financial statements (Romanian accounting standards—RAS/International Financial Reporting Standards—IFRS), respectively, the activity field of the entities representing the selected sample.

Though, on average, the variation of the current accruals (ΔWC) has a low value, we identify some differences within by reporting to the specific of the used accounting standards, namely the significant change in the RAS period (mean = 0.020), compared to the financial exercises when the IFRS were used (mean = 0.001). This fact might show a high incidence of the earnings' management activities through the accruals accounting.

Specific to the cash accounting, the CFO reflects the volume of the reimbursement within the operating activities, we have noticed, from the analysis, an increase of their level during the IFRS period (2013–2015), due to the intensification of the economic activity compared to the 2010–2011 period. The performance of the operating activities, reflected by the ROA, registers, on average, low levels ($ROA_{\text{total_sample}} = 2.2\%$), with minimal differences from a period to the other, respectively a low dispersion compared to the average ($\sigma = 0.079$). Though, depending on the field of activity, we notice a high level of the operating activity in the field of industry ($ROA = 8.4\%$), respectively trading and services ($ROA = 2.7\%$), compared to the entities in the field of constructions, which are inefficient ($ROA = -1\%$).

By comparing to the investment process, the level of the shares' yield, the one expected by the investors (ExpRet) and the one they actually reach (K), registers significant differences, the low confirmation level of the expectations reflecting the low efficiency (J_{EF}) of the Romanian capital market. Though, from the time perspective of applying the accounting standards, we can notice a high inefficiency of the capital market between 2010 and 2011 ($J_{EF} = 16\%$), respectively an improvement in the ratio between the investors' expectations and the accomplishments between 2013 and 2015 ($J_{EF} = 1\%$).

The estimation of the financial information quality, through the accruals quality is depicted in Table 3. Based on the approaching differences of the economic events' representation between the accruals and the cash accounting, the determinist relationship emphasizes the existing dependencies between the variations of the CFO (from the previous, present, and future financial exercise) and the current accruals. This way, through the values of the error variable (ϵ_i), a significant qualitative level of the financial information is confirmed, which is reported in the ($\epsilon_i = 1 - R^2$; $\epsilon_{\text{total_sample}} = 0.347$) BVB circumstance. Thus, all the tested econometric models (by using the whole volume of observations, respectively the level of the annual data) were significant from the statistical perspective ($SIG_{\text{model}} = 0.000$), and during the post-IFRS financial exercises, a qualitative increase has been noticed ($\epsilon_{2014} = 0.294$; $\epsilon_{2015} = 0.329$) compared to the RAS period ($\epsilon_{2010} = 0.495$; $\epsilon_{2011} = 0.628$).

The earnings' smoothing (EarnSmoot) can represent a mean used in order to manipulate the earnings. Such an action can be identified by comparing the dispersion degree of the earnings, as an expression of using the accruals' accounting, to the

Table 3 The regression equations parameters specific to the accruals quality

Dependent variables— Δ WC						
Independent variables	Total sample	2010	2011	2013	2014	2015
Intercept	-0.003	0.044**	-0.048**	-0.028**	0.003	-0.012
CFO_{t-1}	0.064*	-0.457***	-0.326***	-0.420***	-1.003***	0.320*
CFO_t	-0.773***	0.208***	0.388***	0.576***	1.040***	-0.961***
CFO_{t+1}	0.753***	0.220***	0.137	-0.024	-0.022	0.684***
No observations	310	62	62	62	62	62
R^2	0.653	0.505	0.372	0.505	0.706	0.671
SIG model	0.000	0.000	0.000	0.000	0.000	0.000

Note: Elements from Eq. (1). We use ***, **, and * to show statistical significance at the 1%, 5%, and 10% levels, respectively

Source: Own processing in SPSS 20.0

Table 4 The estimation of the earnings' smoothing

Elements	Total sample	2010	2011	2013	2014	2015
$\sigma(OI)$	0.079	0.085	0.079	0.082	0.089	0.056
$\sigma(CFO)$	0.280	0.237	0.279	0.265	0.294	0.304
$\sigma(OI)/\sigma(CFO)^a$	0.282	0.359	0.283	0.309	0.303	0.184

Source: Own processing in SPSS 20.0

^aEarnings smoothing = $\sigma(\text{operating income})/\sigma(\text{operating cash flow})$

dispersion of the CFO, as an effect of the reimbursement process (a benchmark of cash accounting).

The results in Table 4, both from the global and the evolutionary perspective, show a high level of the quality of the financial information reported by the BSE listed companies [the low value of the $\sigma(OI)/\sigma(CFO)$ ratio], with a qualitative increase registered during the last financial exercise ($\text{EarnSmooth}_{2010} = 0.184$).

The evaluation of the predictive capacity of financial information, made in the context of completing the classic estimation model Eq. (3) with independent variables that reflect the quality of accruals (AccQ), respectively the specific of the used accounting standards (D_{norm}), confirms the significant qualitative level of the reported results of the Romanian listed companies. The data in Table 5 reflects, for all the analyzed cases and through some significant statistical models ($\text{SIG}_{\text{max}} = 0.060$), a low level of residual dispersion [$\sigma(\varepsilon)$], which demonstrates the capacity of the previous results of predicting future information. The introduction of the IFRS contributes in a low degree to the increase of the financial information predictability.

The link between the financial information quality and the performance of the Romanian capital market is analyzed through some econometric models Eqs. (7–9), which estimate the single or joined influence of the qualitative indicators (accruals quality and earnings predictability) and of the specific of the accounting norms on

Table 5 The regression equations' parameters that are specific to earnings predictability

$ROA_t = \alpha_0 + \alpha_1 ROA_{t-1} + \varepsilon_t$							
Dependent variables	Independent variables						
	Intercept	$\alpha_1 ROA_{t-1}$	$\alpha_2 AccQ_t$	$\alpha_3 D_{norm,t}^a$	R^2	Sig.	$\sigma(\varepsilon)$
ROA_t	0.008**	0.608***			0.409	0.000	0.060
ROA_t	0.008**	0.625***	-0.123***		0.439	0.000	0.059
ROA_t	0.017	0.624***	-0.122***	-0.005	0.440	0.000	0.059

Source: Own processing in SPSS 20.0

^aThe qualitative D_{norm} variable takes value 1 if the entity uses the IFRS and 0 if it uses the RAS
 ***, **, and * show statistical significance at the 1%, 5%, and 10% levels, respectively

Table 6 The analysis of the link between the financial information quality and the efficiency of the capital market

Independent variables	Dependent variables— J_{EF}					
	P_1	P_2	P_3	P_4	P_5	P_6
Constant	-0.073***	-0.075***	-0.075***	-0.026	-0.028	-0.023
ErPred	1.315***		1.639***	1.637***	4.104***	
AccQual		0.485**	0.685***	0.693***		0.833
D_{norm}				-0.038	-0.035	-0.039
ErPred * D_{norm}					-2.206**	
AccQual * D_{norm}						-0.242
N	310	310	310	310	310	310
R^2	0.028	0.013	0.054	0.056	0.049	0.016
SIG model	0.003	0.046	0.000	0.001	0.002	0.195

Source: Own processing in SPSS 20.0

***, **, and * show statistical significance at the 1%, 5%, and 10% levels, respectively

the efficiency degree of the capital transfer space, synthesized through the Jensen index (J_{EF}). Data in Table 6 show that the financial information reported by the BSE listed companies contribute to the streamlining of the capital markets. The quality of the data provided by the accounting represents a criterion that determines their significant integration in the informational set that is used by the investors when making decisions. The existence and the intensity of the link between the two informational dimensions (accounting and the capital market) is confirmed by the features of the statistical indexes attached to every model. Thus, tested models are statistically significant ($SIG_{model} < 0.05$), excepting only the P_6 model, which is significant for a 19.5% risk.

The R^2 determination ration identifies an average contribution of maximum 5.6% of the financial information quality to the streamlining of the BSE activity. Consequently to the testing of the role of the accounting standards specific to this relation, we notice a low influence of the qualitative variables (RAS/IFRS), as the difference between the explanatory ability of the models. The regression coefficients attached to the D_{norm} dummy variable confirm the fact, showing that investors demand

information that meets the quality criteria, barely focusing on the accounting standards that stand at the base of the financial statements issuance.

6 Conclusions

The analysis of the extent to which the quality of the financial information reported by the entities contributes to the improvement of the capital market performance represents a demarche whose result can be useful both to the accounting regulatory organizations and to the ones that regulate and survey the activity of the stock exchange. The common objective of the two dimensions that generate financial information (the accounting and the capital market) is to provide efficient support to the investors' decision-making process.

This chapter, through the testing of the mentioned working hypotheses, estimates the qualitative level of the financial information reported by the Romanian companies listed on the main section of the BSE, also evaluating the dependencies between this feature and the efficiency of the capital market's activity. The use of accounting criteria for the evaluation of the accounting data quality, respectively earnings' management, earnings' smoothing, and earnings' predictability, has allowed the identification of a significant qualitative level of the reports that were published by the entities that represent the chosen sample. By introducing, as control variables, the specificity of the accounting standards based on which the financial statements were issued (RAS/IFRS), respectively the field of activity of the companies, we have confirmed the robustness of the reached results.

The efficiency of the Romanian capital market was evaluated through the Jensen index, as a result of the difference between the investors' expectations and accomplishments, regarding the yield of the owned titles. The identified low performance level is a feature of the capital markets from emerging economies, still a little vulnerable to various systemic shocks.

The quality of the financial information, evaluated through accounting criteria (in order to avoid some collinearity relations generated by the use of some market-based criteria, such as value relevance or earnings' timeliness) significantly influence the efficiency degree of the capital market. The conclusion drawn subsequently to the validation of H3 hypothesis again confirms the important role of financial information in the decision-making process and, at the same time, reflects the need of permanent improvement of the quality of the accounting data volume provided to investors.

The limits of this study are represented by the low dimension of the sample and the number of observations, including the short period of time that was analyzed (only 5 financial exercises). Also, the low number of control factors represents an element that reduces the enhancement and the amplitude of the study. The removal of these restrictions represents the main future research directions, pursuing the inclusion of data that is specific to other stock exchanges in the research, in order to carry out some international comparative analyses.

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Assessing the Risk Associated with Lease Certificates in the Turkish Capital Market



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Abstract The risk management is an important concept due to the volatility and the market risks. Investors want to know the level of risk while they are making investment decisions. To that end, this chapter aims at assessing the risk associated with the lease certificates (*Sukuk*) traded in the Turkish capital market on the basis of Value at Risk (VaR) and Conditional Value at Risk (CVaR) methods. In accordance with this purpose, the research investigates the emergence and development of the *Sukuk* market in Turkey and the lease certificates issued by the Ministry of Treasury and Finance. Values at risk were calculated using the aforementioned methods for one million Turkish Lira investments into the *Sukuk* portfolio at 1–10-day horizons and at a confidence interval of 99%. Consequently, the VaR amount, the minimum expected loss, is 444.8 Turkish Lira, which is approximately 0.044% of the investment on average during the sample holding period at the 99% confidence level. At the same confidence level and for the equivalent holding period, the CVaR proves a little higher risk percentage, which is 0.051% of loss or 518.8 Turkish Lira on average.

Keywords Sukuk · Lease certificates · Value at risk · Conditional value at risk · Capital market in Turkey

1 Introduction

In the Islamic region, the most important principle for banking and finance activities is the “interest-freeness.” The prohibition of interest paved the way for the development of a financial system and interest-free banking based on Islamic law, especially in Muslim countries. *Sukuk*, which are the most common products of Islamic finance, were issued for the first time in Malaysia in 1983 and began to be

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distributed in Turkey in 2010. *Sukuk* is the Arabic term for the financial certificate, but it carries the meaning of both certificate and instrument. In Turkey, the term refers to lease certificates. There is an underlying asset-backed security on the basis of *Sukuk*. That is, a certificate holder takes a share of the income derived from assets or rights in proportion to the certificate holder's investments. The income is derived from assets or rights that are compatible with the interest-free principle. In the world, the special purpose vehicles perform the issuance of *Sukuk* transactions while the asset lease companies run the operations in Turkey. These companies provide coordination between buyers and sellers.

Although *Sukuk* differs from bonds and bills, these products are often confused. They are all structured financial products, but they differ in many ways (Vishwanath and Azmi 2009; Ariff and Safari 2012; Ariff et al. 2013; Afshar 2013). The basic dissimilarities are as follows:

- Bonds bear debt obligations, whereas *Sukuk* implies the ownership of an asset or right.
- *Sukuk* is evaluated by estimating the value and earnings of underlying assets. By contrast, bonds are evaluated depending on their credit rates.
- *Sukuk* can accumulate worth incrementally when underlying assets also accumulate worth in an incremental fashion. Contrastingly, the benefits from bonds are related to interest rates, revealing engagement in *riba*, which is entirely prohibited in Islam.
- The sale of *Sukuk* indicates the sale of ownership, but the sale of bonds signifies the disposition of debt.
- *Sukuk* is stacked on the basis of assets or rights instead of debt obligations.

In short, bonds are debt certificates on which an issuer agrees to make periodical interest payments and to pay the principal at the maturity, whereas *Sukuk* is non-debt instrument and requires an underlying asset as the basis for the issuance. The report conducted by the International Islamic Financial Market in 2017 indicated that *Sukuk* issuance has increased to US\$88.3 billion globally—a rise of 44% from the previous year (International Islamic Financial Market 2017). However, issuance volumes in 2011, 2012, 2013, and 2014 were US\$93.57 billion, US\$137.60 billion, US\$135.87 billion, and US\$108.30 billion, respectively. From 2012 to 2015, volumes decreased by more than 50% (from US\$137.60 billion to US\$60.69 billion). This sudden decrease is an obvious reflection of fluctuation and volatility in the market. Volatility in volume will also cause fluctuations in related asset prices. As with many fields of finance, therefore, the *Sukuk* market regard to the risk management as an important concept in transactions because of the volatility and the market risks. Risk plays a significant role in investment decisions for the fund owners. Correspondingly, different methods of measuring risk have been developed, the most common of which is the value at risk (VaR) technique as the Basel Committee has recommended the banks to prefer the technique in order to determine the capital market requirement for market risk. In this respect, this study evaluates the risk associated with the *Sukuk*, which is a fairly new financial instrument traded in the Turkish capital market.

The rest of the chapter is structured as follows: Sect. 2 presents information about the *Sukuk* market in Turkey, and Sect. 3 provides a literature review. Section 4 describes the methodology and the calculation of values at risk for an equally weighted portfolio created from *Sukuk* contracts for a horizon of up to 10 days. Section 5 concludes the chapter.

2 Sukuk Market in Turkey

Financial institutions that are called Islamic banks or interest-free banks in the world are referred to as participation banks in Turkey. Participation banks, which operate in line with the interest-free principle, collect funds on the basis of profits and losses and allocate capital according to the partnership, trade, and leasing methods. Private financial institutions were established in 1985 in Turkey. These began to be called participation banks since 2005. They had a share of 1% in the sector until 2000 and achieved a share of 6% by the end of 2017 (Participation Banks Association of Turkey, 2017).

This growth in the funds has led the participation banks to seek alternative financial products to reduce the risks. Additionally, the importance and search of new financial instruments in the sector have risen in order to expand the product range and to increase the customer satisfaction. However, the most difficult field of the product development based on Islamic principles is the financial markets for the participation banks in the banking sector since the financial structure both in Turkey and in the world is established based on interest system.

With the launch of the legal infrastructure for the lease certificates in Turkey, the participation banks, as well as the Turkish state, have started issuing *Sukuk* certificates. The development and diversification of the *Sukuk* instruments are still continuing. The share of bank assets for *Sukuk* product is increasing and usage area is expanding considerably.

With the issuance of *Sukuk*, a new product has emerged for participation banks to invest their liquidity surpluses. In addition, this new financial instrument has a function that allows investors, especially from Asia, Europe, the Middle East and many countries of the world to make an investment in Turkish assets. Nevertheless, *Sukuk* issuance and secondary market volumes in Turkey are not satisfying yet. The Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) categorize the *Sukuk* certificates into six classes; Mudarabah, Musharakah, Murabaha, Salam, Istisna'a, and Ijarah (AAOIFI 2018). The Ijarah, generally called Lease Certificate in Turkish capital market, is the most commonly preferred *Sukuk* type in the world.

In this context, lease certificates are the financial securities complying with the interest-free principles. They are issued by the asset lease companies and their owners are entitled to take a share from the proceeds of that security. In banking terms, Ijarah is to lease an asset or property that an institution acquires it through either purchasing or obtained in a manner consistent with Islamic law in order to get

periodical rental income. *Ijarah* includes the leasing contracts of business and services as well as tangible and intangible assets. The sale-leaseback method is frequently used in this type of *Sukuk*'s construction. The originator—the main firm—sells the assets, which are subject of leasing to the special purpose vehicle company and then leases them back. The proceeds of the issued *Sukuk* certificates consist of the rent payments to the investors. The communiqué on lease certificates in Turkey clarifies this *Sukuk* structure.

The Board of Capital Markets published the first communiqué regarding the lease certificates in Turkey on April 1, 2010. Through the communiqué, it has become possible for financial institutions and companies in Turkey to issue *Sukuk* contracts both in domestic and on abroad. In January 2011, legal exemptions related to *Sukuk* similar to the conventional bonds were regulated. At the end of 2011, Kuveyt Turk Participation Bank realized the first *Sukuk* issuance under the new legislation. However, the *Sukuk* does not have a developed market because the regulations are not adequate, the sector is very new and unknown, the number of investors is low and the volume is not big enough. The Turkish state as an institutional investor entered the market in 2012 and started to issue *Sukuk* contracts. Thus, the sector has revived and other players started to enter the market. The asset lease companies of participation banks and other institutions, and the Treasury (the Ministry of Treasury and Finance) actively take part in the *Sukuk* market. The amounts of *Sukuk* certificates issued by years are presented in Table 1.

The *Sukuk* issuance has increased steadily since its introduction in Turkey. The momentum of *Sukuk* issuance especially those observed in the domestic market until 2016 proved that this instrument could be a complementary and substitutive alternative to the conventional bonds and loans for both the originators and the investors in Turkey. In 2010, the volume was only 153 million Turkish Lira but it increased to 15.6 billion Turkish Lira at the end of 2017.

The average maturity with Turkish Lira currency for the participation banks varies between 6 months and 1 year whereas this period could be 3–5 years for the foreign exchange transactions. Certificates issued by private companies have also short-term maturity, generally 1 year. On the other hand, *Sukuk* certificates issued by

Table 1 Sukuk issuance between the years 2010 and 2017 (Thousand Turkish Lira)

Years	Participation banks	Private sector	Public (Treasury)	Total
2010	153,000			153,000
2011	616,000			616,000
2012			4,302,483	4,302,483
2013	1,405,000	100,000	5,804,627	7,309,627
2014	4,031,000	100,000	5,393,784	9,524,784
2015	4,061,991	25,000	3,390,299	7,477,290
2016	5,944,614	75,000	9,151,257	15,170,870
2017	6,873,000	25,000	8,797,465	15,695,465
Total	23,084,605	325,000	36,839,914	60,249,519

Source: Participation Banks Association of Turkey, 2017

the Treasury have 2- or 5-year and 5- or 10-year tenors for the Turkish Lira and foreign currency denominated contracts, respectively.

3 Literature Review

The literature on *Sukuk* can be classified into three groups. The first group distinguishes between *Sukuk* and conventional bonds based on their properties, structure, and how the market views them as different investment alternatives. The second group of literature discusses the legal challenges and tries to provide solutions for the conflicts inherited in a *Sukuk* structure and its derivatives. The third group of literature investigates risks associated with *Sukuk* and its implications on the return performance.

Especially, *Sukuk* has been down in the global financial market scene since 2002, and many significant studies are discussing its features and structures. El-Gamal (1999) introduced the different courses of Islamic regulations that supervises the issuance and trade of state contracts in the open market operations. He recommended that the central banks should involve in the issuance process of financial instruments that all players will acknowledge.

The demand for *Sukuk* issuance significantly affect the Islamic types of long-term financial assets that can exercise a similar function as conventional and fixed-income securities like Treasury bills and bonds (Iqbal and Tsubota 2006). Similarly, Damak and Volland (2008) pointed out that *Sukuk* is not only issued in Muslim countries but also in several non-Muslim Asian and European countries in order to attract the Islamic capital market.

Wilson (2007) researched Islamic asset management including various instruments such as equity, commodities, and *Sukuk*. Jabeen and Javed (2007) examined the *Sukuk* characteristics and construction in the lights of profit and loss sharing concept. They concluded that *Sukuk* had the flexibility to shape the financial constraints and investment opportunities according to Islamic principles, as well as meeting the market demand and supply requirements. On the other hand, Usmani (2007) presented a study discussing fixed-income financial assets from the Islam perspective. In the study, the difficulty for the application of conventional methods was clarified in detail, and it was promoted that *Sukuk* could be an alternative financial asset with the introduction of its various types and issues.

Tariq and Dar (2007) and Zaidi (2009) analyzed the construction and risk perspective of *Sukuk* issuance. Zaidi (2009) reasoned that the risks inherited in the *Sukuk* were more extensive than the risk of traditional bonds because *Sukuk* includes not only credit risk but market risk as well as different risk factors like regulatory risk associated with the assets underlying *Sukuk* issuance. On the other hand, Tariq and Dar (2007) contributed to the *Sukuk* literature by introducing a unique type of derivatives that could help in the risk management and comply with Islamic principles. The general results of these studies accept the *Sukuk* as a competitive and accessible investment that provides diversification for the investors in the market.

Jobst et al. (2008) also addressed the conflict in Sharia'ah scholars' opinions and argued that despite this mismatch among the thoughts, the diversity had contributed to the global growth of Islamic financial instruments.

Cakir and Raei (2007) analyzed the impact of *Sukuk* on the cost and the risk structure of investment portfolios. They used the VaR method. Their sample markets include Malaysia, Pakistan, Qatar, and Bahrain. The study investigates whether the secondary market pattern of *Sukuk* and Eurobonds issued by the same entity were significantly different in order to get profit by diversifying the investment. The study findings showed that adding *Sukuk* contracts in the portfolio decreased the VaR substantially compared to a nondiversified strategy, which meant making investment solely in traditional debt instruments. Wilson (2008) provided an introduction of various *Sukuk* types from finance perspective. The study includes Murabaha, Ijara, and Musharakah *Sukuk* in Saudi Arabia and Malaysia. He examined and explained *Sukuk* pricing issues, and investigated the payment stability of the sovereign *Sukuk*, which the returns based on the gross domestic product rather than a fixed interest rate, inflows. Wilson added that the special purpose vehicles should be in order to issue and manage *Sukuk* successfully. He also noted that the quality instead of quantity advancements is required for the growth of *Sukuk* market.

Ab Majid et al. (2011) discussed the issue of *Sukuk* default. They observed the bankruptcy executions on the Malaysian capital market via three defaulted corporate *Sukuk* as a case study. They also investigated the implementation of *Sukuk* insolvency on the countries reputation and the protection of investors. A number of papers investigated the effect *Sukuk* imposes on the investment's performance in the different types of financial institutions. Said (2011) provided an interesting study that analyzes whether the use of *Sukuk* has affected the success of Islamic banks during the financial crisis or not. He worked out a regression analysis to test the sensitivity of *Sukuk* performance in Islamic banks. He concluded that *Sukuk* did not affect the sample banks' success. Mansor and Bhatti (2011) evaluated the performance of 128 Islamic and 350 conventional funds in Malaysia for the period 1996–2009 by using aggregate returns. They discovered that the Islamic portfolio provided slightly lower returns compared to the conventional.

Godlewski et al. (2011), and Ariff and Safari (2012) determined the discrepancies between *Sukuk* and traditional bonds. Godlewski et al. (2011) tested the market's reaction toward *Sukuk* issuance trying to illustrate the investor's behavior. They used a market-based approach on Malaysian capital market data to estimate abnormal returns around the event of issuing *Sukuk* and traditional bonds. According to their study results, the stock market was neutral regarding the announcements of conventional bonds issuance while it reacted negatively to the *Sukuk* issuing. Hafezian et al. (2015) estimated the VaR in *Sukuk* market by using Generalized AutoRegressive Conditional Heteroskedasticity (GARCH) models including exponential GARCH, Glosten–Jagannathan–Runkle GARCH, integrated GARCH and asymmetric power GARCH. The data in their study includes *Sukuk* assets issued by the Islamic Development Bank, Malaysia, and the United Arab Emirates. The analysis's findings showed that the forecasting power of the asymmetric models was more successful in predicting the VaR for asset valuation. Similarly, Anas et al. (2016) in their

study estimated the *Sukuk* market volatility using different methods such as symmetric and asymmetric GARCH models in order to predict the VaR of the assets.

Nasir and Farooq (2017) offered empirical demonstrations in order to prove the distinction between *Sukuk* securities and traditional bills and bonds in terms of risk approach. Their analysis covered a comparison of risk investigation between *Sukuk* and traditional bonds in Pakistan. The study including 15 *Sukuk* and 30 conventional securities deployed VaR approach by using delta normal model in order to measure the risk. The consequences showed the *Sukuk* certificates have steady returns. Also, they are less risky assets compared with traditional bonds.

When we have reviewed the studies about *Sukuk* in Turkey, they are fewer. Küçükçolak (2008) evaluated *Sukuk* in Turkish Capital Market. She considered *Sukuk* an important, Islamic financial instrument in order to attract the Gulf capital markets to Turkey and seen as a global investment tool. Tok (2009) investigated the feasibility of *Sukuk* implementation in Turkey and proposed that *Sukuk* model will be applied if the revenues of public assets could be securitized. Sevinç (2013) tried to determine the VaR differences between the Eurobonds issued by the Turkish Republic and selected *Sukuk* samples issued by Turkey, Bahrain, Indonesia, Malaysia, Qatar, and the United Arab Emirates. In the study, equal weighted portfolios consisting of *Sukuk* and Eurobonds had been created, risk values calculated and compared. It was found out that the VaR of the *Sukuk* portfolio was lower than the Eurobonds. In the study of the tax dimension in *Sukuk* transactions, Yakar et al. (2013) said that tax could make *Sukuk* an attractive investment. They stated that bestowing tax advantage would be beneficial in order to improve the *Sukuk* market and to attract funds from international markets to Turkey. Similarly, Yilmaz (2014) examined the varieties and taxation of *Sukuk* in Turkey.

Özcan and Elitaş (2015) defined *Sukuk*, the varieties, similarities with and differences from other financial instruments. They explained the differences between *Sukuk* and conventional bonds and reported the advantages of the *Sukuk* to the firms and investors who need funds. They also discussed and exemplified the taxation of *Sukuk* transactions in the lights of Turkish legislation. Echchabi et al. (2016) examined the potential effects of *Sukuk* applications on some economic indicators such as gross domestic product, fixed capital formation, and trading activities. The study covers the data of Brunei, China, France, Gambia, Germany, Indonesia, Kazakhstan, Malaysia, Pakistan, Singapore, Turkey, United Kingdom, and Gulf Cooperation Council countries. They used the Toda and Yamamoto Granger Non-Causality analysis in their study. The findings proved that the issuance of *Sukuk* securities affected the economic indicators only when the all sample countries were evaluated together.

The studies, brief summaries given above, and other researchers (Adıgüzel 2010; Uğurlu 2011; Aslan 2012; Konca 2011; Dede 2013; Özeroğlu 2014; Aktaş 2016; Ülev et al. 2017; Lahsasna et al. 2018) examine the structure and functioning of *Sukuk* instruments, their similarities and differences between conventional bonds together with taxation and legal aspects of the application. These studies also evaluate the development of the *Sukuk* market, its challenges, opportunities, and the actions to be taken for the sector improvement. On the other hand, when the

studies in Turkey are reviewed, any study that addresses the risk aspects of the *Sukuk* transaction has not been conducted yet. For this reason, this chapter aims to bridge the gap in the literature about the risk analysis of *Sukuk* in the Turkish market.

4 Data and Methodology

4.1 Data

The study aims to assess the market risk of a *Sukuk* portfolio by using the VaR and the CVaR approaches. It covers *Sukuk* certificates traded in Borsa Istanbul, the capital market of Turkey. The data are limited to certificates issued by the Treasury because historical price data for certificates not traded in Borsa Istanbul are not publicly available. These certificates are generally held during maturity in order to obtain coupon payments. Therefore, the sample was selected from certificates currently exchanged in the market for at least 1 year of trading days, so statistical tests could be run. The lease certificates trading in the market and fulfilling the above-mentioned circumstances as of mid-January 2018 are listed in Table 2.

The log returns of the securities are taken into consideration for the analysis. Log returns are easily formulated as $\ln(p_t/p_{t-1})$, where p_t and p_{t-1} show prices of the security at time t and time $t-1$, respectively. The descriptive statistics for the daily returns of the certificates are given in Table 3.

The sample includes six *Sukuk* certificates, each consisting of 355 daily observations. The returns are not normally distributed.

4.2 Methodology: Value at Risk and Conditional Value at Risk Approaches

The risk is defined as the likelihood of a reduction in economic benefit that could result from a monetary loss, an expense, or a deficiency of transaction. Factors such as volatility in the markets, the progress in information technology, the growth in

Table 2 Sample size

Certificate code	Issue date	Maturity date	Coupon rate
TP TRD130219T18	15.02.2017	13.02.2019	5.52
TP TRD140218T18	17.02.2016	14.02.2018	5.32
TP TRD140721T18	20.07.2016	14.07.2021	4.70
TP TRD211118T18	23.11.2016	21.11.2018	5.08
TP TRD220921T16	28.09.2016	22.09.2021	1.12
TP TRD260918T17	28.09.2016	26.09.2018	4.40

Source: Prepared by the author

Table 3 Descriptive statistics

	LC(1)	LC(2)	LC(3)	LC(4)	LC(5)	LC(6)
Mean	0.008%	0.013%	0.000%	-0.007%	0.026%	-0.002%
Median	0.030%	0.030%	0.028%	0.030%	0.029%	0.030%
Std. dev.	0.0032	0.0031	0.0038	0.0041	0.0027	0.0035
Skewness	-14.98	-15.22	-6.49	-11.99	-1.06	-11.79
Kurtosis	256.62	254.53	82.53	151.27	32.27	147.23
Jarque-Bera	910353.4	896039.9	90645.6	314901.4	12017.91	298139.3
Probability	0.000	0.000	0.000	0.000	0.000	0.000
Sum	0.026	0.042	-0.001	-0.022	0.088	-0.006
Sum Sq. dev.	0.003	0.003	0.005	0.006	0.002	0.004
Observations	335	335	335	335	335	335

Source: Prepared by the author
 LC denotes for the lease certificates listed in Table 2 respectively

transaction volume, the financial innovation, and the development of derivative instruments have greatly increased the importance of risk management. The models used in the risk management process are also developing and increasing as a result of the influence of these factors.

One of the most practical and notable methods used to measure the risk and quantify the level of financial risk is the VaR method, which can be defined as the monetary equivalent of the expected loss (Jorion 2006). The method measures the risk of loss that an investment may experience under the average market conditions in a given period of the time interval at a certain confidence level.

Basel-I regulations were first published in the area of risk management in 1988. In 1999, the Basel Committee established within the Bank for International Settlements (BIS) prepared a new draft with greater risk awareness. New capital arrangements were made at the end of 2001 and planned to implement them in 2004. Basel II decisions have been implemented since 2007. Basel III decisions were regulated to complement the shortcomings, which emerged in the 2008 global crisis, of Basel II. Basel III comprises the quantity and quality of the capital, expanding the scope of risk, increasing the risk weights, and the establishment of a non-risk-based leverage ratio in order to limit the liabilities of banks and to provide an international liquidity risk evaluation method.

The committee has advised many banks to use the VaR method in determining the capital requirement for market risk. Upon this recommendation, this method has become a standard way of measurement that expresses the risk only according to one value, based on statistical data for the securities or portfolios. The VaR approach, using statistical measurement techniques, comes to the foreground in risk management, because of its ease of implementation.

Together with these amendments and developments in risk assessments, the Banking Regulation and Supervision Agency of Turkey issued a communiqué suggesting that the banks use VaR method in the calculation of market risk in November 2006. The components for the calculation of VaR are the standard deviation of the data, in other words, the volatility, as well as the confidence level for the probability of loss, the time frame, and the amount of investment made in the portfolio or the security. In this context, VaR could simply be formulated as follows:

$$\text{VaR} = M \times z_{\alpha} \times \sigma \times \sqrt{t} \quad (1)$$

where

- M is the amount of investment, in other words, the initial portfolio value;
- z_{α} is the standardized one-sided z scores at a given confidence level;
- α is the standard normal deviation (e.g., 2.33 for the 99% confidence level);
- σ is the standard deviation of the portfolio or the asset; and
- t is the holding period in terms of days.

The method requires the portfolio risk and return. The return of the portfolio can be formulated as follows:

$$r_t^p = \sum_{i=1}^n W_i r_{i,t} \quad t = 0, 1, 2, 3 \dots T \tag{2}$$

where

- r_t^p return of the portfolio at t time;
- W_i weight of the security i in the portfolio; and
- $r_{i,t}$ return of the security i at t time.

The portfolio risk could be expressed by the multiplication of matrices. Accordingly, the variance is as follows:

$$\sigma_p^2 = [W_1 \ W_2 \ \dots \ W_N] \begin{bmatrix} \text{cov}(r_1, r_1) & \text{cov}(r_1, r_2) & \dots & \text{cov}(r_1, r_N) \\ \text{cov}(r_2, r_1) & \dots & \dots & \dots \\ \dots & \dots & \dots & \dots \\ \text{cov}(r_N, r_1) & \dots & \dots & \text{cov}(r_N, r_N) \end{bmatrix} \begin{bmatrix} W_1 \\ W_2 \\ \dots \\ W_N \end{bmatrix} \tag{3}$$

The Basel Committee set three important standards for the duration and the amount of data in the VaR calculation (Basel Committee on Banking Supervision 1996). These are as follows:

- Value at risk should be calculated daily.
- The holding period should be 10 working days.
- The number of historical observation periods should cover at least 1 year of work days.

In this regard, banks in Turkey should regard the confidence level as 99%, according to the guidelines of the Banking Regulation and Supervision Agency. The increase in the confidence level leads to a higher VaR result. That is to say, the higher the confidence level, the higher the VaR will be. The holding period should also be determined as 10 days, according to the related regulations.

On the other hand, the VaR model assumes that the asset returns are normally distributed and that the model only measures the distribution quantiles. But the model ignores the fat-tailed properties of the actual returns, and it may, therefore, underestimate extreme price behaviors and disregard significant information regarding the tails of primary distributions. Therefore, the estimation method of the VaR has problems in measuring extreme price movements (BIS 2000). This may cause misleading forecasts and, hence, improper portfolio management strategies and unforeseen financial losses. Artzner et al. (1997, 1999) suggested using the CVaR in order to ease these problems inherent in the VaR approach. This method considers the loss beyond the VaR level and it fulfills all the requirements for a coherent risk measure, including transitivity, subadditivity, positive homogeneity, and monotonicity.

Conditional value at risk is measured as a portfolio's VaR plus the probability-weighted average loss expected in excess of VaR. Let X be the h -day returns, so that

$\text{VaR}_{h,\alpha} = -x_{h,\alpha}$ where $P(X < x_{h,\alpha}) = \alpha$. Then, the CVaR, which is described as the percentage of a portfolio value, could be presented in Eq. (4).

$$\text{CVaR}_{h,\alpha}(X) = E(X|X < x_{h,\alpha}) = -\alpha^{-1} \int_{-\infty}^{x_{h,\alpha}} x f(x) dx \quad (4)$$

The $x f(x)$ should be integrated over x till 100 $(1 - \alpha)$ % h -day VaR to be able to drive CVaR for any continuous probability density function of $f(x)$. So, it could be found out that:

$$\text{CVaR}_{h,\alpha}(X) = \alpha^{-1} \varphi(\Phi^{-1}(\alpha)) \sigma_h - \mu_h \quad (5)$$

That is the CVaR in the normal linear VaR model for a random variable $X \tilde{N}(\mu_h, \sigma_h^2)$ over the h -day horizon, where $\varphi(z)$ represents the standard normal density function, and $\Phi^{-1}(\alpha)$ is the α quantile of the standard normal distribution. VaR is not the maximum but the minimum expected loss at a given confidence level. On the other hand, CVaR means that the expected loss exceeds the VaR. Conditional value at risk ensures that how much one may lose if the security price drops in trading (i.e., over the next h days) below a pre-calculated VaR.

4.3 Findings of the VaR and CVaR Calculations

This part reports the analysis results of the VaR and CVaR calculations for the *Sukuk* portfolio. First of all, according to the study objective an equal-weighted portfolio is created by use of sample certificates given in Table 2. Afterward, the VaR and CVaR of the portfolio have been calculated. It is assumed that TRY 1,000,000 (according to the *Capital Market Regulations, it is the minimum capital requirements to be accepted as a qualified investor*) is invested in the portfolio and the calculations are run up to 10 days based on this amount. The confidence level is 99% as advised by the Basel Committee. The portfolio mean and the standard deviation is 0.006% and 0.178%, respectively, according to the formulations given in Eqs. (2 and 3).

Table 4 shows the risk percentages and the possible loss amounts up to 10 days according to the VaR and CVaR methods.

The values in the “amount of possible loss” column are divided by the amount of investment in order to calculate the loss percentage. According to the above results, for instance, 1-day VaR is TRY 163.0, which equals to 0.016% of the investment laid in the portfolio. This percentage is 0.065, which consists of TRY 651.7 amount of loss for the 10-day VaR. Obviously, as the holding period increases the amount at risk will raise. The loss is TRY 444.8 (0.044%) on average in the VaR method. On the other hand, the risky amounts are higher in CVaR approach for all days. For instance, 1-day VaR amount is TRY 195.9 (0.020%) in the CVaR method. The average percentage of the VaR calculation is 0.051, which equals to TRY 518.8 in

Table 4 VaR and CVaR calculations

Days	VaR		CVaR	
	Amount of the possible loss (TRY)	% of the loss	Amount of the possible loss (TRY)	% of the loss
1-day	163.0	0.016	195.9	0.020
2-day	256.6	0.026	303.1	0.030
3-day	328.4	0.033	385.5	0.039
4-day	389.0	0.039	454.8	0.045
5-day	442.4	0.044	516.0	0.052
6-day	490.6	0.049	571.2	0.057
7-day	535.0	0.053	622.1	0.062
8-day	576.2	0.058	669.4	0.067
9-day	615.0	0.062	713.8	0.071
10-day	651.7	0.065	755.8	0.076

Source: Prepared by the author

Note: All calculations were done using the *R* project for statistical computing software

CVaR. In other words, the conclusions of the CVaR provide that one million amount of investment into the *Sukuk* portfolio may result in 0.051% loss or TRY 518.8. Although both methods' results are so close to each other, CVaR process ensures more comprehensive and reliable outcomes since the returns are not normally distributed.

As a result of the findings, the methods used in this study, which are preferred in similar researches, such as Cakir and Raei (2007), Hafezian et al. (2015), and Nasir and Farooq (2017), could be applied especially by the investors, the fund managers, and the banks to determine the market risks—specifically the downside risk of the financial instruments and make a decision among different investment alternatives. In addition, *Sukuk* asset in a portfolio could bring down market risk and could provide stable income above the government bonds as proposed by Ramasamy et al. (2011) and Godlewski et al. (2011).

5 Concluding Remarks

Sukuk named as lease certificates in Turkey is a security, which complies with interest-free financial principles and provides the owners to take a share of the income derived from the assets or rights in proportion to their investments.

Sukuk issuance has increased steadily since the introduction of these certificates in Turkey. The volume was only TRY 153 million in 2010, whereas it increased to almost TRY 16 billion at the end of 2017 while. This high increase both reveal that the *Sukuk* certificates could be an alternative to the traditional interest-bearing bonds and loans in Turkey and also attract the attention of domestic and international investors. On the other hand, the risk management is an important concept in *Sukuk*

transactions due to the volatility and the market factor risks. Additionally, investors want to know the level of risk while they are making investment decisions. To that end, the risk of an equal-weighted portfolio composed of the *Sukuk* certificates, which are a new product in the Turkish market, is investigated. This brief study informs and encourages the investors about the risk of *Sukuk* performances for the success and the sustainability of the issuance in Turkey.

In this context, the study evaluates the risk analysis of *Sukuk* certificates traded in Turkish capital market on the basis of VaR and CVaR approaches. Within the scope of analysis, lease certificates issued by the Treasury are assessed and the risk values are calculated for the range of 1–10 days at a 99% confidence level. As a conclusion, the VaR amount, which is the minimum expected loss, is TRY 444.8, which is approximately 0.044% on average of the investment for the 10 days holding period. At the same confidence level and for the equivalent holding period, the CVaR proves a little higher risk percentage, which is 0.051% of loss on average. In addition to these results, further researches, which they also include other financial assets, could be studied in order to compare the risks and to give all stakeholders like investors and policymakers insight into the development of the *Sukuk* market.

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A Tale of Two States: An Application of a Markov Switching Model to Anomaly Returns



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Abstract The time-varying profitability of equity anomalies calls for a useful tool to select the winning investment strategies from the loser investment strategies. We offer a new framework for dynamic asset allocation across the anomalies based on a Markov regime switching model. Using a sample of eleven equity anomalies from the US equity market from the years 1963 to 2016 we demonstrate the predictability of their performance. The anomalies forecasted to be profitable significantly outperform the remaining anomalies by 0.15–0.43% per month. The results are robust to many considerations.

Keywords Equity anomalies · Markov regime switching model · Asset allocation · Asset pricing · Return predictability · The cross-section of stock returns

1 Introduction

Finance literature has discovered a preponderance of different equity anomalies. Studies of Hou et al. (2017), Jacobs and Müller (2017), and Zaremba and Andreu (2018) have reviewed hundreds of various return predictive signals. Alas, the return regularities tend to be ruled by a sort of Murphy's law: once discovered, they usually disappear quite quickly (Dimson and Marsh 1999). The reason for this anomaly

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extinction is not clear. The possible explanations include investor learning (McLean and Pontiff 2016) improvement of market liquidity (Schwert 2003; Chordia et al. 2011), the time-varying price of risk (Zaremba 2016), and simple data snooping and false discoveries (Harvey and Liu 2017). Furthermore, in some instances, the unprofitable anomalies rose from ashes to deliver decent payoffs once again (Gulen et al. 2011; Avramov et al. 2016).

The decay and time-varying nature of equity anomalies pose a significant challenge to quantitative equity investors. This study aims to fill the gap and provide investors a useful decision-making tool to sort out the wheat anomalies from the chaff anomalies.

We offer an anomaly selection tool based on the Markov switching model. The Markov switching models for time-series assume that the returns are generated from more than one return distribution (regimes), each characterized by different parameters including the mean returns. Application of the Markov switching models enables to discriminate between the two regimes, estimate their parameters, and assess the probability of the particular regime in the next period. Translating these opportunities into the universe of equity anomalies, the regime switching models allow us to estimate the probability that in the next period a given anomaly will be profitable. In other words, it will enable us to predict, whether a cross-sectional pattern will still exist next month, or will evaporate by being arbitrated away.

To examine the applicability of the Markov switching model, we investigate a sample of the following eleven broadly acknowledged equity anomalies: net stock issues, composite equity issues, accruals, net operating assets, asset growth, investment assets ratio, distress risk, O-score, momentum, gross profitability, and return on assets. Using data from the US equity market for the years, 1963–2016, we applied the Markov regime switching model to predict whether a given anomaly will be profitable next month and with what probability. We form long-short portfolios, by going long (short) the anomalies anticipated to be profitable (unprofitable). Eventually, we evaluate the performance of the anomaly picking strategies with multifactor models.

The major findings of this study can be summarized as follows: We provide convincing evidence that the Markov switching model can be applied efficiently to predict anomaly performance. The anomalies anticipated to be profitable deliver significantly higher returns from the remaining anomalies, and long-short portfolios produce monthly returns of 0.15–0.43%, dependent on the model specification. This difference, in general, remains significant even after controlling for return drivers in the multifactor models. The top anomalies outperform even a benchmark portfolio equally weighing all of the anomalies in our sample. The results are robust to many considerations and subperiod analysis.

Our study contributes to the literature of forecasting the anomaly performance and tactical asset allocation across different investment strategies. We extend the array of tools and signals to predict anomaly performance including: long- and short-term momentum (Zaremba and Szyszka 2016; Avramov et al. 2017; Arnott et al. 2018), cross-sectional seasonality (Keloharju et al. 2016; Zaremba 2017) and value

spreads (Asness et al. 2000; Zaremba and Umutlu 2018). Also, we offer a new asset allocation tool that has not been considered to be tested in earlier studies.

The remainder of the chapter is structured as follows: Section 2 presents our sample of equity anomalies and concentrates on predicting anomaly performance with the Markov switching model; Section 3 presents the results of additional robustness checks; and Sect. 4 provides a conclusion of our study.

2 Equity Anomalies

To avoid any arbitrariness in the selection of our sample of anomalies, we replicate the strategies researched by Stambaugh and Yuan (2016). The sample of returns includes the following anomalies: (1) net stock issues (Fama and French 2008), (2) composite equity issues (Daniel and Titman 2006), (3) accruals (Sloan 1996), (4) net operating assets (Hirshleifer et al. 2004), (5) asset growth (Cooper et al. 2008), (6) investment assets ratio (Titman et al. 2004), (7) distress (Campbell et al. 2008), (8) O-score (Ohlson 1980), (9) momentum (Jegadeesh and Titman 1993), (10) gross profitability (Novy-Marx 2013), and (11) return on assets (Fama and French 2006). The sample of returns run from January 1963 to December 2016 resulting in 648 monthly observations. We use monthly anomaly payoffs sourced from the website of Yu Yuan.¹ Thus, our sample of returns is computed based on Stambaugh and Yuan (2016). In particular, the calculations are based on all of the ordinary common stocks from the US equity market (CRSP codes 10 and 11) after filtering out penny stocks. The portfolios for all of the anomalies are formed using a consistent procedure. First, all of the shares are ranked according to the anomaly's sorting variables. Second, long-short value-weighted portfolios are constructed by going long (short) the 10 (1) decile of stocks, with the long (short) leg in the decile of better performing stocks (according to previous academic evidence). Following the approach and motivation of Stambaugh et al. (2012), we evaluate the anomaly performance with the three-factor model of Fama and French (1993), incorporating market portfolio (MKT), small minus big (SMB) and high minus low (HML) risk factors.²

Table 1 reports the performance of the eleven individual anomaly portfolios. When the full study period is considered (Panel A of Table 1), the majority of the anomalies disclose positive returns and alphas that significantly depart from zero. However, an exception is noted: the abnormal returns from the three-factor model are relatively low (insignificant) in the case of accruals and gross profitability. The last column of Table 1 also reports the descriptive statistics of the benchmark

¹We are thankful to Yu Yuan for making this data available at <http://www.saif.sjtu.edu.cn/facultylist/yyuan/> (accessed on January 7, 2018).

²We are thankful to AQR for making the factor returns data available at <https://www.aqr.com/library/data-sets>

Table 1 Performance of individual anomaly portfolios

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	Combo
<i>Panel A: Full Period November 1983–December 2016</i>												
<i>R</i>	0.27 (1.36)	0.34* (1.75)	0.50*** (2.83)	0.70** (1.98)	0.29* (1.68)	0.35** (2.47)	1.03*** (3.13)	0.73*** (5.38)	0.26 (1.40)	0.64*** (2.88)	0.55*** (3.67)	0.52*** (4.75)
<i>Vol</i>	3.13	3.38	3.23	6.66	3.85	2.90	6.77	2.89	3.47	4.28	2.87	2.19
<i>SR</i>	0.30	0.35	0.54	0.36	0.26	0.42	0.53	0.88	0.26	0.52	0.66	0.82
$\alpha_{3,F}$	0.24 (1.48)	0.31* (1.71)	0.52*** (3.46)	0.69*** (3.23)	0.28 (1.47)	0.27* (1.96)	0.69** (2.09)	0.63*** (4.21)	0.25* (1.85)	0.61*** (3.16)	0.51*** (4.32)	0.46*** (7.21)
<i>MKT</i>	-0.24 (-1.44)	-0.94*** (-2.99)	-0.87*** (-5.33)	-2.78*** (-9.23)	-0.99*** (-5.14)	-0.94*** (-6.30)	-2.90*** (-8.29)	-0.56*** (-3.04)	-0.39* (-1.70)	-1.22*** (-5.08)	-1.12*** (-7.76)	-1.18*** (-15.70)
<i>SMB</i>	0.28 (1.38)	0.93*** (2.64)	0.79*** (4.24)	2.65*** (7.62)	0.94*** (4.20)	1.02*** (5.67)	3.27*** (7.55)	0.69*** (3.03)	0.38 (1.42)	1.19*** (4.28)	1.13*** (6.75)	1.21*** (14.32)
<i>HML</i>	-0.16 (-1.55)	0.29*** (3.60)	-0.17* (-1.67)	0.25 (1.37)	0.28*** (2.75)	0.30*** (4.21)	0.87*** (2.90)	0.09 (0.96)	-0.58*** (-6.89)	-0.32* (-1.95)	-0.02 (-0.26)	0.08** (2.13)
<i>Panel B: Subperiod November 1983–May 2000</i>												
<i>R</i>	0.63*** (2.63)	0.24 (0.93)	0.48** (2.26)	0.60 (1.55)	0.31 (1.24)	0.43** (2.30)	1.48*** (3.72)	0.80*** (3.96)	0.56** (2.15)	0.78*** (2.73)	0.53*** (2.94)	0.62*** (5.09)
<i>Vol</i>	3.12	3.18	3.02	4.75	3.43	2.77	5.72	3.02	3.54	3.76	2.50	1.71
<i>SR</i>	0.70	0.26	0.55	0.44	0.31	0.54	0.90	0.92	0.55	0.72	0.73	1.26
$\alpha_{3,F}$	0.78*** (4.00)	0.55** (2.54)	0.62*** (3.08)	0.95*** (2.99)	0.41 (1.32)	0.67*** (3.70)	1.69*** (4.80)	0.86*** (3.79)	0.42** (2.14)	0.64*** (2.46)	0.62*** (3.51)	0.75*** (12.65)
<i>Panel C: Subperiod June 2000–December 2016</i>												
<i>R</i>	-0.08 (-0.45)	0.43* (1.80)	0.52* (1.95)	0.81 (1.40)	0.27 (0.92)	0.27 (1.59)	0.58 (1.25)	0.67*** (3.66)	-0.05 (-0.21)	0.49 (1.59)	0.57** (2.55)	0.41** (2.25)
<i>Vol</i>	3.12	3.57	3.44	8.15	4.24	3.03	7.66	2.76	3.38	4.74	3.21	2.58

SR	-0.09	0.42	0.52	0.34	0.22	0.31	0.26	0.84	-0.05	0.36	0.62	0.55
$\alpha_{3,F}$	-0.09	0.07	0.32	0.33	-0.01	-0.08	-0.23	0.50**	0.04	0.27	0.26*	0.13**
	(-0.52)	(0.28)	(1.57)	(1.14)	(-0.05)	(-0.44)	(-0.51)	(2.51)	(0.22)	(1.47)	(1.81)	(2.27)

Source: Prepared by the author

Note: The table presents the descriptive statistics of monthly returns on the eleven anomaly portfolio in our sample: (1) accruals, (2) asset growth, (3) composite equity issues, (4) failure probability, (5) gross profitability, (6) investment-to-assets ratio, (7) momentum, (8) net operating assets, (9) Ohlson's O-score, (10) return on assets and (11) net stock issues. Combo is an equal-weighted portfolio of all of the eleven anomalies. R is the mean monthly return, Vol is the standard deviation of the monthly returns, and SR is the annualized Sharpe ratio. $\alpha_{3,F}$ is the alpha from the three-factor model of Fama and French (1993), and MKT , SMB , and HML are measures of exposure to the market, small-minus-big, and high-minus-low factors, respectively. R , Vol , and $\alpha_{3,F}$ are expressed in percentage. The numbers in brackets are bootstrap (for R) or Newey-West (for $\alpha_{3,F}$ and α_{β}) for adjusted t -statistics. The asterisks *, **, *** indicate values significantly different from zero at the 10%, 5%, and 1% levels, respectively

portfolio (Combo), which equally weighs all of the anomalies in the sample. The monthly return (alpha) amounts to 0.52% (0.46%) and significantly departs from zero. Thanks to remarkable benefits of diversification across eleven largely uncorrelated strategies, the standard deviation of returns equals only to 2.19% implying an annualized Sharpe ratio of 0.82.

The subperiod analysis in Panels B and C confirm the observations of McLean and Pontiff (2016) that the anomaly profitability has been declining. The mean monthly return on the benchmark portfolio decreases from 0.62% in the years 1983–2000 to 0.41% in the years 2000–2016 and the three-factor model alpha shrinks significantly from 0.75 to 0.13%. Only two of the ten strategies displaying significant alphas in the first subperiod (Panel B) produce them also in the latter subperiod (Panel C). Finally, the decline in profitability was not driven by only a handful of strategies; in fact, literally, each of them showed lower abnormal returns in years 2000–2016 when compared to the earlier period.

3 Predicting Returns with a Markov Switching Model

To capture the time-varying nature of the profitability of equity anomalies, we use a Markov switching model. Let $(R)_t \in \mathbb{N}$ denote returns on the anomaly portfolios. To account for the presence of potential autocorrelation in monthly returns, the meta-anomalies may be modeled as an AR(1) process:

$$R_t = \mu + bR_{t-1} + \varepsilon_t, \quad \varepsilon_t \sim N(0, \sigma). \quad (1)$$

The optimal lag is selected using the standard information criteria and is found to be one (1). The expected value of an AR(1) process is given by:

$$E(R_t) = \frac{\mu}{1-b}, \quad (2)$$

Furthermore, if the process is stationary, then $|b| < 1$. As stated earlier, our approach aims to account for the time-varying nature of expected returns on equity anomalies. Thus, to describe anomaly portfolio behavior, we apply an AR(1) Markov switching model as follows:

$$R_t = \mu_{(s_t)} + b_{(s_t)}R_{t-1} + \varepsilon_t \text{ and } \varepsilon_t \sim N(0, \sigma_{(s_t)}). \quad (3)$$

We allow coefficients associated with the expected value to switch between two different states, i.e., $s_t \in \{1, 2\}$. The observation of either regime 1 or 2 at time t depends on a realization of an unobservable Markov chain. Thus, s_t is conditioned on the following information set: $R_{t-1} = \{s_{t-1}, s_{t-2}, \dots\}$.

At any time where $\tau < t$, the regime that will prevail at time t is unknown. Following Hamilton (1990), we introduce the following notation for conditional probabilities:

$$\widehat{\xi}_{t|\tau} = [P(s_t = 1|R_t; \theta), P(s_t = 2|R_t)]^T. \tag{4}$$

We further assume that the transition probabilities from one regime to the other are defined as follows:

$$P_t = \begin{bmatrix} p_t^{11} & 1 - p_t^{11} \\ 1 - p_t^{22} & p_t^{22} \end{bmatrix}$$

where $p_t^{ij} = P(s_t = j | s_{t-1} = i)$. Also, we assume that the transition matrix is constant. The estimation of unknown model parameters is performed using maximum likelihood estimation. Let θ denote all parameters of the unknown model, and relevant log-likelihood function $\ell_c(\theta)$ has the following form:

$$\ell_c(\theta) = \sum_{t=1}^T \log \left(\sum_{j=1}^2 f_j(r_t) P(s_t = j | \mathcal{R}_{t-1}; \theta) \right),$$

where $f_j(r_t)$ is a density of returns in the j regime (when $s_t = j, j = 1, 2$).

To find the maximum of $\ell_c(\theta)$, we apply the Hamilton filter (Hamilton 1990). Let η_t denote a vector of densities governed by s_t at date t :

$$\eta_t = [f_1(r_t), f_2(r_t)]^T. \tag{5}$$

The optimal inference and forecast for each month, t , in the sample can then be found by iteration using the following equations:

$$\widehat{\xi}_{t|t} = \frac{\widehat{\xi}_{t|t-1} \odot \eta_t}{1^T (\widehat{\xi}_{t|t-1} \odot \eta_t)}, \tag{6}$$

$$\widehat{\xi}_{t+1|t} = P_t^T \widehat{\xi}_{t|t}. \tag{7}$$

where element-by-element multiplication is represented by \odot . The log-likelihood function, $\ell_c(\theta)$, now has the following form:

$$\ell_c(\theta) = \sum_{t=1}^T \log \left(1^T (\widehat{\xi}_{t|t-1} \odot \eta_t) \right). \tag{8}$$

On the basis of the AR(1) Markov switching model, we can obtain two regimes with different expected returns. This might correspond with periods of higher and lower, or even negative, the profitability of the equity anomalies. Thus, we use the model to forecast whether next month the anomaly will be profitable. Namely, we check whether the anomaly is expected to be in a regime when the estimated $\mu_{(s_i)}$ parameter is positive and significantly different from zero at the 1% level. For robustness, we use four different minimum levels of the forecasted probability of observation to fall under a specific regime: 0.5, 0.6, 0.7, and 0.8. In other words, we try to pick the strategies that will be profitable at the 1% level of significance with the probability of at least 0.5, 0.6, 0.7, or 0.8. Subsequently, we build two separate equal weighted portfolios of anomalies: (1) anomalies that include all strategies that are predicted to be significantly profitable in the next month, (2) anomalies that include all of the remaining strategies. We classify these portfolios as profitable (Prof) and unprofitable (Unprof). To investigate differences in the performance of these two portfolios, we also form a long-short portfolio (P-U) which is long (short) in the Prof (Unprof) anomalies.

The model requires a considerable amount of data to estimate the regimes accurately, and therefore, we start with the first 250 monthly observations as a model training sample to use it to predict the regime in month 251. For each month, months 251–648, we estimate our model using all observations available until the considered month. Thus, the training period is systematically extended to forecast up to the returns in the next month.

Finally, to compare the performance of these strategies with a benchmark portfolio that weighs the eleven meta-anomalies equally, besides the Fama-French three-factor model, we also evaluate them with an ad hoc single-factor benchmark model in which we regress the returns on our strategies on the benchmark portfolio:

$$R_t = \alpha_B + \beta_{\text{BEN}} \text{BEN}_t + \varepsilon_t, \quad (9)$$

where BEN_t is the return on the benchmark portfolio in month t , ε_t is the error term, and α_B and β_{BEN} are the model's estimated parameters.

Table 2 reports the performance of the portfolios of anomalies formed using the Markov switching model. Clearly, no matter what minimum level of probability is assumed—0.5, 0.6, 0.7, or 0.8—the Prof portfolios always outperform the Unprof portfolios. In other words, the Markov switching model can select better performing anomalies. The raw return on P-U portfolio, going long (short) the Prof (Unprof) strategies, is always positive and significant. The performance is generally better for the portfolios with high minimum probability threshold. Nonetheless, the raw returns (alphas) on the Prof portfolios range from 0.68 to 0.88% (0.56 to 0.75%), so in all of the cases, they are higher than those of the benchmark portfolio displayed in Table 1.

The investigation in Panel B of Table 2 formalizes this inference further, by regressing the strategy return on the benchmark portfolio. Notably, all of the Prof portfolios disclose positive and significant abnormal returns, and all of the Unprof

Table 2 Performance of portfolios of anomalies formed on predicted profitability

	50%-probability			60%-probability			70%-probability			80%-probability		
	Prof	Unprof	P-U	Prof	Unprof	P-U	Prof	Unprof	P-U	Prof	Unprof	P-U
<i>Panel A: Basic statistics</i>												
<i>R</i>	0.68*** (5.21)	0.45*** (3.21)	0.23* (1.77)	0.71*** (5.06)	0.47*** (3.47)	0.24* (1.79)	0.84*** (5.51)	0.44*** (3.32)	0.40** (2.55)	0.88*** (5.46)	0.44*** (3.53)	0.43*** (2.64)
<i>Vol</i>	2.59	2.67	2.53	2.78	2.61	2.65	3.10	2.54	2.93	3.27	2.44	3.04
<i>SR</i>	0.91	0.58	0.31	0.88	0.62	0.31	0.94	0.60	0.47	0.93	0.62	0.49
<i>Panel B: Benchmark model</i>												
α_B	0.20** (2.48)	-0.14** (-2.45)	0.34*** (2.66)	0.23** (2.35)	-0.11** (-2.02)	0.34** (2.41)	0.34*** (2.60)	-0.13** (-2.32)	0.47*** (2.76)	0.38*** (2.60)	-0.11** (-2.55)	0.49*** (2.74)
<i>BEN</i>	0.92*** (12.35)	1.13*** (16.79)	-0.21 (-1.54)	0.93*** (12.75)	1.12*** (19.44)	-0.19 (-1.49)	0.97*** (12.19)	1.10*** (19.80)	-0.13 (-0.99)	0.96*** (8.11)	1.07*** (24.48)	-0.11 (-0.70)
<i>Panel C: Three-factor model</i>												
α_{3F}	0.56*** (5.61)	0.43*** (5.78)	0.13 (1.14)	0.58*** (4.75)	0.44*** (5.88)	0.14 (1.13)	0.71*** (5.06)	0.40*** (5.33)	0.31* (1.92)	0.76*** (4.88)	0.40*** (5.31)	0.36** (2.13)
<i>MKT</i>	-1.27 (-11.17)	-1.21 (-12.18)	-0.05 (-0.35)	-1.28 (-9.53)	-1.22 (-12.56)	-0.06 (-0.35)	-1.32 (-8.77)	-1.22 (-12.37)	-0.11 (-0.59)	-1.32 (-6.20)	-1.21 (-13.60)	-0.12 (-0.48)
<i>SMB</i>	1.39*** (10.65)	1.17*** (10.82)	0.21 (1.23)	1.42*** (8.98)	1.20*** (11.49)	0.21 (1.14)	1.46*** (8.48)	1.21*** (11.43)	0.25 (1.24)	1.43*** (6.08)	1.21*** (12.38)	0.22 (0.83)
<i>HML</i>	0.15*** (3.04)	0.03 (0.66)	0.12* (1.65)	0.20*** (2.62)	0.03 (0.71)	0.17** (2.26)	0.22*** (2.74)	0.03 (0.66)	0.19** (2.12)	0.23*** (2.62)	0.04 (0.88)	0.19** (2.02)

Source: Prepared by the author

Note: This table reports the monthly returns on portfolios of anomalies reported in Table 1. Prof (Unprof) is an equal-weighted portfolio of anomalies that are predicted to be in a regime with a positive significant (insignificant) μ parameter in Eq. (3) with a probability of profitability of at least 50%, 60%, 70%, or 80% (as indicated in the first row). The required significance level for μ is 1%. P-U is a long-short portfolio that is long (short) in the Prof (Unprof) portfolios. The table also reports results for a benchmark portfolio that equal-weights all eleven anomaly portfolios. *R* is the mean monthly return, *Vol* is the standard deviation of the monthly returns, and *SR* is the annualized Sharpe ratio. α_{3F} and α_B are the alphas from the three-factor model of Fama and French (1993) and the one-factor ad hoc benchmark model, respectively. *MKT*, *SMB*, *HML*, *BEN* are measures of exposure to the market risk factor, small-minus-big factor, and high-minus-low factor, and benchmark portfolio, respectively. *R*, *Vol*, α_{3F} , and α_B are expressed in percentage. The numbers in brackets are bootstrap (for *R*) or Newey–West (for α_{3F} and α_B) for adjusted *t*-statistics. The asterisks *, **, *** indicate values significantly different from zero at the 10%, 5%, and 1% levels, respectively

portfolios disclose negative (and also significant) abnormal returns. Summing up, the Markov switching model can reliably predict the better performing strategies and allowing to build portfolios significantly outperforming a benchmark portfolio equally weighting all of the eleven anomalies, both on a raw and risk-adjusted basis.

4 Additional Robustness Tests

To assure the validity of our results, we also conduct a number of additional robustness tests. First, we replicate our calculation with the alternative level of required statistical significance of $\mu_{(s_i)}$; namely, instead of the 1% level, we replicate the computations assuming the required level of significance at 5%. Second, we split our full research period into two equal subperiods. Hence, we repeat the analysis within the periods November 1983–May 2000 and June 2000–December 2016. The results of these additional robustness checks are reported in Table 3.

Panel A of Table 3 shows the results using the alternative (5%) significance level for $\mu_{(s_i)}$. While the performance is slightly worse than for the 1% level, still the anomalies predicted to be profitable vividly outperform both the unprofitable ones and the equally weighted benchmark of anomalies as well. The alphas from the ad hoc benchmark model are positive and significant for all of the specifications, ranging from 0.13 to 0.26%. Again, the higher the probability threshold, the better the performance.

Interestingly, the effectiveness of our anomaly picking approach differs in the earlier (Panel B) and the latter (subperiod). Except for the model with the highest limit of probability, 0.8, the relative outperformance of the Prof portfolios over the Unprof portfolios seems lower in years 2000–2016 in comparison with the earlier years. The model works best for the high probability limit, where its performance does deteriorate significantly when measured, for example, with the raw return on the P-U portfolio.

Notably, the model works quite well even in those more difficult times, 2000–2016. For instance, in both subperiods, the three-factor model alphas on the Prof portfolios are always higher than for the benchmark portfolios. In general, the Prof portfolios in each of the specifications in both subperiods deliver higher raw returns, alphas, and Sharpe ratios than the Unprof portfolios, although the difference is in some cases relatively insignificant.

5 Concluding Remarks

In this study, we have examined an application of the Markov regime switching model to predict the performance of equity anomalies. We disclosed that this framework could be employed to successfully forecast anomaly payoffs: the

Table 3 Performance of portfolios of anomalies formed on predicted profitability—additional robustness checks

	50% probability			60% probability			70% probability			80% probability		
	Prof	Unprof	P-U	Prof	Unprof	P-U	Prof	Unprof	P-U	Prof	Unprof	P-U
<i>Panel A: Alternative significance level—5%</i>												
<i>R</i>	0.62*** (5.17)	0.47*** (3.14)	0.15 (1.32)	0.68*** (5.22)	0.49*** (3.59)	0.19* (1.68)	0.75*** (4.98)	0.45*** (3.45)	0.30** (2.11)	0.79*** (5.12)	0.46*** (3.64)	0.33** (2.25)
<i>Vol</i>	2.53	2.75	2.57	2.74	2.57	2.61	3.10	2.46	2.89	3.27	2.40	2.99
<i>SR</i>	0.85	0.59	0.20	0.86	0.66	0.25	0.84	0.63	0.36	0.84	0.66	0.38
α_B	0.13* (1.80)	-0.10 (-1.45)	0.23* (1.77)	0.18** (2.16)	-0.07 (-1.19)	0.25* (1.92)	0.23* (1.94)	-0.09* (-1.80)	0.32** (2.07)	0.26** (2.10)	-0.08* (-1.80)	0.33** (2.16)
α_{3F}	0.51*** (5.64)	0.45*** (4.93)	0.06 (0.47)	0.58*** (5.34)	0.45*** (5.56)	0.13 (0.97)	0.65*** (4.89)	0.40*** (5.23)	0.24* (1.75)	0.70*** (5.15)	0.41*** (5.22)	0.30* (1.86)
<i>Panel B: Subperiod November 1983–May 2000</i>												
<i>R</i>	0.87*** (4.34)	0.51*** (4.48)	0.35** (2.12)	0.94*** (4.34)	0.56*** (4.75)	0.38** (2.13)	1.06*** (4.65)	0.54*** (4.41)	0.52*** (2.62)	1.02*** (4.28)	0.56*** (4.67)	0.45** (2.17)
<i>Vol</i>	2.75	1.59	2.36	3.04	1.66	2.66	3.44	1.69	3.13	3.58	1.68	3.36
<i>SR</i>	1.10	1.11	0.51	1.07	1.17	0.49	1.07	1.11	0.58	0.99	1.15	0.46
α_B	0.08 (0.58)	-0.02 (-0.37)	0.10 (0.55)	0.15 (0.79)	-0.01 (-0.23)	0.16 (0.71)	0.27 (1.13)	-0.05 (-1.25)	0.32 (1.16)	0.28 (1.01)	-0.03 (-0.84)	0.31 (0.99)
α_{3F}	1.00*** (8.69)	0.63*** (8.46)	0.37*** (2.71)	1.08*** (5.98)	0.68*** (9.56)	0.40** (2.14)	1.19*** (5.80)	0.68*** (10.38)	0.51** (2.40)	1.16*** (5.28)	0.69*** (10.88)	0.47*** (2.01)
<i>Panel C: Subperiod June 2000–December 2016</i>												
<i>R</i>	0.49*** (2.85)	0.38 (1.60)	0.11 (0.58)	0.48*** (2.73)	0.37* (1.68)	0.11 (0.54)	0.61*** (3.28)	0.33 (1.51)	0.28 (1.50)	0.74*** (3.51)	0.33 (1.56)	0.41** (1.98)
<i>Vol</i>	2.41	3.43	2.69	2.47	3.29	2.63	2.71	3.17	2.72	2.94	3.02	2.71
<i>SR</i>	0.70	0.38	0.14	0.67	0.39	0.14	0.78	0.36	0.36	0.87	0.38	0.52
α_B	0.18* (1.80)	-0.14* (-1.45)	0.32** (1.77)	0.16* (2.16)	-0.12 (-1.19)	0.28* (1.92)	0.27** (1.94)	-0.15* (-1.80)	0.42** (2.07)	0.38** (2.10)	-0.13* (-1.80)	0.52** (2.16)

(continued)

Table 3 (continued)

	50% probability			60% probability			70% probability			80% probability		
	Prof	Unprof	P-U	Prof	Unprof	P-U	Prof	Unprof	P-U	Prof	Unprof	P-U
	(1.86)	(-1.79)	(1.98)	(1.66)	(-1.62)	(1.71)	(2.16)	(-1.77)	(2.17)	(2.53)	(-2.02)	(2.53)
$\alpha_{3,F}$	0.14	0.13	0.01	0.14	0.11	0.03	0.26*	0.07	0.19	0.38**	0.06	0.32
	(1.58)	(1.58)	(0.07)	(1.30)	(1.27)	(0.19)	(1.95)	(0.71)	(0.94)	(2.51)	(0.67)	(1.58)

Source: Prepared by the author

Note: This table reports the monthly returns on portfolios of anomalies reported in Table 1. Prof (Unprof) is an equal-weighted portfolio of anomalies that are predicted to be in a regime with a positive significant (insignificant) μ parameter in Eq. (3) with a probability of profitability of at least 50%, 60%, 70%, or 80% (as indicated in the first row). The required significance level for μ is 5% in Panel A and 1% in Panels B and C. Panels B and C presents the results for subperiods November 1983–May 2000 and June 2000–December 2016, respectively. P-U is a long-short portfolio that is long (short) in the Prof (Unprof) portfolios. R is the mean monthly return, Vol is the standard deviation of the monthly returns, and SR is the annualized Sharpe ratio. $\alpha_{3,F}$ and α_B are the alphas from the three-factor model of Fama and French (1993) and the one-factor ad hoc benchmark model, respectively. R , Vol, $\alpha_{3,F}$, and α_B are expressed in percentage. The numbers in brackets are bootstrap (for R) or Newey–West (for $\alpha_{3,F}$ and α_B) for adjusted t -statistics. The asterisks *, **, *** indicate values significantly different from zero at the 10%, 5%, and 1% levels, respectively

anomalies anticipated to be profitable significantly outperform the other anomalies. The results are robust to many considerations.

Our results bear implications for both academics and market participants. From the academic perspective, our study provides new insights into the predictability of anomaly returns. From the practitioner's standpoint, our framework can be directly applied to craft efficient tactical asset allocation strategies.

Future studies on the topics discussed in the chapter could concentrate on two particular issues: First, it could be interesting to see whether the model could also be applied to cross-sectional patterns in returns on other asset classes, like commodities or bonds; second, examine whether "feeding" the model with additionally external variables, like volatility or liquidity, could deliver further insights into predictability of anomaly returns.

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Influence of the Correlation Coefficient on the Risk of the Exchange Option



Ewa Dziawgo

Abstract The chapter illustrates the properties of the exchange option: the definition, construction, and functioning of instrument, instrument's construction, types options, payoff functions, the pricing model, the effect of the correlation coefficient on the option price and value parameters: delta, vega, and theta. These parameters are the very important risk measures. The analysis of the variation in the value of risk measures provides information on the impact of changes of specific factors on the option price. The objective of this chapter is analysis of the influence of a change in the value of correlation coefficient between the return rates of underlying instruments on the variation in the option's price and values of the risk measures. Many Polish firms running the businesses on Turkish and Romanian markets. So, the empirical research existed in this chapter are illustrated based on a simulation of valuations of currency exchange options of Turkish Lira (TRY) into Romanian Leu (RON).

Keywords Instruments of financial market · Option's risk · Measurement of risk

1 Introduction

The rise in the volatility of the market conditions results in the increased demand for new methods and financial instruments to provide the means for more effective risk management. There is an increase in diversity of derivatives in contemporary financial markets. Options belong to this group of instruments (Black and Scholes 1973; Hull 2012; Dziawgo 2010; Musiela and Rutkowski 2005).

Options have the asymmetry in the rights and obligations imposed on the parties of the transaction. In addition, option contracts give the leverage effect in transactions. So, they are a special financial instrument of the risk management. If options

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are used in an unprofessional way in the financial transactions, they can generate significant losses. Therefore, it is very important to consider the values of the risk measures when analyzing the option strategies. In the case of the option, the parameters delta, vega, and theta are more important measures in the risk management (Hull 2012; Dziawgo 2013a). They indicate an influence of the changes in a value of selected risk factor on the option's price.

Exchange options are the multifactor options in the category of exotic options. Exotic options assure an income structure different from the structure of the vanilla options (Qiang 1996; Zhang 2001; Dziawgo 2013b). These options are traded on the over-the-counter derivative markets. Multifactor options are based on two or more underlying instruments. Therefore, multifactor options seem to be particular financial instruments for companies running a business on several markets. These options can be used for comprehensive protection against various kinds of risk. In the case of multifactor options, while analyzing the risk, it is necessary to consider more factors than for standard options. An additional parameter to be considered in the pricing and the risk of these options is the correlation coefficient between the return rates of underlying instruments. At its expiry the exchange options give their holders a possibility to swap one underlying instrument for another.

The aim of the chapter is to present the properties of an exchange option: definition and instrument's structure, types options, payoff functions, pricing model, the effect of the correlation coefficient between the return rates of underlying instruments on the variation in the option's price and value parameters: delta, vega, and theta. The empirical analysis presented in this chapter was carried out based on a simulation of the pricing of currency exchange options of TRY/PLN into RON/PLN.

2 Payoff Function and Price of the Exchange Options

The holder of the exchange option of the instrument U_2 (the second underlying instrument) into U_1 (the first underlying instrument) as the right to swap the instrument U_2 into U_1 . At the expiration date, the buyer of this exchange option is entitled to pay for the instrument U_1 with the price of the instrument U_2 .

The payoff function of the exchange option of the underlying instrument U_2 into underlying instrument U_1 assumes this form (Zhang 2001):

$$W_{2/1}(T) = \max [K_1(T) - K_2(T); 0] \quad (1)$$

where:

$W_{2/1}$ —the payoff of the exchange option of the instrument U_2 into the instrument U_1 ,

$K_2(T)$ —the price of the instrument U_2 in time T ,

$K_1(T)$ —the price of the instrument U_1 in time T ,

T —the expiration date.

The value of the exchange option of the instrument U_2 into the instrument U_1 (Margrabe 1978; Vollert 2001) is:

$$C_{2/1}(t) = K_1(t)e^{-q_1(T-t)}N(d_1) - K_2(t)e^{-q_2(T-t)}N(d_2) \tag{2}$$

where:

$C_{2/1}(t)$ —the price of the exchange option of the instrument U_2 into the instrument U_1 in time $t, t \in [0; T]$,

q_1 —foreign interest rate for the instrument U_1 ,

q_2 —foreign interest rate for the instrument U_2 ,

$K_1(t)$ —price of the instrument U_1 in time t ,

$K_2(t)$ —price of the instrument U_2 in time t ,

σ_1 —volatility of instrument U_1 price,

σ_2 —volatility of underlying instrument U_2 price,

$N(d)$ —cumulative normal density function,

ρ —correlation coefficient between the returns of the two underlying instruments,

σ_a —aggregate volatility, $\sigma_a = \sqrt{\sigma_1^2 - 2\rho\sigma_1\sigma_2 + \sigma_2^2}$

$$d_2 = \frac{\ln\left(\frac{K_1(t)}{K_2(t)}\right) + (q_2 - q_1 - 0,5\sigma_a^2)(T - t)}{\sigma_a\sqrt{T - t}}$$

$$d_1 = d_2 + \sigma_a\sqrt{T - t}$$

T —expiration date.

From Eq. (2) follow that the correlation coefficient between the returns of the two underlying instruments is the additional factor affecting the price and the risk of the exchange option.

The research are concerned the impact of the underlying instrument’s price and the correlation coefficient between the prices of two underlying instruments (RON/PLN and TRY/PLN) on the price of exchange option (of TRY/PLN into RON/PLN). The maturity time is 6 months. The correlation coefficient is 0.468. The study was carried out for the period: January 10, 2018–March 12, 2018. The variation in the exchange option price is presented in Fig. 1. Table 1 depicts the impact of the value of correlation coefficient on the variation in the price analyzed options.

During the considered period, the exchange option was in-the-money (i.e., if the price of the first underlying instrument is higher than the price of the second underlying instrument) on the following dates: January 16, 2018–January 17, 2018, January 22, 2018, January 29, 2018–February 22, 2018, February 26, 2018–February 27, 2018, and March 02, 2018–March 12, 2018. In other cases, the considered option was out-of-the-money (i.e., if the price of the first underlying instrument is lower than the price of the second underlying instrument).

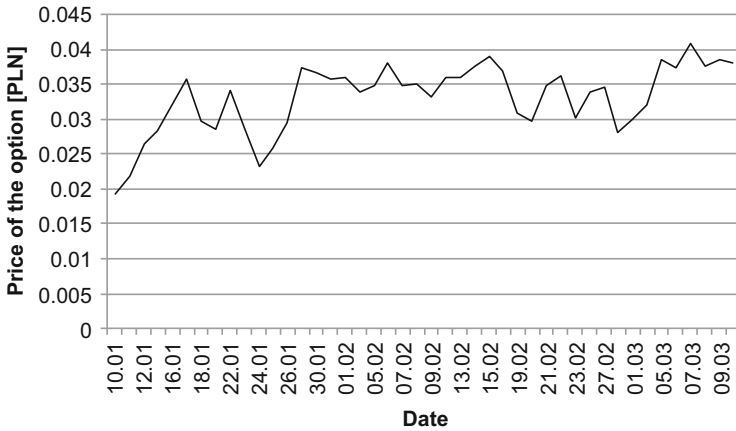


Fig. 1 Changes in the price of exchange option of TRY/PLN into RON/PLN. Source: Author’s calculations

Table 1 The impact of the correlation coefficient on the shaping of the price of exchange option of TRY/PLN into RON/PLN

Value of the correlation coefficient	Price option [PLN]	Value of the correlation coefficient	Price option [PLN]
-1.0	0.0581	0.0	0.0404
-0.8	0.0545	0.2	0.0368
-0.6	0.0510	0.4	0.0297
-0.4	0.0475	0.6	0.0194
-0.2	0.0439	0.8	0.0126
		1.0	0.0011

Source: Author’s calculations

A significant decrease in the price of the underlying instrument U_2 (TRY/PLN) was on the following periods: January 10, 2018–January 17, 2018, January 24, 2018–January 19, 2018, February 09, 2018–February 15, 2018, and February 28, 2018–March 05, 2018.

The following properties of the exchange option result from the analysis of the variation in the option prices:

- The increase/decrease in the difference between the price of the first and second underlying instruments affects the growth/decline in the price of the exchange option of the instrument U_2 into the instrument U_1 .
- When the value of the correlation coefficient is -1 , there is a largest price of the option (for the considered difference between the prices of the underlying instruments).
- The increase/decrease in the value of the correlation coefficient causes the decline/growth in the price of the option.

- In the case when the value of the correlation coefficient equals 1, with the difference between the price of the underlying instruments given, the option is the cheapest.

3 Sensitivity Measures of Exchange Option and Correlation Coefficient

Parameters delta, vega, and theta are the very important sensitivity measures of the option’s price. Since there are two underlying instruments for exchange options, therefore, in the analysis of the price sensitivity for their options it is necessary to consider more factors than in the case of the standard options (Dziawgo 2013b; Zhang 2001).

3.1 Delta Parameter

The delta parameter determines the changes in the option’s price, if the underlying instrument price changes by one unit (Hull 2012; Wilmott 1998).

Two delta parameters are calculated for the exchange option. The delta 1 parameter indicates the impact of the price of the first instrument on the price of the option, whereas the delta 2 parameter shows the influence of the price of the second instrument on the price of the option. The impact of the correlation coefficient on the shaping of the delta 1 and delta 2 parameters for discussed exchange option is presented in Table 2.

The delta 1 parameter exchange option is positive which means that the increase/decrease in the price of the first underlying instrument influences the growth/decline in the price of the exchange option of the instrument U_2 into U_1 . However, the delta

Table 2 The impact of the correlation coefficient on the shaping of the delta 1 and delta 2 parameters of exchange option of TRY/PLN into RON/PLN

Value of the correlation coefficient	Delta 1	Delta 2
-1.0	0.4854	-0.4093
-0.8	0.4814	-0.4072
-0.6	0.4736	-0.4055
-0.4	0.4697	-0.4025
-0.2	0.4618	-0.4016
0.0	0.4540	-0.3979
0.2	0.4461	-0.3941
0.4	0.4305	-0.3863
0.6	0.4074	-0.3752
0.8	0.3657	-0.3420
1.0	0.1382	-0.1332

Source: Author’s calculations

2 parameter exchange option takes negative values. In this case, the rise/drop in the second underlying instrument's price influences the decline/growth in the price of exchange option of instrument U_2 into U_1 . The greater absolute value of the delta parameter reflects the greater sensitivity of the price of the option to the change of the price of the underlying instrument. The increase/decrease in the value of the correlation coefficient influences the decrease/increase in the absolute value of the delta parameters.

3.2 Vega Parameter

Vega is the another measure of the option's sensitivity price. This parameter represents the change option's price in the reaction to the one unit change in the volatility of the underlying instrument's price. In the case of the exchange option is considered the influence of the volatility of each instrument and the aggregate volatility on the option price.

The vega 1 parameter shows the change in the option price if the volatility of the first instrument's price changes by one unit. However, the vega 2 parameter indicates the impact of the volatility price of the second instrument on the option's price. Table 3 illustrates the effect of the correlation coefficient on the values of the vega 1 and vega 2 parameters for the analyzed exchange option.

If the correlation coefficient is negative or zero, then the values of vega 1 and vega 2 parameters are always positive. This means that the increase/decrease in the volatility price of the underlying instruments impacts the rise/fall in the price of the exchange option. In other case, when value of the correlation coefficient is positive, then depending on the relation between the values of price volatility of the underlying instruments and on the value of correlation coefficient, one of the coefficients vega 1 or vega 2 may be negative. If the value of the vega parameter is

Table 3 The correlation coefficient on the shaping of the vega 1 and vega 2 parameters of exchange option of TRY/PLN into RON/PLN

Value of the correlation coefficient	Vega 1	Vega 2
-1	0.2503	0.2503
-0.8	0.2402	0.2342
-0.6	0.2296	0.2172
-0.4	0.2184	0.1986
-0.2	0.2068	0.1783
0	0.1945	0.1556
0.2	0.1816	0.1297
0.4	0.1679	0.0988
0.6	0.1541	0.0592
0.8	0.1422	-0.0039
1	0.1391	-0.1391

Source: Author's calculations

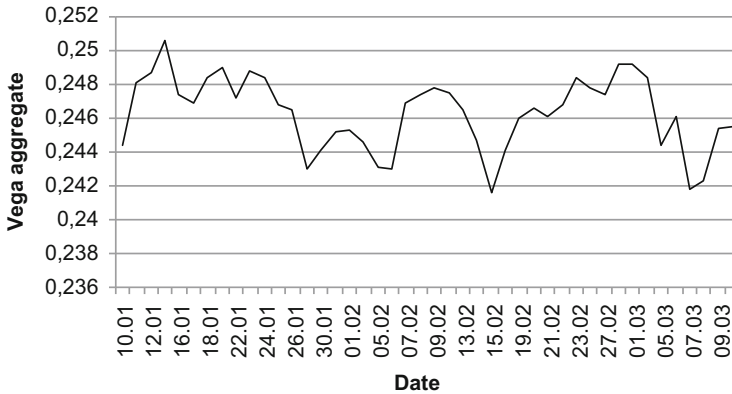


Fig. 2 Changes in the value of the vega aggregate of exchange option of TRY/PLN into RON/PLN. Source: Author’s calculations

negative, then the increase/decrease in the volatility price of the underlying instrument contributes the decline/growth in the price of the option.

The option with a higher absolute value of vega parameter have a greater sensitivity of the price of the option to fluctuations in the price volatility of the underlying instrument.

The increase/decrease in the value of the correlation coefficient affects the decrease/increase in the values of the vega 1 and vega 2 parameters.

In the case of exchange option, it is necessary to analyze the sensitivity of the option price with respect to the aggregate volatility. The vega aggregate (vega “a”) defines the change in the option price if the aggregate volatility changed by a unit. The analysis of Eq. (2) follows that:

- If the value of the correlation coefficient equals 1, then the aggregate volatility is $\sigma_a = |\sigma_1 - \sigma_2|$ and the option has the lowest value.
- When the value of the correlation coefficient is -1 , then the aggregate volatility equals $\sigma_a = |\sigma_1 + \sigma_2|$ and the option is characterized by the highest value.

Figure 2 shows the impact of the value of the correlation coefficient on the development of the value of the vega “a” parameter for analyzed exchange option. Table 4 shows the influence of the value of the correlation coefficient on the forming of the value of the vega “a” parameter for discussed exchange option.

If the difference between the price of the first and second underlying instrument increases/decreases, the value of the vega “a” parameter is fall/rise. The highest value of the vega “a” shows the greater sensitivity of the price of the option to the change of the aggregate volatility. Values of the vega “a” parameter are significantly volatile over time. This demonstrates a significant price sensitivity of exchange options to the change in the aggregate volatility. The vega “a” parameter takes always positive values, which means that increase/decrease in the aggregate volatility influences the growth/decline in the price of the exchange option. The increase/

Table 4 The impact of the correlation coefficient on the shaping of the value vega “a” parameter of exchange option of TRY/PLN into RON/PLN

Value of the correlation coefficient	Vega “a”	Value of the correlation coefficient	Vega “a”
-1.0	0.2503	0.0	0.2491
-0.8	0.2502	0.2	0.2483
-0.6	0.2501	0.4	0.2470
-0.4	0.2499	0.6	0.2443
-0.2	0.2496	0.8	0.2369
		1.0	0.1390

Source: Author’s calculations

Table 5 The correlation coefficient on the shaping of the theta parameter of exchange option of TRY/PLN into RON/PLN

Value of the correlation coefficient	Theta	Value of the correlation coefficient	Theta
-1.0	-0.0618	0.0	-0.0430
-0.8	-0.0585	0.2	-0.0380
-0.6	-0.0550	0.4	-0.0326
-0.4	-0.0513	0.6	-0.0262
-0.2	-0.0473	0.8	-0.0179
		1.0	-0.0030

Source: Author’s calculations

decrease in the value of the correlation coefficient has the effect on the decline/growth in the value of the vega “a” parameter.

3.3 *Theta Parameter*

The theta parameter is another measure of the option risk. This coefficient indicates the change in the option price as time elapses. Table 5 shows the impact of the correlation coefficient on the formation of the value of the theta parameter for discussed exchange option.

The theta parameter of the exchange options is negative, which indicates that the approach of the expiration date has decreased the price of the option. A high absolute value of theta parameter demonstrates a significant influence of length of the time to expiry on the option price. When the value of correlation coefficient increases/decreases, there is the fall/rise in the absolute value of the theta parameter. Therefore, the price of the exchange option with greater value of the correlation coefficient is less sensitive to the change in the expiry time.

4 Conclusion

The exchange options are based on two underlying instruments. The price of the exchange option depends on the price formation of two underlying instruments. The correlation coefficient is the another important factor affecting the price and risk of the exchange options. Therefore, in the analysis of the risk of the exchange options, it is very important to consider more factors than for the vanilla option.

The exchange option belongs to the multifactor class of exotic options. The multifactor options are advantageous in risk management because they can additionally protect against the risk of unfavorable change in the price of the several underlying instruments on the several markets. Considerable fluctuations in an option's price and value of the risk measures cause the growth attractiveness of exchange options in the group of speculative instruments.

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Part IV
Economics of Innovation

Evaluation of Creative Industries' Economic Impact in the EU Countries



Ugne Daubaraite and Grazina Startiene

Abstract For the last 20 years, creative industries (CI) have been experiencing increasing attention from both academia and policymakers alike. Capable of creating jobs, invigorating cities and regions, cultural and social life, contributing to the increase in value added, exports and quality of life, numerous researches proved CI to have impact on national economy. However, CI impact should not be limited to superficial analysis of static data. CI impact on national economy is best disclosed in comparison to other countries and the aim of this research is to analyse economic CI impact by running an empirical research in EU countries in 2008–2014 and taking into consideration CI impact on employment, added value and exports. We conclude there are three CI impact directions, namely economic, sociocultural, and environmental impact areas and verify that CI is an influential sector that holds impact on various areas of national economy.

Keywords Creative industries · Creative economy · Employment · Added value · Export · European Union

1 Introduction

Over the last decade, a growing number of states started to recognise the impact of creative industries (CI), and introduced a variety of CI promotion programmes. This tendency has given rise to more intensive theoretical and practical research into CI, accumulation of statistics and development of CI mapping, which reflects links amongst culture, CI and economic development. Richard Florida is one of the first researchers to comprehensively analyse CI and introduce the term “creative city” (Florida 2002). The founding idea of his work is that CI is capable of growing and becoming the driving force of domestic and regional economy. Majority of authors (Ratalewska 2018; Daubaraite and Startiene 2017; Tomczak and Stachowiak 2015;

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Cunningham and Potts 2014; UNESCO, UNDP 2013; De Propriis 2013; Sigurdardottir and Young 2011; Bandarin et al. 2011; Florida 2010; Hotho and Champion 2011; The Swedish Agency for Growth Policy Analysis 2009; Potts and Cunningham 2008; Sapsed et al. 2008; van der Pol 2007; KEA 2006; Blair et al. 2001, and others) stick to the opinion that by having capacity to promote the development of various economic sectors, CI are turning into a priority sector, which should be supported by national governments while aiming at the overall economic growth and international competitive advantage. As noted by Gibbon (2011), all businesses that originate from cultural peculiarities of a state or personal creativity of an entrepreneur make an important source for job and welfare creation. Hence, the impact of CI on national economy calls for comprehensive consideration.

The purpose of this research is to evaluate economic CI impact on national economy in comparison to other EU countries in 2008–2014. The main findings of this research are characterising the sector of CI by describing its peculiarities (“hourglass” structure, cyclical demand, innovation promotion); distinguishing the most important directions of CI impact on national economy (employment, added value, development of regions and cities, exports, social inclusion, social development, environmental protection and quality of life) and classifying directions of CI impact on national economy (economic, sociocultural and environmental impact areas). This chapter provides for a more consistent overview of relationship CI have with the national economy, furthermore, it serves as a starting point for further and deeper research into CI impact on national economy. Economic CI impact on national economy is best described by share of added value (most important), jobs and exports (least important) created in CI sector; EU countries are compared to each other based on economic CI impact, results are analysed and recommendations are proposed.

First section of this chapter describes the peculiarities of CI sector. Second section delves into analysis of impact CI have on national economy, describing the most important impact directions and classifying them into three main impact areas. Third section provides empirical analysis on economic CI impact through employment, value added and exports. The last section concludes the research and proposes directions for future research.

2 Peculiarities of the Creative Industries Sector

2.1 Structure of the CI Sector

The sector of CI consists of a large number of small enterprises, microenterprises and freelancers, while the number of medium-sized enterprises in the sector is comparatively small. Large CI enterprises occasionally operate only in the oldest and most mature subsectors. Some of the main subsectoral enterprises compete and possess big economic power (Ernst and Young 2014; Hotho and Champion 2011; Sigurdardottir and Young 2011; UNDP, UNCTAD 2010; UNCTAD 2008; Potts

and Cunningham 2008). Nevertheless, the largest share of the CI sector comprises small economic units (Tomczak and Stachowiak 2015; White et al. 2014; De Propris 2013; European Commission 2013), which are the driving force of CI. As the sector of CI covers a comparatively small number of large international corporations but leans on microenterprises and freelancers, it can be described by employing so-called “hourglass” model (Davies and Sigthorsson 2013). In some markets, for instance, in the UK’s market of software and computer games, advertisement, video art and cinema industries, microenterprises compete with international corporations. A similar situation can be observed in Australia and Hong Kong (UNDP, UNCTAD 2010).

2.2 Unpredictable Cyclical Demand

Since the sector of CI covers a large number of small economic units, the chances of each of these units to survive in the market directly depend on their ability to meet specific consumer needs. Taking into account small CI enterprises, it is worth noting that each of them can survive only by meeting the needs of a specific niche market. In many cases, CI enterprises that operate in the same subsector compete by such hard-to-measure and subjective features as work style, aesthetics, image attributes, etc. (Jones et al. 2004). Due to intensive competition, as well as the nature of products and services, CI differ from other economic sectors by their unstable and unpredictable demand (Hotho and Champion 2011; Malem, 2008; Potts et al. 2008; KEA 2006; Blair et al. 2001), and very sensitive reaction to market changes. The key determinant of unpredictability and uncertainty is production of services and goods in both B2B and B2C markets that *are not* the necessities (Thomassen 2007; Potts and Cunningham 2008). Under the pressure of unforeseen difficulties, business enterprises refuse advertisement services, while consumers save on non-necessities: cultural events, entertainment, artwork and the like. Hence, the impact of economic recession manifests itself in the sector of CI, in particular, as job losses (Blair et al. 2001). Analysis of scientific literature proposes that demand in the sector of CI is cyclical, and trade exceptionally in non-necessities makes this sector one of the first to signal about economic growth or recession.

2.3 One of the Main Innovation-Promoting Sectors

The findings of previous studies confirm that CI are turning into the main sector to promote technological and industrial innovation under the conditions of economic growth (European Commission 2010; UNESCO, UNDP 2013; European Commission 2013; Bettiol et al. 2012; Goede and Louisa 2012; De Propris 2013; Hotho and Champion 2011; Potts 2011; Sigurdardottir and Young 2011; Ashton 2011; Florida 2010; Power and Nielsen 2010; Malem 2008; Sapsed et al. 2008; Potts and

Cunningham 2008; Thomassen 2007; van der Pol 2007; Oakley 2004; Blair et al. 2001, and others), i.e. the ideas generated in CI transfer consumers' expectations to other economic sectors.

Summarising, it is important to note that although CI refer to an exceptional part of economy, they should be treated as a constituent of overall economy since they are affected by the same economic phenomena as other sectors. It is purposeful to research the impact of CI on national economy, at the same time considering the effects of the general economic conditions on CI formation and development.

3 Impact of Creative Industries on National Economy

CI make an important source of economic growth not only due to their role in job creation or expansion of the range of economic activities, but also due to their impact on public behaviour, social and institutional progress (Potts 2011). Given that the EU economy is dealing with the consequences of the economic crisis slower than it was predicted, the sector of CI shows faster pace of recovery (De Propris 2013; European Commission 2013). With reference to the report "Growth Prospects for SMEs are Encouraging" (European Commission 2013), vast majority of small and medium enterprises in the EU created more new workplaces and increased the share of the value added in GDP more than large enterprises between 2010 and 2013. Contribution of microenterprises, which, as previously mentioned, composed a substantial share of CI, is considered significant. In 2012, microenterprises employed nearly 86.8 million people, or 66.5% of the total EU labour force. With reference to the Ministry of Culture of Republic of Lithuania (2015), Lithuanian CI generate nearly 5.4% of the overall value added. What is more, CI employ about 4.92% of the total Lithuanian labour force.

Nevertheless, it should be noted that the growth of CI makes only insignificant positive impact on national economy in terms of foreign trade since CI are likely to develop in one state only (KEA 2006; Power and Nielsen 2010; Gibbon 2011; European Commission 2013). However, it can be observed that when an enterprise matures, its needs and opportunities to export products or services also increase. Results of the latest expert surveys revealed that distribution of CI products in foreign markets remains one of the most topical issues in Lithuania (Jančoras et al. 2014). This trend is partly determined by phenomenon of clustering, which is common in CI. Global impact of clustering is also recognised: megaregions of European CI are usually situated in one state or in the territories of different states with very similar history, and often cover neighbouring cities, which makes the clusters geographically defined (Florida et al. 2015).

De Propris (2013) emphasises the role of clusters in CI as well: her research disclosed that CI enterprises work together to gain from synergy effect, i.e. they exploit the opportunities to generate, share and develop new ideas. Hence, while operating in domestic or foreign markets, each enterprise in CI is able to meet consumer needs. Although it is often presumed that vast majority of CI enterprises

serve only small groups of consumers, i.e. meet the needs of the niche market, it should not be overlooked that large and very large enterprises, which have a significant impact on the economy of different states, may operate along with microenterprises in the sector of CI. According to Potts, Cunningham (2008), four theoretical models of CI impact on national economy can be suggested.

First, the Social support model is based on the presumption that CI can grow only on condition they get constant governmental support. Hence, the growth of CI has a negative impact on national economy because investment in other sectors would pay off in a shorter term than the support of CI.

Second, the Competition model, which is based on the presumption that CI should not be treated as either lagging or fast-growing sector that generates exceptionally high value added. This model proposes that CI should be treated as one out of many economic sectors, the development of which determines the general indicators of national economy. Growth of CI does not have any significant impact on national economy. Therefore, governmental support for this sector may payoff with the same efficiency as the support for any other sector. CI compete for governmental support with other economic sectors, and consumers can rationally exchange their products for more suitable alternatives regardless of moral or aesthetic characteristics of a product.

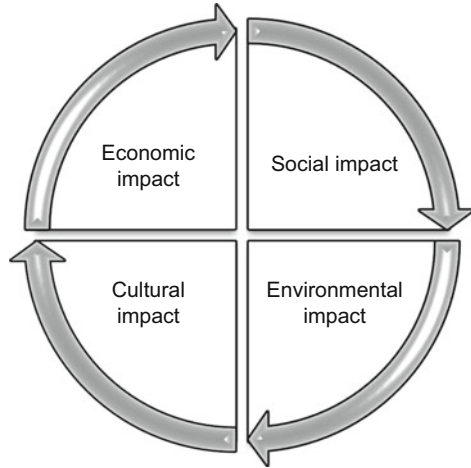
Third is the Growth model which is based on assumption that CI can be the engine of economic growth. This approach is based on the presumption that growth of CI has a positive impact on national economy because CI promote progress in other economic sectors. It is important to note that CI should not be treated as an exceptional economic sector. On the contrary, CI gain their importance due to their ability to promote the growth of other economic sectors.

Last one is the Innovation model which claims that CI should be considered as a part of the general innovation system in a state. This means that CI initiate and coordinate knowledge and innovation growth in national economy. Potts and Cunningham (2008) propose this hypothetical model, the empirical confirmation of which would show that CI make significant impact on national economy in general since all types of innovation (i.e. economic, social and cultural) originate from CI.

While analysing the cases of Australia (data for the period between 2000 and 2005), New Zealand (data for the period between 1996 and 2001), EU member states (data for the period between 1999 and 2003) and the UK (data for the period between 1997 and 2005), Potts and Cunningham (2008) proved that CI impacts national economy through the models of growth and innovation. However, the authors did not establish which model best describes the relations between the growth of CI and economic development. In any case, it was found that the growth of CI has a positive impact on national economy. The argument of a positive impact of CI national economy in general is supported by different UN organisations (UNESCO, UNCTAD, etc.) as well. According to the Creative Economy Report (UNESCO, UNDP 2013), the impact of CI manifests itself in four main areas (see Fig. 1).

Economic impact of CI on national economy manifests itself as growth of creative economy, reflected by such indicators as (UNESCO, UNDP 2013): increasing share of CI in total regional or national GDP, creation of jobs, attraction of

Fig. 1 Areas of CI impact on national economy.
 Source: Compiled by authors with reference to the UNESCO, UNDP (2013)



investment, increasing share of high-skilled labour force, growth of inbound tourism, income redistribution, reduction of poverty and social exclusion.

Social impact of CI on national economy manifests itself through social inclusion, intercultural dialogue, promotion of cultural identity, growth of social capital and protection of human rights. Other important criteria that allow assessing CI impact on national economy include improved availability of education and increase in public education, which, in turn, lays the foundation for social progress in the future (UNESCO, UNDP 2013). The earlier Creative Economy Report (UNDP, UNCTAD 2010) also categorised reduction of unemployment (i.e. creation of jobs) as a social manifestation of CI impact on national economy.

Cultural impact of CI on national economy manifests itself as a growing public interest and involvement in artistic and cultural events as well as increased consumption of artistic and cultural products.

Environmental impact of CI on national economy manifests itself via links between culture and environment, especially in terms of sustainable development. Public involvement in various activities promotes sustainable development, sharing of cultural values, traditional knowledge and the principles of natural resource management.

Literature analysis revealed that different authors focus on different characteristics of CI by emphasising the conditions and stages of their origin, formation and development. They also indicate different directions of CI impact on national economy, most important being the following: creation of jobs, added value, development of regions and cities, exports, social inclusion, social development, environmental protection, and quality of life.

Various reports demonstrate that CI contribute to unemployment reduction through promotion of self-employment in addition to new jobs in the CI sector. Literature analysis and research disclosed that CI promote GDP not only directly through creation of goods and services, but also indirectly through introduction and

popularisation of the new trends and needs, i.e. through so-called spillover effect. Creative economy does not exist without the concept of creative city, but in many cases researchers (for instance, White (2010)) analyse the potential of creative economy only peripherally. It must be noted that formation and development of CI promote economic and cultural development of a city or region, contribute to creation of a more attractive image and growth in living standards, generate other positive outcomes. CI impact on national economy through exports is not assessed unanimously; the argument that the current impact of CI on national economy through export is comparatively weak, but has the potential to grow, is the most common. Researchers emphasise that CI far more than other economic sectors contribute to social inclusion (reduction of social exclusion) by providing the freedom of self-expression and self-employment for each person regardless of their education, nationality or psychographic characteristics. Social development covers not only increase in diversification, but also the growth of social integration, openness to different cultures and customs, growth of tolerance. Environmental protection, i.e. sustainable development, saving of natural resources and compliance with regulations of environmental protection, manifests through public awareness and involvement in different sustainable development promoting activities, participation in environmental projects, etc. Quality of life manifests through availability of education, cultural events, the number of public spaces and restaurants in a city, safety, accessibility of the Internet and other communication networks.

According to UNESCO and UNDP (2013), the most significant directions of CI impact on national economy can be classified into four main groups (impact areas). Nevertheless, the above-discussed directions of CI impact on regional, urban and social development, and quality of life can be attributed to both the category of the social impact and the category of the cultural impact. Hence, it is purposeful to join these categories together. Classification of CI impact on national economy directions is presented in Table 1.

Summarising, it is important to note that the comprehensive research in scientific studies on the topic enabled the authors to identify the most significant directions of CI impact on national economy. Classification of different directions allows distinguishing three main areas of CI impact, namely economic, sociocultural and environmental. Identification of the most significant directions of CI impact on national economy enabled the authors to define the entire impact field, which can

Table 1 Classification of creative industries' impact on national economy directions

Economic impact of creative industries	Sociocultural impact of creative industries	Environmental impact of creative industries
Job creation	Regional and urban development	Environmental protection
Promotion of GDP and value added	Social development	
Exports	Quality of life	
	Social inclusion	

Source: Compiled by authors

be analysed in more detail within the framework of this research by dissociating the most significant directions from less significant ones.

4 Assessment of Creative Industries’ Economic Impact in the EU Countries Through Employment, Added Value and Exports

Research disclosed that creative industries’ impact on economy is usually described through research-specific indicators. Some of the best-known assessment indices are the Creativity index (Florida 2002), Global creativity index (Florida et al. 2015), EURO creativity index (Florida and Tinagli 2004) and Hong Kong creativity index (Hui et al. 2006). In order to evaluate EU countries by the economic impact creative industries have on national economy, assessment index is built on principal economic impact indicators. Importance of each indicator is determined through expert survey: experts evaluated the importance of each indicator on the scale from 1 to 5 (see Fig. 2 for details).

Research confirmed that creative industries’ economic impact is best expressed through creation of value added; it is crucial to note that as many as 62.5% of the surveyed experts affirmed value added to be the most important direction of creative industries’ economic impact, however, survey confirmed that exports are the least impacted by creative industries. Each of the impact directions is measured according to direction-specific indicators. Details on indicator measuring are provided in Table 2.

Economic impact of creative industries is assessed using the following equation:

$$E = w_1 \times DV_E + w_2 \times PV_E + w_3 \times E_E \tag{1}$$

where

E —index of economic creative industries’ impact on national economy,

DV_E —employment generated by creative industries,

PV_E —value added generated by creative industries,

E_E —exports generated by creative industries,

$w_1 \dots w_3$ —weights of index components, total amount of which equals one.

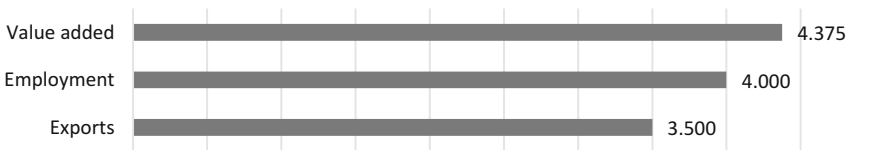


Fig. 2 Importance of creative industries’ economic impact indicators. Source: Compiled by the authors

Table 2 Indicators of creative industries' economic impact

Impact direction	Indicator	Indicator measurement
DV_E , employment generated by creative industries	Employment in creative industries, per cent of national employment	Number of employed in creative industries (number of persons)/total number of employed in the country (number of persons) \times 100
PV_E , value added generated by creative industries	Value added generated by creative industries, per cent of national value added	Value added generated by creative industries (million EUR)/national value added (million EUR) \times 100
E_E , exports generated by creative industries	Exports generated by creative industries, per cent of national exports	Exports generated by creative industries (million EUR)/national exports (million EUR) \times 100

Source: Compiled by authors

Table 3 Weights of economic impact index components

Impact direction	Weight of impact direction
DV_E , employment generated by creative industries	$w_1 = 0.337$
PV_E , value added generated by creative industries	$w_2 = 0.368$
E_E , exports generated by creative industries	$w_3 = 0.295$
Sum of weights of impact directions	$w_1 + w_2 + w_3 = 1$

On the grounds of expert survey results, the weight of each index component is determined (see Table 3).

Creative industries' economic impact on national economy in the EU countries is assessed in the period 2008–2014; in order to define economic impact, first the value of each impact direction is calculated. Statistical data for calculations is retrieved from EUROSTAT, however, it is very important to note that statistical data is provided in accordance to NACE rev. 2 (European Commission 2008), thus creative industries are defined by J, M and R classes that cover the following economic activities: J—information and communication; M—professional, scientific and technical activities and R—arts, entertainment and recreation.

4.1 Creative Industries' Impact Through Employment

First, numbers of employed in J, M and R classes of economic activities are calculated; then, this number is compared to the total national employment and creative industries' impact on employment is defined. According to the results of these calculations, EU countries are ranked: country with the highest creative employment is rated the highest score, and the country with the lowest creative employment is rated the lowest score. Average evaluation scores are provided in Fig. 3.

Obviously, paramount differences between the EU countries are visible in Fig. 3; subsequently, leading and following countries can be named. Impact of creative



Fig. 3 Distribution of EU countries according to average creative industries' impact through employment 2008–2014. Source: Compiled by authors

industries through employment is highest in the UK (average score in 2008–2014: $DV_E = 9.243$), Luxembourg (average $DV_E = 9.195$), Belgium (average $DV_E = 8.666$), the Netherlands (average $DV_E = 8.232$) and Sweden (average $DV_E = 8.184$). Lowest economic impact through employment is identified in Romania (average $DV_E = 0.337$), Portugal (average $DV_E = 0.674$), Bulgaria (average $DV_E = 0.867$), Poland (average $DV_E = 1.300$) and Lithuania (average $DV_E = 1.781$).

4.2 Creative Industries' Impact Through Value Added

First, the value added generated in J, M and R classes of economic activities is calculated, as this defines the value added generated in creative industries in a particular country. Next, the amount of value added generated in creative industries is compared to national value added, thus creative industries' impact through value added is defined. EU countries are ranked according to the creative industries' impact through value added and average score for the period 2008–2014 is calculated. Average scores are provided in Fig. 4.



Fig. 4 Distribution of EU countries according to average creative industries' impact through value added 2008–2014. Source: Compiled by authors

As seen in Fig. 4, economic impact of creative industries through value added is uneven and varies from country to country; however, this impact direction is expressed the most strongly in Malta (average score in 2008–2014: $PV_E = 10.304$), the UK (average $PV_E = 9.673$), the Netherlands (average $PV_E = 9.358$), France (average $PV_E = 9.253$) and Ireland (average $PV_E = 9.095$). Economic impact of creative industries through value added is the weakest in Lithuania (average $PV_E = 0.421$), Greece (average $PV_E = 1.472$), Portugal (average $PV_E = 1.525$), Poland (average $PV_E = 1.577$) and Bulgaria (average $PV_E = 1.840$).

4.3 Creative Industries' Impact Through Exports

It is very important to note that statistical data on exports is provided as ratio between national exports and national value added and is limited to J and M classes of economic activities. Furthermore, EUROSTAT provides data only for the period 2008–2011. In order to equally evaluate all the countries in 2008–2014, assumption is made that the creative industries' impact through exports holds the same values during the period 2011–2014. Nevertheless, countries are ranked according to the data available and EU countries are ranked according to the creative industries'



Fig. 5 Distribution of EU countries according to average creative industries' impact through exports 2008–2014. Source: Compiled by authors

impact through exports and average score is calculated. Average scores are provided in Fig. 5.

Even though creative industries' impact through exports is distributed more equally than in cases of employment and value added, leading and following countries can be named. Creative industries' impact through exports is the highest in Slovakia (average score in 2008–2014: $E_E = 4.720$), Malta (average $E_E = 4.636$), France (average $E_E = 4.383$), Romania (average $E_E = 4.130$) and Austria (average $E_E = 3.793$). Countries with the lowest creative industries impact through exports are Luxembourg (average $E_E = 0.084$), Cyprus (average $E_E = 0.590$), Bulgaria and the Netherlands (average $E_E = 0.632$) and Portugal (average $E_E = 1.011$).

4.4 Overall Creative Industries' Impact on National Economy

Evaluation of each impact direction provides grounds for measuring economic impact of creative industries in accordance to formula (1). Data is normalised using the logics of Global creativity index calculation: the value of economic impact index is divided by the number of countries in the research (28 EU member countries): yearly values provided in Table 4.

Table 4 Value of creative industries' economic impact index in 2008–2014

	2008	2009	2010	2011	2012	2013	2014	Average value
Austria	0.464	0.416	0.438	0.428	0.47	0.445	0.446	0.444
Belgium	0.709	0.673	0.697	0.689	0.71	0.697	0.685	0.694
Bulgaria	0.108	0.124	0.147	0.099	0.123	0.123	0.111	0.119
Cyprus	0.228	0.211	0.31	0.363	0.398	0.399	0.414	0.332
Croatia	0.39	0.341	0.342	0.271	0.269	0.256	0.231	0.300
Czech Republic	0.415	0.368	0.354	0.296	0.351	0.314	0.287	0.341
Denmark	0.588	0.538	0.523	0.52	0.534	0.535	0.51	0.535
Estonia	0.402	0.411	0.419	0.369	0.381	0.456	0.429	0.410
Finland	0.463	0.503	0.511	0.529	0.55	0.524	0.538	0.517
France	0.619	0.774	0.775	0.777	0.806	0.78	0.768	0.757
Germany	0.544	0.532	0.582	0.546	0.568	0.554	0.53	0.551
Greece	0.298	0.301	0.195	0.175	0.196	0.184	0.172	0.217
Hungary	0.334	0.334	0.322	0.31	0.297	0.346	0.321	0.323
Ireland	0.596	0.588	0.634	0.586	0.635	0.636	0.624	0.614
Italy	0.478	0.51	0.519	0.498	0.495	0.47	0.431	0.486
Latvia	0.294	0.249	0.296	0.3	0.308	0.319	0.331	0.300
Lithuania	0.073	0.139	0.126	0.149	0.192	0.168	0.156	0.143
Luxembourg	0.601	0.625	0.612	0.601	0.613	0.639	0.627	0.617
Malta	0.524	0.707	0.731	0.732	0.816	0.841	0.828	0.740
Netherlands	0.731	0.698	0.67	0.629	0.604	0.605	0.617	0.651
Poland	0.193	0.119	0.153	0.119	0.13	0.143	0.157	0.145
Portugal	0.123	0.12	0.132	0.121	0.119	0.106	0.082	0.115
Romania	0.186	0.173	0.188	0.23	0.249	0.315	0.341	0.240
Slovakia	0.33	0.426	0.386	0.362	0.439	0.426	0.402	0.396
Slovenia	0.53	0.515	0.554	0.58	0.609	0.62	0.609	0.574
Spain	0.371	0.346	0.379	0.368	0.392	0.367	0.318	0.363
Sweden	0.547	0.52	0.537	0.578	0.638	0.638	0.613	0.582
United Kingdom	0.824	0.805	0.808	0.787	0.827	0.814	0.802	0.810

Source: Compiled by authors

Theoretical range of the value of creative industries' economic impact index varies from 0 to 1; however, research revealed that the lowest value of creative industries' economic impact equals 0.073 (Lithuania 2008), and the highest value equals 0.841 (Malta 2013). In order to determine how the creative industries' economic impact shifted in the EU in 2008–2014, the change between index value in 2014 and 2008 is calculated (see Fig. 6).

Research revealed that the highest positive change took place in Lithuania (change in index value equals +113%) and Romania (+83%), while the highest decrease or negative change was observed in Greece (−42%) and Croatia (−41%). More detailed analysis of creative industries' economic impact of these countries is provided in Fig. 7.

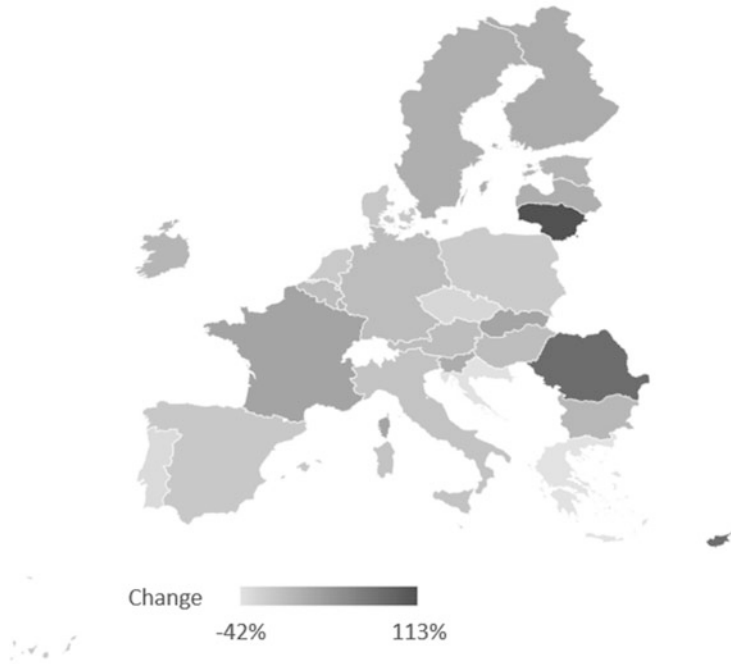


Fig. 6 Distribution of EU countries according to the change in creative industries' economic impact index values between 2014 and 2008. Source: Compiled by authors

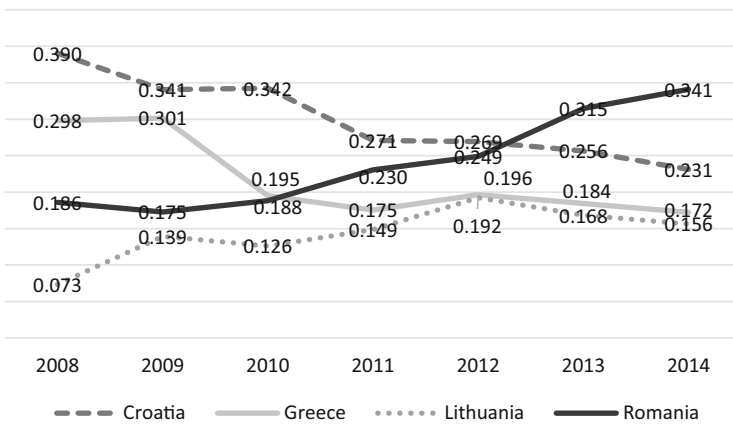


Fig. 7 Dynamics of creative industries' economic impact index value in Lithuania, Romania, Greece and Croatia in 2008–2014. Source: Compiled by authors

Shift of creative industries' economic impact in Lithuania was mostly determined by significant growth in creative employment: it rose from 6.28% in 2008 to 7.82% in 2014; special attention must be paid to 2013, as it was the year that boasted the

highest creative employment in the analysed period of time (7.98%). Shift in economic impact was also influenced by generation of value added, it increased from 10.72% (3147.6 million EUR) in 2008 to 11.26% (3706.4 million EUR) in 2014. Romania was exceptional in very high growth in value added. Creative industries contributed 12.4% (15,724.5 million EUR) of value added in 2008, and 16.42% (21,802 million EUR) in 2014. Creative employment maintained similar values throughout the analysed period, while creative industries' exports posed a modest growth. Index shift in Greece was strongly influenced by high decrease in value added: creative industries created 14.29% (30,545.5 million EUR) of Greece's value added in 2008, and only 12.57% (19,712.2 million EUR) in 2014. Creative employment in Greece showed modest increase: from 7.85% in 2008 to 8.37% in 2014; in addition to this, creative industries' exports grew throughout the analysed period.

Changes in economic creative industries' impact on Croatian economy were mainly influenced by decrease in value added: creative industries contributed 16.08% (6608.2 million EUR) in 2008 and 15.77% (5718.5 million EUR) in 2014. On the other hand, creative employment increased and constituted 6.72% in 2008 and 7.83% in 2014. It is important to note that creative industries' exports grew throughout the analysed period, but were not enough to compensate for the loss in added value.

To sum up, creative industries, economic activities that are built on personal creativity, have positive impact on national economy. Due to this, authors propose the following measures to strengthen the sector of creative industries: (1) foster entrepreneurship in the sector of creative industries in order to promote establishing new and expanding already existing creative industries' enterprises, which in turn generates new employment possibilities in the sector of creative industries; and (2) employ adequate financial measures that create new and innovative opportunities for creative industries to grow both internally and internationally.

5 Discussion and Conclusions

We ran a wide research, which allowed them to distinguish CI defining characteristics. In comparison to other sectors, CI can be described by their hourglass structure: wide population of micro-enterprises and freelancers, a small number of middle-sized enterprises, and influential corporations operating only in the most mature subsectors. As CI do not produce necessities, they face the problem of unstable and unpredictable demand. At the same time, CI can be treated as one of the first sectors to signal changes in economic cycles; the same holds true for growth (demand for CI products increases), stagnation or decline (demand for CI products decreases). Literature analysis disclosed that CI should be considered as one of the most important sectors to ignite changes in trends and promote innovations. Results of the latter characteristic are distributed over other sectors through spillover effect.

Literature analysis enabled authors to discover the main impact on national economy directions (employment, added value, regions and cities development, exports, social inclusion, social impact, environmental impact and quality of life). Authors classified impact directions into three main impact areas: economic impact of CI, sociocultural impact of CI and environmental impact of CI. This classification enables to look further into the complex relationship CI has with the national economy: basing on the findings of this research, authors are able to define indicators for each impact area and constitute an index to measure the impact CI has on national economy in different countries.

Authors propose creative industries' economic impact measurement index that contains evaluation of primary impact directions: employment, value added and exports generated in the sector of creative industries. Research on creative industries' economic impact in the EU-28 during the period 2008–2014 revealed that creative industries' economic impact was the highest in the UK and the lowest in Portugal throughout the whole analysed period.

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Disruptive Innovation and Dynamic Capabilities Approach: Sensing, Seizing, and Transforming



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Abstract Disruptive innovation (DI) has been widely discussed in academic and business environments. It has been defined as a product or process that changes the basis of competition, offering valuable attributes for emerging segments ignored by the mainstream market. On the one hand, DI requires the firm ability to identify and take advantage of the opportunities offered by new markets and new technologies in highly changing and volatile environments. On the other hand, dynamic capabilities portray the firm ability to achieve new and innovative ways of competitive advantage in highly volatile environments through integration, building, and reconfiguration of a set of internal and external competences. The process of disruptive innovation is related to the dynamic capabilities approach in its application and relevance to the context of disruption. They are addressed through an analytical–descriptive perspective. The literature review regarding both dimensions—dynamic capabilities and disruption theory—was analyzed by capturing foundations and characteristics in order to integrate them as a powerful way for disruption. The methodological tools used were disruptive innovation attributes, dynamic capabilities approaches and characteristics, and two dimensions: articulation and integration. All of them are qualitative. Based on the findings, it has been established that a powerful way to catalyze disruption is an iterative and no lineal process of: sensing—disruptive opportunities identification; seizing—deploying disruptive strategy; and transforming—organizational asset reconfiguration.

Keywords Disruptive innovation · Disruptive technologies · Dynamic capabilities · Organizational competences · Highly changing environments · Innovation

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1 Introduction

The term disruptive technologies was coined initially by Bower and Christensen (1995) in order to explain the impact of different kinds of technological innovations. Nevertheless, its definition was extended in a subsequent publication—further Christensen and Raynor (2003) used the term disruptive innovation in order to include not only technologies but also business models—making a great contribution to literature and impacting both the business world and the academic community (Assink et al. 2006; Yu and Hang 2010). Disruptive innovation (DI) has been researched in several ways such as demand-based view, development, and commercialization of technological innovation, measure of disruptiveness, identification of opportunities of disruption, business model, and so on (Christensen et al. 2015; Govindarajan et al. 2011; Guttentag 2015; Markides 2012).

As research has been addressed in managerial and strategic ways, it is necessary to understand how the process of disruption is influenced by dynamic capabilities to sense and seize opportunities offered by new markets and new technologies in highly changing and volatile environments (Assink 2006). Disruptive innovation has been defined as a process (Christensen et al. 2015) or as a result—innovations in product, service, and/or business model—(Markides 2006, 2012; Nagy et al. 2016) that changes the bases of competition and offers valuable attributes for emerging and ignored segments in established markets (Christensen 1997; Danneels 2004, 2006). Otherwise, dynamic capabilities deal with changes in the environment by integration, construction, and reconfiguration of the competences. This chapter aims to integrate Dynamic Capabilities to Disruptive Innovation Theory, fostering disruption through high order capabilities.

Disruptive innovation has been defined as a product or process that changes the basis of competition, offering valuable attributes for emerging segments ignored by the mainstream market. However, literature presents incipient information on how to achieve the outcome of this process. This study demonstrates that dynamic capabilities are the key ability to create new and innovative ways of competitive advantage in highly volatile environments through integration, building, and reconfiguration of a set of internal and external competences.

This chapter introduces the DI and dynamic capabilities concepts and components, in order to evince the structure that connects them in order to establish the Disruptive Strategy Deployment. Based on the findings, it has been established that a powerful way to catalyze disruption is an iterative and no lineal process of: sensing—disruptive opportunities identification; seizing—deploying disruptive strategy; and transforming—organizational asset reconfiguration.

2 Methodology

The process of disruptive innovation is related to the dynamic capabilities approach in its application and relevance to the context of disruption. They are addressed through an analytical-descriptive perspective. The literature review regarding both dimensions—dynamic capabilities and disruption theory—was analyzed by capturing foundations and characteristics in order to integrate them as a powerful way for disruption. The methodological tools used were: (1) Disruptive innovation attributes, (2) Dynamic capabilities approaches and characteristics, and (3) The two-dimension articulation and integration. All of them are qualitative.

3 Disruptive Innovation

Christensen (1997) suggests that disruptive innovation brings a different value proposition to a market regarding established products in mainstream markets, but they have attributes that a few fringe and new customers value. Lettice and Thomond (2002, p. 249), from a product perspective, quote: “A disruptive innovation is a successfully exploited product, service or business model that significantly transforms the demands and needs of a mainstream market and disrupts its former key players”. Additionally, Danneels (2004, p. 248) states: “A disruptive technology is a technology that changes the bases of competition by changing the performance metrics along which firms compete.” But disruptive innovation could be defined as a process in which new technologies displace existing ones by creating new markets with attributes that initially the main market did not value and changing the basis of competition.

The characteristics exhibited in Table 1 emerge from literature: Disruptive innovations usually emerge from marginal markets—overlooked by mainstream market—offer different value proposition and are affordable—cheaper simpler, smaller (Christensen 1997; Govindarajan and Kopalle 2006).

3.1 Marginal Markets

According to Christensen and Raynor (2003) disruptive innovations are generated in market spaces or positions that established companies usually overlook because they are focused on meeting mainstream and high-end customers. Disruptive innovation can emerge from low market or new market. There are empty positions generated from established companies that attend the demanding and more profitable customers—low market—with services and products with better performance in a specific valued dimension and avoiding less profitable customers. This creates a gap in which disruptors focus in offering good enough products and services for these

Table 1 Disruptive innovation characteristics

Author	Characteristics
Christensen (1997, p. 75)	I. Disruptive technologies emerge in low-end segments or new markets. In general, they are ignored by established companies. II. Disruptive technology improves performance by sustaining innovation to meet the needs of the main market III. Disruptive technologies are generally simpler, cheaper, and more convenient.
Thomond and Lettice (2002, p. 4)	I. It begins its success by meeting the unfulfilled needs of an emerging or niche market. II. Its set of performance attributes, highly rated by niche market customers, is not initially appreciated by mainstream markets. III Mainstream market customers, as well as competitors, value different performance attribute sets and, therefore, view the innovation as substandard. IV. Niche market adoption enables investment in the product, service, or business model to increase its performance. It can then create or enter new niche markets and expand customer numbers. V. Awareness of the product, service, or business model increases, forcing and influencing change in the mainstream markets perception of what it values, and VII. The change in the mainstream market perception of what it values is the catalyst that enables the innovation to disrupt and replace existing mainstream products, services, or business models.
Tellis (2006, p. 34)	I. A new disruptive technology initially underperforms the dominant one along the dimensions mainstream customers in major markets have historically valued. II. Disruptive technology (a) has other features a few fringes (and generally new) customers value. Products based on disruptive technologies are typically (b) cheaper, (c) simpler, (d) smaller, or (e) more convenient than those established on the dominant technology. III. (a) The leading firms' most profitable customers generally do not want and indeed initially cannot use products based on disruptive technologies. So (b) disruptive technologies are first commercialized in emerging or insignificant markets. (c) Incumbents conclude that investing in disruptive technologies is not a rational financial decision for them. IV. The new disruptive technology (a) steadily improves in performance until (b) it meets the standards of performance demanded by the mainstream market. V. At that point, (a) the new (disruptive) technology displaces the dominant one and (b) the new entrant displaces the dominant incumbent(s) in the mainstream.
Govindarajan and Kopal (2006, p. 13)	I. The innovation underperforms on the attributes mainstream customers value. II. The new features offered by the innovation are not valued by the mainstream customers; III. The innovation is typically more simple and cheaper and is offered at a lower price than existing products. IV. At the time of its introduction, the innovation appeals to a low-end, price-sensitive customer segment, thus limiting the profit potential for incumbents. V. Over time, further developments improve the innovation performance on the attributes mainstream customers value to a level where the innovation begins to attract more of these customers.
King and Baatartogtokh (2015, p. 79)	I. Incumbents in a market are improving along a trajectory of sustaining innovation. II. They overshoot customer needs. III. They possess the capability to respond to disruptive threats. IV. Incumbents end up floundering as a result of the disruption.

Source: Authors

ignored customers. This is how non-customers are converted into customers through the new market position disruptors.

Complementarily, Govindarajan and Kopalle (2006) point out that the disruption construct can be both low-tech (less-radical) and high level (technologically more radical) because it is different from the dimension of radical disruptive innovations. They offer four reasons why high-level disruptive innovations also create a dilemma for established companies: (1) Major clients do not value the new performance characteristics at the time of product introduction. (2) Innovation performs poorly on the attributes that the main customers value. (3) Innovation attracts an emerging or insignificant niche market. And (4) while the disruptive product may offer a higher margin per unit, the smaller perceived market size makes the profit potential appear limited.

3.2 Value Proposition in Main Attribute

Main attribute performance refers to the extent to which an innovation improves a specific attribute or combination of attributes most valued by mainstream markets. Christensen (1997) states that the same attributes that make disruptive products lack value in the main markets, they constitute their strengths to be sold in emerging markets. Adner (2002) in this regard argues that the customers' performance requirements are met due to the technology development progress. Then, they are exceeded and the customers will not be able to pay for these improvements, which opens the door for—disruptive—lower priced, lower performance products and services that get the customer's attention.

The mainstream customers value some performance characteristics that initially the disruptive innovations are not able to supply. Then, established companies focus on improving these performance metrics. This tendency to remain close to mainstream customers leads the efforts to the continuous improvement of the performance of the existing technologies oriented to satisfy this market segments. Likewise, the rate of technological improvement in established innovations exceeds the absorption capacity of the market segments they serve, opening an opportunity for potential disruptive innovations that offer a set of secondary attributes in over-served market segments (Adner 2002).

3.3 Performance Oversupply

The oversupply in performance metrics allows clients to begin to value attributes that had been previously classified as secondary (Adner 2002; Christensen 1997; Danneels 2004). Christensen (1997) uses the term performance oversupply to explain why customers adopt disruptive innovation when there are more sophisticated options in market. Three clear factors stand out by which companies tend to

move up the market: best profit margins offered by higher markets, customers inertia to move in the same direction and difficulties that emerges in the face of cost structures that lower markets' need. However, this upward movement of the market generates a market vacuum that tends to be filled by entrant companies that have more appropriate technologies and cost structures to compete within the value network. Adner (2002, p.669) argues that "The principle of performance oversupply states that once consumers' requirements for a specific functional attribute are met, evaluation shifts to place greater emphasis on attributes that were initially considered secondary or tertiary". While Yu and Hang (2010) suggest that supply excess of performance—due to the dominant innovation in the primary attributes—is a necessary condition for the existence of market disruption; Adner (2002) concludes that although it is a condition that fosters disruption, it is not a determining factor because other attributes predominate.

On the other hand, Christensen (1997) point out that price is widely highlighted as a decisive aspect in disruptive innovation and argues that disruptive technologies are usually cheaper. The reason is that they are new technological combinations, not derived from large investments in R & D, that combined with new business models and cost structures with better gross margins allow lower prices to be offered. In the same way, Adner (2002) argues that preferences are affected in terms of the willingness to pay for a given attribute, when there are budget limitations or the ability to assimilate these functionalities is less than what is required by the technology.

4 Dynamic Capabilities

Different definitions have been given to the concept of dynamic capabilities under different perspectives (Garzón 2015; Teece et al. 1997; Winter 2003; Zahra et al. 2006; Zollo and Winter 2002); Teece et al. (1997, p. 515) states that dynamic capabilities are based on the ability to achieve new forms of competitive advantage. They adopt the term *dynamic* to refer to the capacity to renew competences so as to achieve congruence with the "changing business environment" and the term *capabilities* to emphasize: "the key role of strategic of management in appropriately adapting, integrating and reconfiguring internal and external organizational skills, resources and functional competences to match the requirements of a changing environment." Consequently, dynamic capabilities are defined as "the firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments." For these authors, dynamic capabilities consist of identifiable routines, organizational processes, and strategies, such as partnerships and product development, whose strategic value lies in their ability to manage the resources that lead to the creation of value (Janzkoviski and Takashi 2015). Routines refer to a sequence of repeated actions that is normally codified in how companies do things, thus, organizational routines include those related to organizational transformation and transcend both individuals and groups.

Ambrosini and Bowman (2009) underline that the dynamic capabilities concept should not be taken as the union of two terms; that is, capacities must not be separated from the adjective dynamic—while capacities are based on the competence of the present and are static, dynamic capacities are future oriented and alter those capacities as resources. Capabilities are processes for the use of resources or can be part of the resource set as suggested by Barney (1991). The term dynamic has been referred to dynamism of the environment, which is incorrect because the dynamic capabilities can operate in relatively stable environments. Others refer to dynamics itself as capacity, but it is also incorrect, as indicated above, to address the capabilities dynamics from a resource perspective. Therefore, the dynamic term refers to the change and renewal of the base resources (Ambrosini and Bowman 2009).

Eisenhardt and Martin (2000) argue that the potential for long-term competitive advantage lies in the early use of dynamic capabilities. They define dynamic capabilities as the firm's processes that use resources to match and even generate market change. Dynamic capabilities thus are the organizational and strategic routines by which firms "achieve new resource configurations as markets emerge, collide, split, evolve, and die" (p. 1107).

On the other hand, Zollo and Winter (2002, p. 334) focus on organizational learning as a source of dynamic capability and define it as "a learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines, In pursuit of improved effectiveness". While Winter (2003) associates concepts of capabilities and organizational routines, and defines the organizational capability as a routine or a set of routines that gives management to a set of decision options to produce significant results. The routine is a learned behavior, highly standardized, repetitive or almost repetitive. For Teece et al. (1997), organizational routines or competences are generated when the specific assets of a company are brought together in integrated groups that include individuals and groups to allow distinctive activities to take place, which constitute routines and organizational processes. Some examples are quality, miniaturization, and systems integration. These competences are usually viable through multiple product lines and can be extended outside the company to embrace the alliance partners. As indicated above, routines are patterns of interactions that represent successful solutions to particular problems. These patterns of interaction reside in group behavior, although certain subroutines may reside in individual behavior.

Dynamic capabilities involve changes and can be hierarchical. Zahra et al. (2006) define dynamic capabilities as the ability to reconfigure the resources and routines of a company in an imagined way and considered appropriate by its main decision makers. For these authors, definitive solutions and routines are not created for the operations, but the capabilities that the managers have developed are successively reconfigured or reviewed, especially when the environment is dynamic and unpredictable. Overcoming some limitations of the previous definitions—vague, confused, tautological—Barreto (2010, p. 271) offers an integrating definition by stating that: "dynamic capability is the company's potential to solve problems systematically, based on its propensity to perceive opportunities and threats, to

make timely and market-oriented decisions, and to change their resource base.” Fundamental aspects arise within this concept, which can be classified into four dimensions:

1. The propensity to perceive opportunities and threats: there must be a capability to analyze and monitor capabilities landscape and changes in the environment.
2. Propensity to make decisions on time, which is the process of managing timely strategies adjusted to changes in the environment, i.e., the ability to quickly achieve reconfiguration and transformation before competitors.
3. Making market-oriented decisions, as important as making decisions on time, is that the content of major decisions be the way in which company will offer greater value to its clients based on an effective and efficient business culture.
4. Propensity to change the resource base is a common aspect that arises in the literature and includes the propensity to create, extend, or reconfigure the resource base (Barreto 2010; Li and Liu 2014).

Teece (2007) points out that dynamic capabilities can be divided into (1) Sensing, perceiving and modeling opportunities and threats; (2) Seizing, mobilizing resources to take advantage of opportunities and create value; and (3) Transforming, to remain competitive through improvement, combination, protection and, if necessary, the reconfiguration of tangible and intangible business assets of the company—(Janzkovski and Takashi 2015; Teece et al. 2016). These must be developed by what Teece (2007, p. 1347) calls entrepreneurial management, which involves sensing and seizing; that is to say, “It involves recognition of problems and trends, directing (and redirecting) resources, and reshaping organizational structures and systems so that they create and address of technological opportunities while staying in alignment with customer needs.” Teece (2007) integrates strategic and innovation aspects, offers a framework of critical dynamic capabilities to maintain a high organizational performance in a fast and universally dispersed innovation economy and does not establish specific processes of dynamic capabilities. Aspects as innovation capability, learning capability, adaptation, and absorption capabilities are immersed in the proposal for the present work, hence it is relevant to address this perspective.

5 Disruptive Innovation and Dynamic Capabilities

Integration of dynamic capabilities in disruptive innovation has been framed in three mechanisms, which must act synergistically and iteratively:

- Identification of opportunities for disruption—Sensing—refers to the scanning of technologies and recognition of marginal or emerging markets that can be exploited.
- Deployment of the disruptive strategy—Seizing—in which strategic activities are established to take advantage of opportunities and create value, considering that organizations must develop business models that facilitate the design and creation of simpler products, more accessible, and more economical.

- Transformation of organizational capabilities—Transforming—to remain competitive through the improvement, combination, protection and, if necessary, reconfiguration of tangible and intangible assets of the company—business architecture that allows generating new combinations in terms of adaptability of resources and capacities (Janzkoviski and Takashi 2015; Teece 2007, 2012).

5.1 Identification of Disruption Opportunities

In a competitive environment, sensing technological and customer changes, regulations, emergence, and market mobilization is a fundamental activity for disruptive innovation (Harreld et al. 2007; Teece et al. 2016). Understanding of markets is based on the latent demand, industries evolution, customers' needs, and technological possibilities, as well as on the behavior of the suppliers and competitors. Therefore, it is imperative to identify the opportunity for disruption in the New Market and in the Low End of the market—segments that previously had no access to them due to knowledge and complexity in their use, or because of their prices or inaccessible places within the offer. On the other hand, it is imperative scanning existing technologies in different value networks, in order to generate new product architectures that offer good enough functionality, being cheaper, simpler, and more accessible. The key characteristics in disruption are the products and services offered to the population that has limited access to the existing products and low purchasing power.

Christensen and Raynor (2003) propose detection premises for the new and low market levels. On the one hand, if the potential is in a new market, there must be an affirmative answer—at least one out of two, usually both—to the questions:

- Is there a large number of people who historically have not had the money, equipment, or skills to do this thing for themselves, and as a result they dispensed with it or had to pay someone with more expertise to do it for them?
- To use the product or service, do customers need to move to an inadequate or centralized location?

To establish the potential of a low-level disruptive innovation, you must respond affirmatively to: Are there clients at the low market level who would be very satisfied to buy a product with less, but still acceptable functionalities—sufficiently good—that could get it at a lower price? And, can we create a business model that allows us to generate attractive benefits to capture the business of over-satisfied customers at the low level at the discount prices required?

These sets of questions must be combined with a final and decisive question that must be answered affirmatively: is the innovation disruptive for all the established companies important in the industry? If it may seem sustained for one or several companies in the sector, the probability of success will favor the established ones (Christensen et al. 2002, 2008).

Christensen (1997) states that disruptive innovation arise from existing technologies in new ways and are not inherently disruptive or sustained. Companies do not always identify a clear market for the new development of technologies in the established business model. However, they can be exploited by disruptors because they generate value for customers (Chesbrough and Rosenbloom 2002).

Universities as sources of information, Research & Development activities, suppliers as a source of innovation in components to make new designs, and activities developed by competitors, generate information that must be collected and analyzed in a context of utility and impact for the organization. There may be changes in the way products are manufactured, sold and distributed, resulting in new business models without a direct impact on technology, but on the market that become disruptive innovations. One of the best-known examples is that of [Amazon.com](https://www.amazon.com) that displaced established companies by offering new ways to access products.

While established companies usually focus on meeting the needs of established customers in a so-called sustained trajectory, disruptive innovation arises in emerging and discouraged markets with attributes different from those that the main market values, hence there must be an emerging customer orientation to identify opportunities for disruption. The imperative is to identify the dimensions of performance and attributes currently valued by clients and by those who have been marginalized by the perception of an oversupply of performance in the attribute or trajectory initially valued. Consequently, new technologies can bring new valuation attributes that must be identified through a careful observation of the technological environment and the value networks to which the company belongs. Other technologies can generate architectural innovation by analyzing the technologies that directly affect the organization not only in its different dimensions, but in dimensions not previously valued. Likewise, the architecture of a disruptive product is linked to suppliers, because they can be innovation enhancing in final product. Suppliers develop rapidly, and continuously technological components designs. This can be beneficial for the organizations creating new combinations or architectural innovations, opening up disruption possibilities.

6 Disruptive Strategy Deployment

Disruptive innovation is a matter of creativity, ingenuity, and intuition rather than activities related to R&D. Once the technological opportunities for opening new markets have been identified, they should be made visible in new products and services, which, as already mentioned, must have specific characteristics in order to be disruptive in terms of ease of use, access, and low prices. Business model designs structures that create greater value to customers considering income constrains, access, and knowledge limitations. To achieve this goal, products and services must be supported by a new business model that allows the opportunity of consolidation. The new architectures in product, but also in the delivering value, reflect the

identity and organization capability to deliver what the customer needs in a timely and accessible way.

Business model is defined by Amit and Zott (2009, p. 2) as “the bundle of specific activities that are conducted to satisfy the perceived needs of the market, including the specification of the parties that conduct these activities (i.e., the focal firm and/or its partners), and how these activities are linked to each other.” This definition includes the following questions: (1) which technologies and features are integrated into the product or service; (2) how structure—or if a new structure is required—of business revenues and costs is designed; (3) in which way are technologies assembled; (4) which market segment is targeted; (5) which are the mechanisms for capturing value (Chesbrough and Rosenbloom 2002; Teece 2007). Therefore, decisions about how value is captured from the architecture of a business are based on strategic capabilities. Teece (2007, p. 1130) states: “the ability to create, adjust, perfect and if necessary replace a business model is the foundation of dynamic capabilities.” Additionally, Christensen and Hart (2002) mention that a disruptive business model consists of a distribution system, operating processes, and a structure of costs in which the profit margins are smaller but the net returns of assets they are higher.

Christensen and Raynor (2003) state that the elements that cause disruption come from a new business model which—initially—must determine what is needed. They determine the value proposal of the client. This requires the definition of what product, technology, and service will be offered and how the consumer or customer will use it, i.e., how the company helps to solve a problem or to supply a need by offering new and better solutions at a reduced cost—doing the job better at a more adequate price. Then, the architecture of the product or service is paramount, since it defines the implicit characteristics to access those customers, in which although products or services offered have a lower performance, they are good enough to be valued by the consumer in the dimension that values mainstream market. In addition, they offer value in another dimension that mainstream has not usually valued.

7 Transformation of Organizational Capabilities

Disruptive innovation is understood as a process that integrates identification and exploitation of potential disruptions offered by the market. It must also integrate organization capability to transform resources and organizational competences, i.e., the ability to recombine and reconfigure organizational assets and structures as the company grows and markets and technologies change. Continuous efforts must be made to build, maintain, and adjust the complementarity of products, systems, and structures, through the decentralization of decisions, which may include more autonomy in business units and open innovation models integrating external knowledge (Barreto 2010; Eisenhardt and Martin 2000; Teece 2007; Zahra et al. 2006). In addition, Teece (2007, p. 1344) highlights the importance of the integration of know-how in the process, i.e., creation of learning, knowledge sharing, and knowledge

integration procedures. He concludes that “selecting an appropriate business model, making strategic investment decisions correctly and looking for incremental innovations can keep a highly competitive company for a decade and more.”

8 Organizational Capabilities

Organizational capabilities are transversal in disruptive strategy development since they involve a set of knowledge and skills in decision-making at the managerial level. A fundamental aspect to carry out disruptive innovation is what Teece (2007) names entrepreneurial management. In this approach, the management team must have an entrepreneurial spirit, consistent with the detection and understanding of opportunities, and initiative and vision in the use of new and existing technologies. It also must recognize and detect new opportunities and expertise to address them and learn from small failures. Therefore, the entrepreneurial management team must have capability to recognize trends and future situations, orienting—and reorienting—the resources, structures, and organizational systems to create and address technological and market opportunities. These capabilities are in continuous transformation and the main agent of this change resides in this entrepreneurial direction.

The managerial skills and intuition that allow to succeed in organizations are a consequence of previous experiences, therefore, the team must be composed of people with experience, developed intuition, and the ability to understand and manage potential and inherent problems in the creation of a new innovation with disruptive potential (Christensen and Overdorf 2000, p. 1322). On the other hand, what is called intrapreneurship must be maintained in order to take advantage of the discoveries and ideas that are generated within the organization. Intrapreneurship has to do with two aspects: (1) setting good business practices that people use to innovate in large organizations and (2) covering both individual and entrepreneurial team actions, to serve to the interest of companies with or without official help. The teams in charge of developing new products, such as sales—which are directly in contact with customers—can be a valuable source for sensing opportunities and market gaps.

Evolving specialized teams to collect ideas with innovative potential and evaluating them is imperative within entrepreneurial management. This is combined with a long-term vision given the conditions under which disruptive innovation can be developed, along with the subjective incentive plans, instead of with a short-term oriented one. The company must assign human and financial resources for identifying new potential clients, building relationships with them and developing knowledge of them, because these emerging segments are the ones that value disruptive innovations in the beginning. The organizational structure has a great influence on the emergence of disruptive innovation. Christensen and Raynor (2003) find a negative correlation between the size of the company and the success of disruptive innovation. The development of this type of ideas requires a set of resources,

processes, and routines that can oppose to the main company. Therefore, companies must be flexible having smaller business units or creating or sponsoring startups that are managed independently of the structure of the main company, but that in turn can take advantage of the complementary assets and of disruptive innovation opportunities.

Likewise, organizational culture plays a decisive role in this process, as mentioned by Lucas and Goh (2009). Culture refers to a set of attitudes and practices that are shared by the members of the company and become tacit. As soon as culture is averse to change and risk, disruptive innovation has no chance. A culture that encourages members to be in a continuous process of innovation allows processes to be more flexible and open to new opportunities, knowledge, and learning. Figure 1

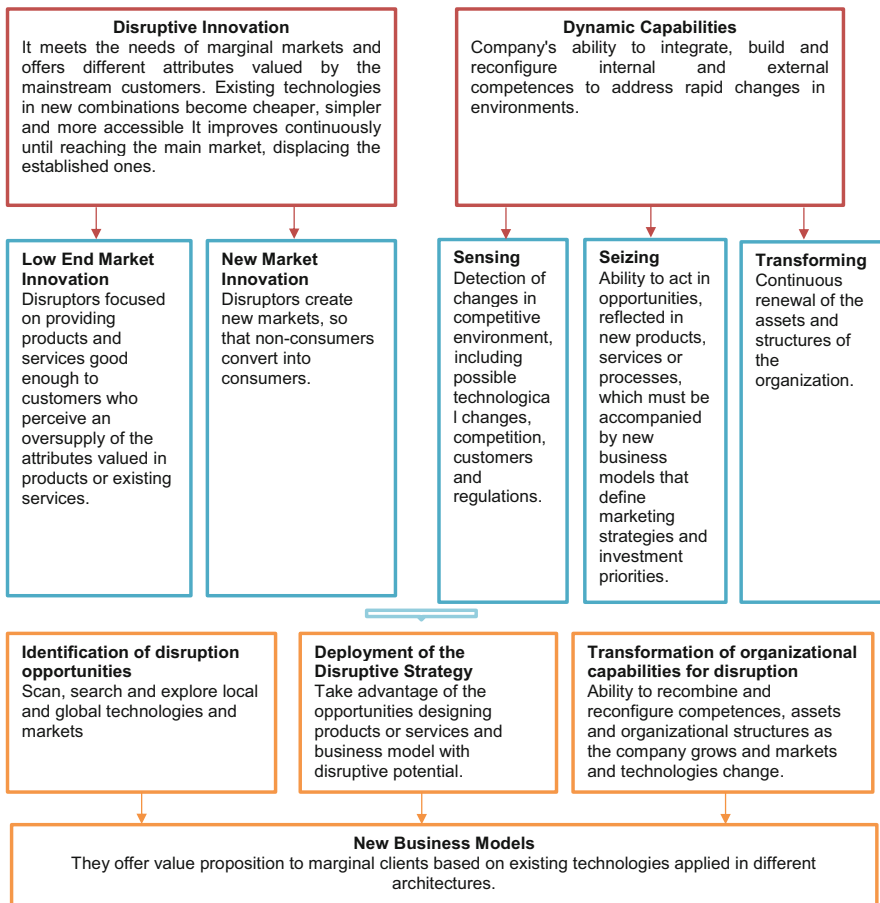


Fig. 1 Disruptive innovation framework from dynamic capabilities approach (Source: Developed by the authors)

presents an integrative perspective of the dynamic capabilities in the process of disruptive innovation, with each of the aspects mentioned above.

9 Conclusions

Disruption process entails identification and exploitation of both technological and market opportunities. Three mechanisms for disruption framed in the micro-foundations of dynamic capabilities are proposed. The first one consists on the identification of disruption opportunities, which consists in scanning, searching, and exploring local and global technologies and markets. The scanning involves constant monitoring of the technologies developed for components, in universities as a source of information, and of the developments made by companies in different value networks that are adaptable to other ones. The identification of marginal markets includes the understanding of needs—explicit and latent—the development of technologies that allow new things to be done, changes in how customers use a product or service and in the way consumers adopt new technologies or transformations in activities, tastes, preferences, and motivations. These technologies are reflected in the low level of the market, providing sufficiently good products and services to customers who perceive an oversupply of the attributes valued in existing products or services—and a new market—convert nonconsumers into consumers.

The second one is about the Deployment of the Disruptive Strategy that takes advantage of the identified opportunities, designing services or products and a business model with disruptive potential. This includes: (a) Customer value proposal: It designs products and services that are more economical, simpler, and more accessible with respect to the existing offer, directing efforts to clients with low income, lack of knowledge, and with difficulty of access, (b) Value networks: Relations with suppliers that develop new technologies, customers, and other features to increase the capture of value, (c) Structure of income and costs: Generation of income from economies of scale and scope, low gross margins, minimization of administration and selling expenses, and high turnover in assets and (d) Management of resources and key processes: It must design and configure the processes, both operational and organizational, that allow disruption.

The third one is Transformation of organizational capabilities for disruption is defined as the ability to recombine and reconfigure competences, assets, and organizational structures as the company grows and markets and technologies change. The organizational capabilities include an entrepreneurial management tending to identify opportunities for disruption, conformation of specialized teams to manage ideas with disruptive potential and flexible resource allocation processes that allow the development of disruptive innovation. This should be integrated to an organizational culture that drives members to be in a continuous process of innovation, allowing processes to be more flexible and open to new opportunities, knowledge, and learning.

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Part V
Law and Regulation

Formation of Contracts via the Internet



Doruk Utku

Abstract The ability of sellers and suppliers to communicate with customers has prospered with the increase in communication methods, especially the wide usage of the Internet. Sellers and suppliers are intensely benefiting from the opportunities created by information technologies for marketing their goods and services to targeted customers. Buyers can easily attain goods or services produced anywhere and save time by quickly purchasing them through the Internet, while staying at home or office. However, contracting by electronic communication causes new challenges to the traditional legal principles of contract formation that are essentially based on oral or old fashioned paper contracts. This chapter presents the legal framework of electronic contracting from a comparative law perspective and focuses on some specific issues, which are subject to discussion among legal scholars, like the legal aspects of electronic contracting methods, communication of assent in digital environment, and the legal effects of displays in online shops. In conclusion, a critical review is presented of the discussions about instantaneousness of e-mail communication, viewpoints that are in favor of nonbinding legal effects of the displays in online shops and necessity of the concept of “electronic agent.”

Keywords E-commerce · Electronic contract · Online contract · Online shop · Contract formation · Electronic agent

1 Introduction

The increasing growth of Internet-based technologies over the past 30 years has been fascinating. Digitalization has deeply influenced and changed the workings of many areas from finance and marketing to healthcare, science, energy, and even agriculture (OECD 2017). Contract law, on the other hand, is in fact one of the least affected areas by digitalization. Electronic commerce alters the process of agreement, rather

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than the substance of contracts (Kidd and Daughtrey 2000). So, the terms “online contract” or “electronic contract” do not refer to any specific legal category of contracts, but only to a mode of contract formation. Being formed by means of an electronic communication method is the only essential difference between an electronic contract and any other legal transaction (Reed 2004; Kosmides 2017; Härting 2017).

In civil law, like formation of any oral or paper contract, formation of electronic contracts can be summarized in three words: Offer, acceptance, and consensus (i.e., meeting of the minds). According to the opinion prevalent in both common and civil law jurisdictions (e.g., Mehrings 1998; Murray 2000; Kidd and Daughtrey 2000; Altınışık 2003; Özdemir Kocasakal 2003; İnal 2005; Glossner 2013; Mik 2016; Akipek Öcal 2017) the principles of existing contract law (with adaptations if necessary) would be sufficient to govern issues of electronic contracts and there is no need to establish a completely new set of rules specific for such contracts. Therefore, resolution of the disputes arising out of electronic contracts is merely a matter of application of the general contract law to some particular contractual relationships by taking the legal aspects peculiar to e-commerce into specific consideration (Reed 2004; Todd 2005).

On the other hand, some authors like Smith et al. (2007) and Wang (2014) argue the necessity of legislations specific for electronic transactions to reform the “insufficient” existing laws that create obstacles to e-commerce; while some others like Rogers (2011) suggest that the courts need to be more courageous in dealing with the issue of “online” contract formation and should be ready to move away from the traditional contract formation rules when necessary. It is possible to say to some extent that the international e-commerce regulations as well as various national regulations which exclusively regard e-commerce reflect these opinions. However, it is also important to note that current regulations aim to harmonize existing contract laws of states in respect of e-commerce, rather than to create a new and comprehensive parallel legal regime for electronic transactions (Kaufman Winn and Haubold 2002; Kryczka 2005).

As indicated by UNCITRAL (United Nations Commission on International Trade Law) (1999) Model Law on Electronic Commerce (MLEC) Article 5, *Council Directive 2000/31/EC of 8 June 2000 on electronic commerce* (EC E-Commerce Directive) Article 9 (1), and United Nations Convention on the Use of Electronic Communications in International Contracts (UN CUECIC) Article 8 (1), the mentioned harmonization is being carried out under the common maxim: No contract shall be regarded as nonexistent, invalid, or ineffective just because it has been concluded by means of electronic communication. Actually, after years of legal discussions, this maxim seems to be the only firm legal principle which is specific for electronic contracts. The rest is still principally a matter of application of the traditional contract formation rules to formation of electronic contracts.

This chapter presents an overview of the legal aspects of electronic contract formation from a comparative law perspective. The remainder of the study is structured as follows: Sect. 2 describes the concept of “electronic contract” and common methods of electronic contract formation via the Internet as well as the

essential differences between the terms “electronic contract” and “distance contract.” In Sect. 3, the problem of determination of the time of electronic contract formation is discussed by taking the matters of communication and interpretation of electronic assent into consideration within the context of traditional national contract laws and the rules of international e-commerce regulations. The study is concluded by commenting on efficiency of the existing contract formation rules applicable to electronic contracts.

2 The Concept of “Electronic Contract”

The term “electronic contract,” in the broadest sense, is not limited to Internet-based communications and covers all contracts concluded by use of any electronic communication method, including SMSs, telematics services, telexes, and facsimiles. The UNCITRAL MLEC (Article 2 [a]; Article 11 [1]) as well as the UN CUECIC (Article 4 [b–c]; Article 8 [1]) have adopted this broad definition. However, the most common use of the term refers to the contracts that are formed by the use of Internet-based communication technologies (see, e.g., Sparrow 2000). This narrower meaning is referred to also as “online contract” (Perdue 1996; Wang 2014; Mik 2016).

For a contract to be deemed as an electronic contract, it is sufficient to be created in part through electronic communication. Thus, an electronic contract can be concluded exclusively by methods of electronic communication or also by a combination of electronic, paper, and/or oral communications (Perdue 1996). It is not important whether the contract will be performed offline (e.g., by sending a cargo) or online (e.g., by making digital content available for download through the Internet).

2.1 *Methods of Electronic Contracting via the Internet and Their Legal Aspects*

The most common methods of contracting via the Internet are e-mailing, contracting through website, and the use of electronic data interchange (EDI) systems. It is of course also possible to conclude a contract via instant messaging (IM), voice over IP (VoIP) systems (like Internet telephony or Internet video conferencing), or even in an internet chat room. However, legal discussions about contract formation focus on e-mail, website, and EDI, rather than the other means of online communication which are indisputably instantaneous and resemble the traditional telephone (public switched telephone network) communications.

Exchange of e-mails is probably the most used online contracting method in business and technically it seems to be the online equivalent of traditional postal communication. However, although the usage of traditional postal system is definitely not an instantaneous method of communication, it has been subject to

discussion whether communication by e-mail is instantaneous. In civil law jurisdictions, whereas e-mail is unanimously not considered instantaneous communication (e.g., Wildemann 2000; Süßenberger 2000; Kırca 2000; Sözer 2002; Özdemir Kocasakal 2003; Ernst 2007; Sarıakçalı 2008; Weber and Volz 2010; Wien 2012; Kötz 2012; Köhler and Fetzer 2016; Redeker 2017; Ellenberger 2018), some authors (Altınışık 2003; Falcıoğlu 2004; İnal 2005; Sağlam 2007; Kılıçoğlu 2017) suggest that it should be treated as instantaneous communication only under exceptional circumstances in which contracting parties are simultaneously online to exchange e-mails like IM. In common law, on the other hand, the discussion is of more importance—and hence, more intense—because of the “dispatch theory” which is reviewed below (in Sect. 3.2). Also in common law jurisdictions, according to the prevalent opinion (e.g., Murray 2000; Cummiskey 2006; Smith et al. 2007; Todd 2005; Mik 2016; Llyod 2017; Rowland et al. 2017), e-mail cannot be deemed as a method of instantaneous communication. This is true in *technical* sense. Since the e-mail system operates through intermediaries and the messages have to be routed by these third persons (Internet service providers—ISPs), there is no direct communication between the parties; thus, it is not possible to think of instantaneity of e-mails. However, some authors like Perdue (1996), Dickie (1998), Rogers (2011), and Wang (2014) have strongly argued that, though not instantaneous, the rapidity of e-mail communication which is incomparable with the speed of postal services should be legally taken into account. Moreover, in recent cases of David Baxter Edward Thomas, Peter Sandford Gander v BPE Solicitors (a firm) (2010) EWHC 306 (Ch) and Greenclose Ltd. v National Westminster Bank plc. (2014) EWHC 1156 (Ch), the High Court of Justice of the UK has defined e-mail as “instantaneous” or “near-instantaneous” communication.

Websites can be used for various commercial purposes. They can be designed merely to give information about a business or advertise goods and services, as well as to interact with customers, deliver digital content to customers or even to provide the customers with a platform to enable them to interact with each other. Today, especially for consumers, the most common method of electronic contracting through websites for purchasing goods is online shopping. Some websites serve as digital market places for their “members” who want to sell goods or participate in online auctions. It is important to note that the opportunity of electronically contracting through a website requires “interactivity” of that site. Provided that it has interactivity, it is, at least to some extent, possible to treat a commercial website as online equivalent or extension of a real office or shopping store. Of course, this qualification should be determined depending on the manner and level of its interactivity. Besides, regardless of the level of interactivity, communication performed through a website cannot be considered an instantaneous communication, unless performed by use of a VoIP system.

EDI systems provide business organizations with the ability to conduct automated “computer-to-computer” or “computer-to-human” communications. The assent (offer and/or acceptance) that is required to form a legal contract can be generated, manifested, and communicated over the Internet automatically by these computerized systems. To be honest, this process is something new to the traditional

understanding of contract law, since in this understanding assent manifested by a “person” may be communicated by a “machine.” Thus, the emergence of “business transactions without human involvement” gave rise to a new legal concept, which is called “electronic agency.” However, the common and civil laws have given different approaches to this new concept. Actually, conclusion of contracts by EDI systems poses a problem neither in common law nor in civil law jurisdictions. The UN CUECIC Article 12 expressly states that legal contracts can be formed by use of automated message systems. Additionally, recognition of the legal effectiveness of contracts formed by EDI is arguably derived from the maxim “no contract shall be regarded as ineffective on the sole ground that it has been concluded electronically” (see, e.g., Todd 2005; Wang 2014). What is subject to discussion is the legal aspect of the process, rather than validity of its result.

In the opinion of many common law authors (e.g., Allen and Widdison 1996; Karnow 1996; Kerr 1999; Perdue 1996; Reed 2004; Smith et al. 2007), EDI systems (particularly the ones working more autonomously and capable of taking initiative within a pre-programmed framework) can be treated as equivalents of human agents with authority to act on behalf of principals. Although there are also some other authors (Sommer 2000; Todd 2005; Murray 2016; Rowland et al. 2017) who argue that “intention” of an EDI system is nothing else than the generalized prior intention of the system operator, apparently the use of the expression “electronic agent” has become widespread in common law jurisdictions. Today, it is possible to say that the expression “electronic agent” is starting to evolve into a legal term in common law jurisdictions (especially in US law).

There are also a number of civil law authors (e.g., Lerourge 1999; Weitzenboeck 2001; Altınışık 2003; Wettig and Zehendner 2003; Demir 2004; Ünal 2004; more recently Furrer 2018; Specht and Herold 2018; Weber 2018) who have argued in favor of the adoption of the concept of electronic agency. However, in civil law jurisdictions, the vast majority of legal scholars (e.g., Redeker 1984; Süßenberger 2000; Falcıoğlu 2004; İnal 2005; Ernst 2007; Sağlam 2007) have rejected such arguments and criticized them severely. Today, in civil law jurisprudence, manifestation, and communication of assent by automated and autonomous process of a computerized EDI system is commonly referred to as “computer manifestation” (*Computererklärung, bilgisayar beyanı*), a term which literally means “person’s assent that is manifested by computer,” to emphasize that the assent has been generated by “person,” (not “computer”) as an indirect and general intention to be embodied within the EDI system for each specific legal transaction (see Mehrings 1998; Taupitz and Kritter 1999; Gezder 2004; Glossner 2013; Kitz 2014; Eichhorn et al. 2016; Köhler and Fetzer 2016; Kosmides 2017). When considering “the subjective (will) theory of contract formation” that is prevalent in the civil law, this consequence does not seem surprising. It should be noted that in the context of will theory level of artificial intelligence is of no importance. Even a self-learning technology learns something, because its operator wants and pre-programs it to learn. Neither a dummy computer nor a high artificial intelligence technology can be deemed as equivalent of a human agent, unless it becomes able to “want” something independently from the will of its operator.

2.2 *Electronic Contracts and Distance Contracts*

“Distance contract” is a term of consumer law. It is defined by Article 2 (7) of *European Parliament and Council Directive 2011/83/EU of 25 October 2011 on consumer rights* (EU Consumer Rights Directive) as: “. . .any contract concluded between the trader and the consumer under an organised distance sales or service-provision scheme without the simultaneous physical presence of the trader and the consumer, with the exclusive use of one or more means of distance communication up to and including the time at which the contract is concluded.”

As it is easily understandable from this definition, the terms “electronic contract” and “distance contract,” though closely related, does not have the same meaning. Electronic contracts are generally categorized as “business-to-business” (B2B), “business-to-consumer” (B2C), or “consumer-to-consumer” (C2C) electronic contracts. On the other hand, as stated at Recital 20 of the Preamble to the EU Consumer Rights Directive, the method of distance communication that has been used to form distance contract could be a method of Internet communication as well as any offline distance communication method like mail order, telephone, or fax. Therefore, it would be appropriate to say that only one (“B2C”) category of electronic contracts constitutes one (“electronic”) category of distance contracts that are subject to mandatory legal rules aiming to protect consumers (Uzun Kazmacı 2016). The distinction between B2B and B2C electronic contracts can be clearly noticed from Articles 10-11 of the EC E-Commerce Directive, since in these Articles it is explicitly stated that the rules introduced by the Articles are to be applicable to electronic contracts “. . .except when otherwise agreed by the parties who are not consumers.” By *argumentum a contrario*, provisions of Articles 10-11 of the E-Commerce Directive are to be deemed as mandatory only for B2C electronic contracts.

However, for an electronic contract, being characterized as B2C is not sufficient to be deemed as “distance contract” in the sense of consumer law. First of all, by definition, to be a distance contract, the relevant contract must be concluded by exclusively using the means of distance communication. This prerequisite indicates that it is not possible for the contracts which are concluded by a combination of electronic and face-to-face communications to fall into the scope of this definition. Furthermore, the whole electronic contracting process must be carried out under a scheme that has been organized specifically for distance contracting. B2C electronic contracts only which meet these additional requirements qualify as “distance contract.”

3 **The Legal Aspects of Electronic Contracting Process**

Formation of a contract requires the mutual assent of the parties. To form a simple contract, each party can manifest the assent and communicate it to the other party in oral or written form, or even by conduct. Manifestation and communication of offer

and acceptance do not necessarily have to be in a specific form, unless the contract in question requires to be concluded in a special or solemn form for having legal effect.¹ In the context of electronic contracting process, there are two points that are of legal importance: (1) interpretation of assent to decide whether it constitutes a binding offer; and (2) determination of whether the acceptance has been communicated to the other party properly.

3.1 *Commercial Website Display: Offer or Invitation to Treat?*

An offer should unequivocally indicate the offeror's intention to enter into the contract in case the offeree's acceptance is communicated to him. Offer binds the offeror until it is rejected (or revoked if possible), provided that the condition of being unequivocal is fulfilled. Otherwise, the manifestation of intent can be deemed only as an "invitation to treat" (i.e., invitation to offer, *invitatio ad offerendum*), by which a person (does not make offer, but) invites other party to make an offer which the inviter would be free to reject or accept. An invitation to treat is an indication that the inviter is willing to enter into negotiations, not into a contract yet.

It is a common opinion that mass advertisement, which is a call for potential customers to make offer to purchase the relevant goods or services, cannot constitute a binding offer, but only an invitation to treat. Hence, display of goods or services on a commercial noninteractive website, which is deemed as "online advertisement," has usually been treated only as invitation to treat (e.g., Christensen 2001). Nevertheless, legal characterization of the display of goods or services on commercial "interactive websites," especially in "online shops," is subject to discussion. As emphasized above (in Sect. 2.1), it is possible to treat commercial interactive websites as online equivalents of real stores. Accordingly, jurists generally tend to treat such kind of online displays as they would treat display of goods in a real store; and in this context, national jurisdictions can be divided into two categories.

In some jurisdictions (like Germany, the UK, and the US), display of goods with price tags in a shopping store is treated in principle as invitation to offer. Vast majority of jurists in these jurisdictions are inclined to apply this black letter view of law also to displays in online shops (e.g., Taupitz and Kritter 1999; Wildemann 2000; Todd 2005; Smith et al. 2007; Wien 2012; Glossner 2013; Köhler and Fetzer 2016; Eichhorn et al. 2016; Härting 2017).

Some other jurisdictions in which the display of goods with price affixed is considered in principle to be "offer" fall into the second category. This presumption of "standing general offer" (*offerte ad incertas personas*) has been adopted by

¹Formation of such contracts, which may legally be required to comply with specific (offline) formal requisites, has been exempted from the scope of the EC E-Commerce Directive by Article 9 (2).

Swiss OR (*Obligationenrecht*) Article 7 (3) and Turkish CO (Code of Obligations) Article 8 (2). However, also in these jurisdictions some authors (Demir 2004; Gauch et al. 2014; Oğuzman and Öz 2018) argue that display of goods with statements of price in an online shop should be deemed only as invitation to offer.²

The opinion that treats website displays as invitation to offer aims to provide legal certainty for commercial website operators (Reed 2004) and is based on two justifications: (1) the need for protection of the sellers, who have limited stock of goods, against the risk of over-acceptance; and (2) the need for customer identification, especially when the traders wish to conclude contracts only with a certain category of customers (majors, residents in the EU, etc.) or need to check the creditworthiness of purchasers.

According to the first justification, the discretion to conclude contracts (i.e., the option to accept or reject an offer) should be left to the seller in order to prevent the seller from becoming bound by obligations to deliver goods in a quantity exceeding the available stock (the argument of “limited stocks” or “over-acceptance risk”). Many authors (e.g., Glatt 1998; Kırca 2000; Bozbel 2001; Altınışık 2003; Gezder 2004; İnal 2005; Topaloğlu 2005; Ernst 2007; Weber and Volz 2010; Kitz 2014; Kut 2016; Härting 2017; Kosmides 2017; Rowland et al. 2017), taking this justification into consideration, have asserted that the “invitation to offer” approach is applicable only to the sales of non-digital products, which would be delivered from physical stocks, and that contracts which are to be concluded for use of digital services or sale of digital products (of which download is technically not a “delivery,” but a “duplication”) fall out of the scope of the view of invitation to offer. Therefore, according to this opinion, web-offers to provide digital services or digital products via the Internet should be deemed as legally binding offers. Some of these authors (Süßenberger 2000; Bozbel 2001; Altınışık 2003; İnal 2005; Weber and Volz 2010; Antalya 2016; Redeker 2017; Rowland et al. 2017), focusing on the level of interactivity, go even further and suggest that it is possible for a web-offer to be treated as a binding offer if the customer can check the current prices and availability of the stocks, and complete the transaction by simply filling an online form. It has also been argued that if the statements on a website include all essential terms of the intended contract without reservation, even a lesser degree of interactivity which merely enables the customers to place purchase orders through that website should be sufficient to cause the web-offer to constitute a binding offer (Özdilek 2002; Falcıoğlu 2004; Akkurt 2011).

On the other hand, there are also some legal scholars who deny the treatment of interactivity as a legal criterion and argue for the possibility of treating even a noninteractive web display as an “offer.” In Turkish law, this view (Sözer 2002; Özdemir Kocasakal 2003; Sağlam 2007; Uyumaz 2007; Şeker 2012) has been based

²To make this view consistent with the “presumption of standing general offer” provisions of Swiss OR Article 7 (3) and Turkish CO Article 8 (2), it has been asserted that these provisions regard the display of physical goods themselves only, not of their pictures or films (Gezder 2004; Oğuzman and Öz 2018). For the contrary view see Antalya (2016).

on the “legal presumptions of offer” adopted in Article 8 (2)³ of the Turkish CO. In common law jurisdictions, the same opinion (e.g., Pistorius 1999; Mik 2016) has been advocated by relying on the precedents like the UK case of *Carlill v. Carbolic Smoke Ball Company* (1893) 1 QB 256 and the US case of *Lefkowitz v Great Minneapolis Surplus Store, Inc.* (1957) 86 NW 2d 689.

The rules in Articles 10 and 11 of the EC E-Commerce Directive that regulate the information and acknowledgment that shall be provided by website operator (i.e., service provider) during the course of electronic contracting through a commercial website are available to be interpreted in different ways by different jurists. Some authors like Reed (2004) state that acknowledgment obligation imposed by Article 11 on the trader makes it more likely that the customer’s final communication (of which receipt shall be acknowledged by the trader) amounts to the offer, while some others like Kırca (2000), Sözer (2002), and Sağlam (2007) argue that it is possible to consider a website display as a binding offer due to the provisions of Article 11. In fact, there is no rule in the EC E-Commerce Directive stating whether displays on a commercial website shall be deemed as offer or invitation to treat (Süßenberger 2000).

On the other hand, in Article 11 of the UN CUECIC, a contract proposal made through electronic communications which is not addressed to one or more specific persons but can be accessed by any person making use of information systems has been clearly defined as invitation to make offer. According to the provision, this presumption shall be applied, unless the facts clearly indicate that the party making such proposal intends to be bound in case of acceptance. According to the UNCITRAL’s (2007) explanatory note on Article 11 of the UN CUECIC, existence of an interactive system that is used to conclude contracts may constitute an evidence of the intention of the proposing party to be bound in case of acceptance in some situations. However, UNCITRAL (2007) also states that companies offering goods or services through interactive websites frequently indicate on their websites that they are not bound by those offers, and if the UN CUECIC had attached a presumption of binding intention to the use of interactive applications, it would have been undesirably reverse of “the case in practise.” This justification is so questionable. Companies are advised to use those disclaimers to avert a factual presumption of binding intention that might occur in the absence of a disclaimer (see Sparrow 2000). So, actually, usage of such disclaimers indicates that customers tend to believe in bindingness of an offer which is stated on an interactive commercial website, and that companies also are aware of this fact which is “the case in practice.” The alleged

³It is important to note a significant difference between Swiss OR Article 7 and Turkish CO Article 8. In Swiss OR Article 7 (3), only display of goods with price marks is considered as a basis for the presumption of (standing general) offer. OR Article 7 (2), in contrast, states that sending of tariffs, price lists, etc. does not constitute offer. On the other hand, in Turkish CO Article 8 (2), there are two legal presumptions: beside display of goods with price marks (the presumption of standing general offer); sending of tariffs, price lists, or suchlike is also deemed to be offer, unless otherwise understood clearly and definitely.

frequent use of the disclaimers cannot be a reason not to adopt a “rebuttable presumption” that shall be applied in case of absence of a disclaimer.

Judicial practice in Germany has followed the prevailing opinion in the German legal literature which is in favor of the “invitation to treat” perception. In website pricing error cases (e.g., AG Butzbach, 24.5.2002, NJW-RR 2003, 54; OLG Frankfurt/Main, 20.11.2002, MMR 2003, 405; LG Gießen, 4.6.2003, NJW-RR 2003, 1206; BGH, 26.1.2005, NJW 2005, 976; OLG Nürnberg, 10.6.2009, and OLGR 2009, 645), German courts have insistently stated that display of goods in an online shop cannot be treated as offer, of which acceptance through an interactive system would suffice to create a binding contract, and that the contrary view would cause the risk of over-acceptance for the sellers whose stocks might not be sufficient to perform all purchase orders. Hence, without any need for rescission on the grounds of mistake, a mistaken statement of price in such web display cannot be binding for the seller even if the customers have placed purchase orders at that price.

The approach taken by German courts in these “*Computerfehler*” (computer error) cases have been criticized by some jurists like Kimmelmann and Winter (2003), rightly, for not suiting the aspects of online shops. Even in German law it is questionable to treat display of goods with price tags in a self-service shopping store as merely an invitation to offer; and most jurists consider such kind of displays as binding offers (see Hübner 1996; Bork 2015). The same goes for the vending machines (Bork 2015). In the context of purchasing process, it is hard to see any difference between these sales methods and an online shop (Glatt 1998; Muscheler and Schewe 2000). Unlike newspaper advertisements or presentations of goods in shop windows, an online shop provides the customers with the opportunity of access to the warehouse of the seller. In an online shop, usually, the customers can have real-time information on the availability of stocks, be informed of the depleted stocks, and complete all steps of purchasing process by themselves within an automated system pre-programmed by the seller. In a case regarding such an interactive system, justifications like “the risk of over-acceptance” is meaningless.

Judicial opinion in common law jurisdictions is not that clear yet. Nevertheless, the Singapore case of *Chwee Kin Keong v. Digilandmall.com Pte Ltd.* (2005) 1 SLR 502, which also was a website pricing error case, can give a clue about the current tendency. The court dismissed the case which was initiated by six customers who had placed purchase orders through Digilandmall website to buy 1606 laser printers (each worth S\$3854) at a mistakenly stated price (S\$66 for each). However, in contrast to the German cases, the ground for dismissal was not related to the concept of invitation to treat. Relying on the evidence, the Court of Appeal held that the plaintiffs were aware of the defendant’s unilateral mistake and trying to take advantage of it, therefore, the contract was to be found void ab initio. More importantly, in this case, the defendant’s argument that the use of automated e-mail responses does not suffice to form a contract was rejected by the Court of Appeal. The Court has stated that, under Section 13 of the Electronic Transactions Act, an electronic record generated by the defendant’s computer system is attributable to the defendant, since a computer can do so as an “agent” of the company. This detail indicates that, probably, the case would not have been dismissed if the

plaintiffs had not had actual or constructive knowledge of the unilateral mistake of the defendant.

For a commercial website operator, who does not intend to be bound by promise, the existence of an unequivocal and clearly visible disclaimer stating that the displays on the website cannot be regarded as binding offers would be sufficient in any case. The problem is that some of the commercial website operators, who do not want to become bound by their offers, wish to seem as if they were bound by those offers, and therefore, avoid using such disclaimers. This is why the legal results that may arise out of a commercial website display in case of the absence of such a disclaimer should be determined.

First of all, it should be taken into consideration that in the original position of law the concept of “*invitatio ad offerendum*” implies an opportunity for the potential offeror (who has been invited to make an offer) to draft the terms and to bargain. If an “invitation to treat” includes all essential terms of the intended contract and is submitted in a take-it-or-leave-it manner, which leaves no room to negotiate for the one who is invited to make offer, then it is an offer rather than an invitation to treat. Any other result indicates that jurists are trying to do something “artificial.” In the ordinary course of business, customers are fairly right to believe that display of an item with price affixed is an offer to make contract. The approach of considering display of goods with price affixed as invitation to treat is an irregular view which is unnatural to the common sense but adopted to protect some particular interests of the sellers. So, when this view is not required to protect the interests in question, it should be abandoned.

This is certainly the case when goods are displayed for sale in an interactive online shop with statements of price. The customers can complete a purchasing process via an online shop only under a definite scheme, which is pre-organized and run usually by the seller or supplier. There is no room to negotiate on any term of the contract. Purchase orders are placed by using electronic means and patterns that have been pre-arranged by the website operator. Number of items that can be ordered is pre-determined (and usually stated on the website as real-time information) by the seller if necessary. Available payment and delivery options and conditions are predecided by the seller/supplier. It is meaningless to think of the risk of over-acceptance in regard to online shops at which the limits are to be set by the sellers or suppliers. Obviously, the “limited stocks” argument does not correspond with the facts that were subject to the cases in which the decisions have been based on this argument. It should be noted that none of the cases referred to in this subsection was about a shortage of stock. Even in the case of *Chwee Kin Keong v. Digilandmall.com Pte Ltd.* (2005), one can be sure that Digilandmall would not have said no for the delivery of 1606 of printers if the purchasers had been ready to pay (1606 × S \$3854 =) S\$6,189,524.

In cases a commercial website has lesser degree of interactivity, the over-acceptance risk argument seems more proper. A fictional example of these cases has been given by Weber and Volz (2010) as “a pizzeria operating a website through which it receives simultaneous home delivery orders for 1000 pizzas.” It is true that delivery orders exceeding the service capacity of an undertaking can preclude its

operation if they cannot be limited. However, taking the principle of good faith into consideration as the main principle governing pre-contractual relationships, even in these cases it would be proper to say that such an argument should not enable a seller to freely change all the statements he/she made before the receipt of the orders of customers. Rejecting the delivery orders that exceed the service capacity is one thing; doubling the price after receipt of the order is something else. Eisenberg (1994, pp. 1167–1169) has illustrated the case as follows: “Suppose a store advertises 17” Sony TVs at \$350, a customer comes in and says he will buy the TV at that price, and the salesman responds, “We’re not selling the set at \$350, but we’ll sell it at \$400.” The reaction of the customer would not be, as. . . “Of course; I understand; your advertisement was only inviting me to consider and examine and negotiate,” but instead, “You people are liars, cheats, or both.”. . . In the 17” Sony case customer who is told, “We had fifteen of these sets, but they are all gone,” will have a very different reaction than a customer who is told, “We’re not selling the set at \$350, but we’ll sell it at \$400.” As clearly understandable from this example, considering the whole web-offer of the “pizzeria” a nonbinding invitation to treat is not the best approach to prevent the risk of over-acceptance in terms of balancing the interests of the pizzeria and its customers.

Any reasonable customer, who is acting in good faith and fairly right to believe that a web-offer is an “offer” can also understand that this standing general offer is limited to the service capacity or stocks of the offeror undertaking, even if this limitation is not expressly stated. So, it should be assumed that it is implied in a general offer that only a limited reasonable quantity is available and the quantity will be allocated to the customers by the first-come-first-served rule (Eisenberg 1994; Glatt 1998). However, since the quantity of goods in stock or the information of service capacity is not accessible by customers because of the lack of interactivity, the declaration that the order exceeds service capacity of the undertaking or the store is out of stock of the ordered item should be communicated to the ordering customer within a reasonable period of time. Otherwise, it would be proper to deem the trader as bound by the web-offer, since the opportunity to make pre-statements (like “non-binding” or “while stocks last”) not to face such a result is always in the hands of the trader who operates an interactive website which might be considered by customers as an offer (Mehnings 1998; Özdemir Kocasakal 2003).

3.2 *Communication of Acceptance via the Internet*

Manifestation of acceptance of the offer does not suffice to conclude a contract. The acceptance should also be communicated to the offeror (unless acceptance by silence is possible). If the contract is being formed *inter praesentes*, i.e., face-to-face, the offeror has actual knowledge of the acceptance as soon as it is manifested by the offeree. If the parties forming the contract are not face-to-face but the assent is being communicated by a method of instantaneous distance communication, such contract also is deemed to be a contract made *inter praesentes*. If the contract is being formed

inter absentes, i.e., at a distance, and the communication between the parties is not instantaneous, determination of whether and when the acceptance is communicated to the offeror is subject to four theories as follows: declaration (externalization) theory, dispatch theory, receipt theory, and actual notice theory (also called “information theory”).

In Germany, the receipt theory (*Empfangstheorie*) accompanied by limited “information theory” (*Vernehmungstheorie*) is applied. According to this approach adopted in German BGB (*Bürgerliches Gesetzbuch*) § 130 (1), the offeree’s acceptance, in principle, needs (only) to be received (*empfangsbedürftig*) by the offeror to become legally effective, provided that it is communicated by an appropriate method and under circumstances appropriate for the offeror to have knowledge of it by receipt (Bork 2015; Ellenberger 2018; Eckert 2018). The receipt theory is applied in Swiss and Turkish laws, too. According to the “arrival rule” (*Zugangsprinzip, ulaşma kuralı*), which is stated by Swiss OR Article 3 (2) and Turkish CO Article 3 (2), acceptance sent to the offeror becomes effective upon arrival; but the effect is retroactive to the time of dispatch (Swiss OR Article 10 [1]; Turkish CO 11 [1]). An acceptance received by the offeror is timely and effective only when received within a reasonable period of time for acceptance. However, according to another “mixed rule,” even when the acceptance is received too late the contract is considered to be concluded if the offeror must realize that it has been dispatched (properly and) in time, and yet does not immediately notify an intention not to be bound by the contract (German BGB § 149; Swiss OR Article 5 [3]; Turkish CO Article 5 [3]).

The “receipt theory” has also been adopted as the main rule in Articles 18–24 of the UN Convention on International Sale of Goods (CISG) in a manner consisting of a mixture of some of these approaches.

On the other hand, in common law jurisdictions, the dispatch theory applies to the acceptances transmitted by the use of non-instantaneous communication methods [Restatement (Second) of Contracts § 66]. The theory is named as “postal rule” in UK law, and as “mailbox rule” in US law. According to the “postal rule,” an acceptance is considered to be operative when dispatched (e.g., delivered to the Post Office) even if it does not reach the offeror, providing that it has been properly addressed to the offeror and the precautions, which are considered necessary in the ordinary course of business, have been taken to ensure safe transmission.

In the context of electronic contracting, another important expression regarding the communication of acceptance is “risk burden.” When the method of electronic communication, which is required to be used for transmission of acceptance, is determined and imposed by the offeror, the risk of unconscious error in the electronic transmission of acceptance should be borne by the offeror. So, the application of dispatch theory seems proper in these cases. The requirement of acknowledgment introduced by Article 11 of the EC E-Commerce Directive should be deemed as a specific rule that aims to reduce the risk of unconscious error borne by traders. However, contracts concluded by e-mail communication do not fall into the scope of this approach. This is why EC E-Commerce Directive Article 11 (3) states that the requirement of acknowledgement does not apply to contracts concluded exclusively by exchange of e-mail or by equivalent individual communication.

As explained above (in Sect. 2.1), in common law jurisdictions, whether the e-mail is an instantaneous communication is subject to discussion, and since e-mail resembles traditional postal communication the discussion is regarded as directly related to the “postal rule” (e.g., Cummiskey 2006; Macdonald 2013; Mik 2016).

The “postal rule” is a 200-years-old rule which has been applied first in England, and then become widespread in common law jurisdictions (see Perham 1894). The practical reason for implementation of the postal rule, as emphasized in the UK case of *Adams and Others v. Lindsell and Another* (1818), was the need to provide legal certainty for offerees who used to send acceptances under circumstances in which the technologies for distance communication and opportunities for verification of receipt were very limited. Under such circumstances, if the postal rule had not been applied, having no knowledge of whether and when the acceptance has been received by the offeror might have posed a problem of uncertainty for an offeree, especially in case of receiving a notice of revocation of the offer.⁴ But, today, the situation is very different in respect to e-mail communication. First of all, considering the counter-arguments which can be summarized as “not instantaneous, but only fast” (e.g., Mik 2016), it should be emphasized that, though not instantaneous, being “that fast” also would prevent an offeror from revoking the offer within the time period between dispatch and receipt of the acceptance sent by e-mail. Moreover, most ISPs provide e-mail service users with (almost real time) “undelivered message report” if an e-mail cannot be delivered to the recipient. So, an e-mail service user who receives this report would have the opportunity to resend the e-mail of acceptance within the period of time for acceptance and before receiving a notice of revocation of the offer. Obviously, the practical reasons that caused application of the postal rule do not exist in respect of e-mails. As stated by Mik (2016), the real question in respect of electronic communication is about the “risk of communication failure” and “passing of risk,” rather than instantaneousness.

One of the main legal arguments asserted in favor of the postal rule is the argument of “agency” (see Christensen 2001; for a comprehensive list of the arguments for and against the postal rule, see also Winfield 1939). According to this justification, the post office should be considered as the agent of the offeror, not only to deliver the offer, but also to receive acceptance of it. If this is the case, the same goes (*a fortiori*) for contracting via e-mail since ISP of each party is under actual obligation to provide service for that party. Today, in the context of contract formation via e-mail, the argument of “agency” can constitute a basis for “determination of the time of receipt” and “passing of the risk of communication failure,” rather than the dispatch theory. If the communication failure occurs before the message reaches the addressee’s ISP, then it means that the acceptance is not received by the “agent” of the addressee and the contract is not formed. Otherwise, the acceptance should be treated as received by the “agent” of the offeror. When the

⁴In common law, in contrast to civil law system, an offer can be revoked by the offeror at any time prior to its acceptance (see Restatement [Second] of Contracts § 42), provided that the revocation is communicated to the offeree before the acceptance takes effect.

message is received by the recipient's "agent," it is at the recipient's risk. After the "risk of error" passes to the recipient, any communication failure which may prevent the recipient from having actual notice of the message should not preclude formation of the contract.⁵ It should be noted that the opinion of "risk allocation" with regard to communication failures, which may occur during the course of contracting by exchange of e-mails, has been widely advocated by civil law scholars (Ultsch 1997; Süßenberger 2000; Bozbel 2001; İnal 2005; Sağlam 2007; Ernst 2007; for similar approaches in UK law see Law Commission 2001).

4 Conclusions

Each method of electronic contracting can be simply described as follows: E-mail is a method of non-instantaneous communication, which resembles traditional post; online shopping is a method of purchasing which resembles offline self-service shopping; EDI systems are computerized machines which are used to conduct transactions automatically within a pre-arranged framework. As a leading principle, it could be said that the law should always stay close as much as possible to the common sense shared by ordinary people. The "limited stocks" argument that causes an "offer for sale" to be treated as an "invitation to offer," and the postal rule that may cause an offeror to become bound by contract as result of an acceptance which he has never received are approaches contradicting with this principle. These approaches have been justified by some arguments that might be acceptable in the nineteenth century. Today, it is very questionable whether these arguments can still justify the approaches in question, especially in the context of electronic contract formation.

Development of the methods of online contract formation could be an opportunity to reconsider *ratio legis* of some existing legal principles and assumptions in the light of the technological advances. The discussions regarding online contract formation should focus on the reasoning of existing legal principles and theories, and try to prefer the ones most suitable for e-commerce, rather than considering an a priori prevailing theory or principle as per se applicable to also online contracts. But, it is important to note that this view does not necessarily mean establishment of a new legal regime specific to electronic contracts, or support for creation of concepts that are contradicting prevailing legal theories like the "will theory of contract

⁵For a contrary view, see Mik (2016) who argues that, in such cases, the message should be treated as if received only if the terminating device malfunctions due to fault of the addressee. It does not seem proper to think that the sender should undertake the risks caused by malfunction or inadequacy of the mail server or e-mail client benefited by the recipient. An exception may be invoked if the sender already knows or has reason to know the impediment in question. Due to the principle of good faith, another exception could be thought of if the sender is immediately informed of the 'transmission failure' either by an undelivered message report or directly by the addressee.

formation,” which can still be justified by the arguments that were put forward centuries ago.

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Restraint of Trade Clauses in Commercial Agency Contracts: A Comparative Perspective



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Abstract Commercial agency is an important concept in domestic and international trade. Commercial agency is a viable solution for merchants who would like to extend their network of sales and service while cost of a commercial agent is usually less than hiring sales personnel or doorstep salesmen or opening up a branch in a different location. On the other hand, it is always easier and less costly to promote their goods and service in a foreign country for exporters. Several problems may arise after termination of commercial agency contracts. One of these problems is commercial positions of principal (merchant) and commercial agency after termination of contract. Principal has a certain interest in protection of his goodwill and clients while (former) commercial agent may still engage with clients of his (former) principal either on his own account or as a commercial agent of another opponent of (former) principal. Restraint of trade clause in commercial agency contracts can be defined as noncompetition agreements after termination which obliges (former) commercial agent not to compete with (former) principal. Legal provisions regulating restraint of trade clause in several different legal systems are going to be analyzed in our study.

Keywords Commercial agency · Restraint of trade clause · Termination of commercial agency contract

1 Basic Concepts

1.1 Restraint of Trade Clause

Restraint of trade clause is a contractual clause widely used, especially in employment, franchise, license, and consultancy contracts. On the other hand, British scholars group restraint of trade clauses in three groups mainly (Andrews 2011;

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Turner 2014; Elliott and Quinn 2011). Those scholars point out that restraint of trade clauses may be classified as employee restraints, vendor restraints, and agreements of mutual recognition between businesses. Restraint of trade clauses is also known as noncompetition clauses.

Restraint of trade clause may be basically defined as a contractual clause in which one of the contracting parties undertakes an obligation to restrict his/her liberty to carry on his/her trade, business or profession thus restricts competition (Turner 2014). It plays a strange role as it is used a limit to freedom of contract to protect personal freedoms (Smith 1995).

In Common Law, restraint of trade clauses is deemed to be void *prima facie* as a rule, while they are allowed if such restriction is accepted as reasonable (reasonableness of the restraint) (Turner 2014). It means that burden of proof falls on to the party alleging restraint of trade clause is reasonable. This party is usually the party who is employer, principal, or sells his/her business. However, this is not the case in Continental Law. Regarding our subject, European Union Commercial Agency Directive (EEC/86/653) Article 20 expressly states that restraint of trade clauses are valid under certain conditions. As long as contract clause that restricts freedom of formal commercial agent is in accordance with the provision, such clause is not required to be further reasonable. It is also the same case in Swiss and Turkish law.

Conflicting interests are at stake in restraint of trade clauses. A party who wishes to impose restraint of trade clause would have an interest in preventing his/her counterpart from engaging with his/her customers further, even if those customers are led by an agent in the first place (Wacke 1993; Busche 2017). In other words, party who is the beneficiary of restraint of trade clause, would like to stop any business risks that may arise as his/her counterpart (his/her former employee, franchisee, agent, etc.) uses his/her knowledge, experience, and relations with former's customers for his/her sake or offer his/her services to opponent of the former (Wacke 1993). On the other hand, party who is under obligation not to compete has a certain interest in continuing his/her business activities either for himself/herself or for third parties and make use of his/her knowledge, experience, and relations with his/her counterpart's customers (Wacke 1993).

So restraint of trade clauses are only allowed under some conditions in order to protect the party who is under an obligation not to compete, thus compromising these conflicting interests by limiting stronger party who would like to impose such clauses with a higher bargaining power (Wacke 1993; Lucey 2012; Saraç 2012). Basically, former employee, franchisee, agent's legitimate economic interests which conflict with employer, franchisor or principal's legitimate professional interest on his/her goodwill are compromised by allowing restraint of trade clauses with some conditions that limit freedom of contract in order to protect the party with less bargaining power (Turner 2014).

1.2 *Commercial Agent*

There are different ways for entrepreneurs who wish to expand their business activities. They might either set a direct sales network or they might enter the target market through intermediaries (Arkan 2017; Bahtiyar 2017). Entrepreneur may set up a branch or employ sales personnel to sell his/her products or services which constitutes a direct sales network (Arkan 2017; Bahtiyar 2017; Kaya 2016). However, setting up a branch means regular operating expenses while it is similar in employment of sales personnel, i.e., commercial traveler as employing such personnel shall also mean regular expenses. Furthermore, in direct sales network, entrepreneur risks expenses of branch and employment of personnel as he/she is liable even if there is not any commercial transaction concluded with any customer (Arkan 2017; Bahtiyar 2017; Kaya 2016). On the other hand, using intermediaries poses less risk as expenses are usually less and based on the number of commercial transactions concluded with customers (Arkan 2017; Bahtiyar 2017; Kaya 2016). Indirect sales network consists of commercial agency and distributorship options. Thus, it is obvious that commercial agents are important for commercial activities, in particular international trade.

There are different definitions for commercial agents. Nevertheless, it should be noted that these definitions are very similar. According to 86/653/EEC Directive Article 1/par. 2; “For the purposes of this Directive, ‘commercial agent’ shall mean a self-employed intermediary who has continuing authority to negotiate the sale or the purchase of goods on behalf of another person, hereinafter called the ‘principal’, or to negotiate and conclude such transactions on behalf of and in the name of that principal” (European Council 1986). England, Wales, and Scotland, which are Common Law countries, have also implemented this Directive through Commercial Agents (Council Directive) Regulations 1993 and Article 2/par. 1 of this Regulation has the same definition for commercial agents (The National Archive 2018). Please see Randolph and Davey (2010).

Handelsgesetzbuch (HGB—German Commercial Code) Article 84 defines a commercial agent as: “a self-employed intermediary who has continuing authority to negotiate transactions on behalf of another entrepreneur (the “principal”) or to conclude transactions in the latter’s name” (German Federal Ministry of Justice and Consumer Protection 2016).

According to Code de Commerce (French Commercial Code) Article L. 134-1; “Commercial agents are agents who, as independent professionals not linked by contracts for services, are permanently entrusted with negotiating and possibly concluding sale, purchase, rental or service provision contracts for and on behalf of producers, manufacturers, traders or other commercial agents” (Legifrance 2006).

Handelsvertretergesetz [HVG—Austrian Federal Law Concerning the Legal Relations of Self Employed Commercial Representatives (Agents)] Article 1/par. 1; commercial agent “is [somebody] who is permanently entrusted with the intermediation or the completion of [business] transactions, except for immovable property, by another in his name and on his account (hereinafter referred to as

“Principal”) and exercises this activity independently and as a trade” (Austrian Legal Information System 2013).

According to *Obligationenrecht* (OR—Swiss Code of Obligations) Article 418a; “An agent is a person who undertakes to act on a continuous basis as an intermediary for one or more principals in facilitating or concluding transactions on their behalf and for their account without entering into an employment relationship with them” (Swiss Federal Assembly 2017).

According to *Türk Ticaret Kanunu* (TCC—Turkish Commercial Code) Article 102; “(commercial) agent is a person who, as a profession, on a continuous basis and within a specific region, undertakes to facilitate or conclude contracts which is related with a commercial enterprise on behalf of merchant without being entitled as representative with general commercial power of representation, commercial employee or commercial traveler”.

As it may be observed, legal characteristics of commercial agency are more or less same in different legislations. A commercial agent’s activity is either facilitating contracts between principal–merchant and customers or concluding contracts on behalf of principal–merchant (Arkan 2017; Bahtiyar 2017; Kaya 2016; Poroy and Yasaman 2015; Bozer and Göle 2017; Kayıhan 2018; Löwisch 2014). A commercial agent exercises his/her activity independently; he/she has his/her own enterprise, does not take instructions from principal–merchant regarding his/her enterprise and is not an employee of merchant–principal (Arkan 2017; Bahtiyar 2017; Kaya 2016; Bozer and Göle 2017; Ayhan and Çağlar 2017; Kayıhan 2018; Hopt 2018; Löwisch 2014). Moreover, a commercial agent should carry on his/her activities continuously (Arkan 2017; Bahtiyar 2017; Kaya 2016; Bozer and Göle 2017; Ayhan and Çağlar 2017; Kayıhan 2018; Hopt 2018; Löwisch 2014).

2 Restraint of Trade Clauses in Commercial Agency Contracts

2.1 *Interests and Reasons Behind Restraint of Trade Clauses in Commercial Agency Contracts*

Restraint of trade clause following termination of commercial agency contracts is very important to reconcile a certain clash of interest. Without a restraint of trade clause, the commercial agency shall be free to become another merchant’s commercial agent and carry on his/her activities for another merchant in the same market (von Hoyningen-Huene 2016; Busche 2017; Keßler 2015; Can 2011; Poroy and Yasaman 2015; Yılmaz 2011; Emde 2014). In such cases, (former) commercial agent may use goodwill, know-how, and other information, which was gathered during the contract after termination of commercial agency contract. (Former) commercial agent is free to compete with (former) principal–merchant after termination of the commercial agency contract (von Hoyningen-Huene 2016; Hopt 2018;

Roth 2015; Can 2011; Yılmaz 2011; Emde 2014). This poses a threat to principal–merchant’s interests (Poroy and Yasaman 2015). On the other hand, principal–merchant’s this legitimate interest should not lead to a serious restraint of commercial agency’s right to carry on his/her professional activities. In other words, while principal–merchant has a legitimate interest to pursue a restraint of trade for his/her former commercial agency in order to protect his/her clients in the market, (former) commercial agency has a right to continue his/her profession and protect his/her economic independency (von Hoyningen-Huene 2016; Busche 2017; Keßler 2015; Kaya 2016). Thus, legitimate interests of both parties which may clash need to be reconciled by lawmakers (Can 2011).

2.2 *Legislation*

EU opted for a restraint of trade clause following termination of commercial agency contract to be valid but only under certain conditions and limitations (86/653/EEC Directive Article 20). Aim of the Directive is sustaining minimum harmonization. So member states’ legislation may differ. That is the main reason behind different conditions restraint of trade clauses in different EU member states.

HGB Article 90a, Code de Commerce Article 134-14 and TCC Article 123 all allows restraint of trade clauses following termination of commercial agency contract under certain conditions. Indeed, all EU member states except one exception, namely Austria allows restraint of trade clauses after termination of commercial agency contracts (Zelevska 2017). However, Austria opted to forbid restraint of trade clauses after termination of contract in commercial agency contracts. According to HVG Article 25; “An agreement, by which the Commercial Agent is restricted in his [business] work for a period after termination of the contract, is invalid.” So all Eu lawmakers and Turkey opted to regulate the conflict of interest between former principal–merchant and former commercial agency by allowing such clauses under certain conditions, particularly in exchange of compensation for former commercial agency (For German law, see Emde 2014).

There are not any explicit provisions in Swiss Code of Obligations that allow such clauses; however, it is deemed possible by analogy to provisions regulating labor contract (Gautschi 1964; Bühler 2000).

There had been some alterations through codification process of Directive Article 20. All drafts including Commission proposal included payment of a suitable indemnity to commercial agency in cases of restraint of trade clauses after commercial agency contracts (Randolph and Davey 2010). However, this provision is excluded from Directive Article 20 while being enacted (Randolph and Davey 2010). On the other hand, many of the member states including Germany, Ireland, Portugal, Estonia, Hungary, Lithuania, Latvia, Poland, and Slovenia opted to provide commercial agencies with a reasonable compensation in cases of restraint of trade clauses (Zelevska 2017).

Turkey opted to conform its commercial law to then actual EU legislation as an EU candidate with the enactment of 6102 Nr. Turkish Commercial Code in 2012. In accordance with this, TCC Article 123 is adopted from German Commercial Law's provisions. We are going to focus on German and Turkish law while determining and explaining conditions of restraint of trade clauses but we are also going to state important differences within other EU member states.

3 Scope of Restraint of Trade Clauses

3.1 *Personal Scope of Application*

Conditions and limitations regarding restraint of trade clauses after the termination of contract is applicable to both real person and legal person commercial agents (von Hoyningen-Huene 2016; Busche 2017; Roth 2015). Restraint of trade clause after termination of contract is even valid if commercial agent is a minor (Emde 2014; Hopt 2018). Furthermore; authorized dealers, franchisees, and commission agents are also deemed to be included in personal scope (von Hoyningen-Huene 2016; Hopt 2018; Busche 2017). According to *Can*, these conditions and limitations shall be applied to authorized dealers and franchisees by analogy (Can 2011).

3.2 *Time Scope*

Restraint of trade clauses that are concluded before termination of commercial agency contract is valid. In other words, restraint of trade clauses agreed during commercial agency contract is valid (von Hoyningen-Huene 2016; Löwisch 2014; Can 2011; Kaya 2016; Yılmaz 2011). On the other hand, any contract concluded after termination of commercial agency contract does not fall in with scope of provisions regarding restraint of trade clauses as commercial agent is not deemed to be necessarily protected after the termination of contract (von Hoyningen-Huene 2016; Can 2011; Kaya 2016; Keßler 2015; Thume 2014; Emde 2014; Yılmaz 2011). In other words, agreements imposing a restraint of trade after termination of commercial agency contract shall not be subject to conditions and limitations of HGB Article 90a or TCC Article 123.

Indeed, there is no legal and economical bound between (former) commercial agency and (former) principal–merchant after termination of the contract, so that (former) commercial agency shall not feel his/her freedom of contract limited as there is not any dependence between (former) commercial agent and (former) principal merchant (von Hoyningen-Huene 2016; Can 2011). However, agreements regarding restraint of trade clauses concluded prior to commercial agency contract are valid (Can 2011).

4 Conditions for a Valid Restraint of Trade Clause After Termination of Commercial Agency Contract

4.1 Time Limit for Restraint

According to HGB Article 90a and TCC Article 123; restraint of trade clauses should not be longer than 2 years. In other words, contract for a restraint of trade after termination of commercial agency contract maybe for 2 years maximum (von Hoyningen-Huene 2016; Can 2011; Göksoy 2010; Thume 2014; Emde 2014).

Time limit is absolute. It cannot be prolonged with any reason (i.e., Commercial agency's restraint of trade is only limited within duration of a trade fair or commercial agency's disability to carry on his/her professional activities due to illness or oldness) (von Hoyningen-Huene 2016; Can 2011; Emde 2014; Kaya 2016; Bozer and Göle 2017; Göksoy 2010; Yılmaz 2011).

All EU member states except Belgium, Greece, and Luxembourg set time limit for 2 years while Greece and Luxembourg regulated a time limit of 1 year while Belgium regulated a time limit of only 6 months (Zelevska 2017).

Parties are free to conclude a new restraint of trade contract without a limit of time after the end of 2 years. This new contract shall not be subject to conditions regulated in the provisions. On the other hand, duration less than 2 years is valid (von Hoyningen-Huene 2016; Emde 2014; Kaya 2016).

Implementation of restraint of trade clauses begins with the termination of commercial agency contract (Keßler 2015).

4.2 Scope of Restraints

Former commercial agent, who is under a valid restraint of trade, is forbidden to continue to his/her professional activities as commercial agent of third parties within scope of the restraint of trade, as well as conduct the same business with his/her former principal–merchant, be a partner in a partnership company, still partner, partner of partnership with limited liability company or act as member of board (von Hoyningen-Huene 2016; Emde 2014; Kaya 2016; Göksoy 2010).

Kaya (2016) points out that for a commercial agent carrying out activity for different goods or services in a specific location shall only be bound with the restraint of trade clause for only type of goods that his/her former principal–merchant supplies and the commercial agent may carry on with his/her activity for other type of goods while a commercial agent who carries out his/her activity for a certain type of goods or services in different locations may go on with his/her activities for locations outside where the commercial agency contract with his/her former principal–merchant does not cover (Kaya 2016).

4.2.1 Limitation by Geographical Area or Group of Customers

Restraint of trade contract shall only be valid if it is limited by the geographical area or the group of customers (Emde 2014). If a commercial agent is assigned to a specific region or specific group of customers then restraint of trade contract must be limited to that region or group of customers. Principal–merchant must be careful in choosing the type of limitation as in cases where the commercial agent is assigned to a small region, then implementation of the restraint of trade shall be hard (von Hoyningen-Huene 2016). Because, commercial agent shall leave that small region but may still keep in touch with old customers at the same time.

If there is not a geographical limitation and former principal–merchant opts to implement restraint of trade by a geographical limitation, the whole country may be deemed as commercial agent’s area which shall limit the efficiency of the contract and shall be a burden on commercial agencies (See also, Emde 2014; von Hoyningen-Huene 2016). However, in such cases, actual geographical area or group of customers which commercial agency carried out his/her activity should be considered as bounds of the limitation (Kaya 2016).

4.2.2 Limitation by Kind of Goods or Services Covered by Commercial Agency

Restraint of trade clauses may only be imposed for the kind of goods or services covered by commercial agency (Emde 2014). Although wording of Directive Article 20 only mentions kind of goods while HGB Article 90a and TCC Article 123 mentions about subjects both goods and services that fall into scope of commercial agency contract should be understood (Emde 2014).

4.3 Formal Conditions

Restraint of trade contracts must be concluded in written form to be valid (von Hoyningen-Huene 2016; Emde 2014; Göksoy 2010). Otherwise, it shall be void. Inclusion of restraint of trade clause in written commercial agency contract is also valid (Emde 2014; Thume 2014; Kaya 2016; Göksoy 2010; Yılmaz 2011). However, inclusion of restraint of trade clause in a contract annex which is not signed by the parties is void, even if contract annex is mentioned in the commercial agency contract (von Hoyningen-Huene 2016; Thume 2014; Yılmaz 2011).

A document that includes essential points of the restraint of trade contract should be delivered to commercial agency. An exemplar of the document is also sufficient (Kaya 2016; Yılmaz 2011). On the other hand, whether delivery of a copy of commercial agency contract which also includes restraint of trade clause shall be sufficient or not is debated (Bahtiyar 2017). Although wording of HGB and TTK is

vague, it is in the interests of both parties and it shall be easier if handing in a copy of the commercial agency contract that also includes restraint of trade clause is deemed sufficient (Göksoy 2010). If formal conditions are not met (written form, delivery of a document regarding restraint of trade clause), contract is void due to lack of form (von Hoyningen-Huene 2016; Göksoy 2010).

4.4 Payment of a Reasonable Compensation

In Germany, Ireland, Portugal, Estonia, Hungary, Lithuania, Latvia, Poland, and Slovenia legislations, there are provisions for the payment of a reasonable compensation by principal–merchant to commercial agent in exchange of commercial agency’s obligation not to compete (Zelevska 2017). Turkish Commercial Code Article 123 also vests commercial agencies with such rights.

Since this is a right directly based on legislation, restraint of trade contracts shall still be valid even if there is not an agreement regarding the payment of a reasonable compensation (von Hoyningen-Huene 2016; Emde 2014; Thume 2014; Göksoy 2010; Yılmaz 2011). Aim of this right is to protect former commercial agent who is under an obligation not to compete with his/her former principal–merchant and balance interests of commercial agent whose professional activities are limited due to restraint of trade contract.

Legal nature of this payment is not a “compensation” in legal sense despite its name and wording of HGB and TCC (von Hoyningen-Huene 2016; Hopt 2018; Emde 2014; Kaya 2016; Göksoy 2010; Yılmaz 2011). Since there is not a damage here in a legal sense and this payment is quid pro quo of commercial agency’s obligation not to compete with former principal–merchant, it is not considered as a compensation in legal sense (von Hoyningen-Huene 2016; Hopt 2018; Thume 2014; Emde 2014; Yılmaz 2011).

Such compensation may be property or other rights besides money (von Hoyningen-Huene 2016; Thume 2014; Emde 2014; Kaya 2016; Yılmaz 2011). The important thing is the payment to be considered suitable. On the other hand, HGB and TTK do not explain the term suitable. What is considered as suitable is up to the conditions of each case. *von Hoyningen-Huene* states that compensation should not lead to an undue gain for the commercial agent but compensate professional losses of commercial agents brought by restraint of trade clause (von Hoyningen-Huene 2016).

Different criterions such as income of commercial agency during restraint of trade clause, economic importance of restraint of trade clause for principal–merchant, etc. may be used (For detailed information, please see von Hoyningen-Huene 2016). Payment may also be made in installments upon agreement between parties (Emde 2014; Göksoy 2010; Yılmaz 2011). Compensation payment becomes due with the termination of commercial agency contract (Can 2011; Göksoy 2010; Thume 2014).

5 Waiver

According to HGB Article 90a/par. 2; the principal can waive the restraint on trade in writing, up until the end of the agency contract, to the effect that, after the expiry of a 6-month period following such declaration, he/she shall be free of the obligation to pay compensation. There is the same provision in TCC Article 123/par. 2.

Waiver must be in written form (von Hoyningen-Huene 2016; Emde 2014; Göksoy 2010). It must be done until termination of the commercial agency contract, unless parties agreed otherwise (von Hoyningen-Huene 2016; Emde 2014; Göksoy 2010). Waiver has two effects: Commercial agent shall be freed of his/her obligation not to compete (von Hoyningen-Huene 2016). However, principal–merchant has to pay compensation for a duration of 6 months unless waiver is made more than 6 months prior to termination of commercial agency contract.

6 Effect of Termination of Commercial Agency Contract for a Significant Reason on Restraint of Trade Clause

According to HGB Article 90a/par. 3 and TTK Article 123/par. 3, if one of the parties terminates commercial agency contract for a significant reason which can be attributed to the other party's culpa, then same party has a right to announce that he/she is not bound with the restraint of trade contract (von Hoyningen-Huene 2016). Both parties' obligations cease in case one of the parties rightfully announces that he/she is not bound with the restraint of trade clause.

7 Agreements Against HGB Article 90a and TCC Article 123

Any agreements to detriment of a commercial agent, which are against provisions of HGB Article 90a and TTK Article 123 and derive from conditions of restraint of trade clauses regulated in those provisions are considered in the scope of HGB Article 90a/4 and TTK Article 123/par. 4. Simply, any agreement that contradicts HGB Article 90a/par. 1–3 and TTK Article 123/par. 1–3 shall be deemed void to the extent that it is to detriment of commercial agent (Thume 2014; Yılmaz 2011). For example, a restraint of trade clause with a duration of 4 years is contrary to HGB Article 90a/4, TTK Article 123/par. 4 and such clause shall remain valid but for 2 years (Kaya 2016). Another example is a restraint of trade clause for all of the country while commercial agent is assigned to a specific region or city.

Agreements that impose commercial agent to pay back his/her commissions in case of breach of the restraint of trade clause or waiver of suitable payment for commercial agent are also contrary to HGB Article 90a/4, TTK Article 123/par.

4 (Göksoy 2010). On the other hand, penalty for breach of contract or installment agreements for suitable compensation are valid (Emde 2014). On the other hand, it is noted that according to English law, restraint of trade clauses following termination of commercial agency contracts still have to be reasonable and they should not be deemed against public interest (Randolph and Davey 2010).

8 Conclusion

Restraint of trade clauses after termination of commercial agency contracts are contracts which reconcile conflicting interests of former principal–merchant and former commercial agency. While former principal–merchant would like to limit potential competition from former commercial agent, commercial agent’s interest is aimed at carrying out his/her professional activities within same location and same customers. However, commercial agent has a certain right to be protected as his/her bargaining power is less compared with principal–merchant.

EU opted to allow restraint of trade clauses for commercial agents after termination of contracts with certain conditions. Only Austria opted to forbid such contractual clauses. Although payment of a reasonable compensation is sought by many EU member legislations, it is not mandatory according to regulation. On the other hand, any agreements against conditions of restriction of trade clauses are deemed void by member states’ legislations.

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Equalization Demand of the Agent and Its Importance in Business Law



Esra Hamamcioğlu

Abstract One of the most important consequences of the agency contract (commercial agency contract) in terms of its termination is the equalization demand of the agent. After termination of agency contract, the agent may request a reasonable equalization demand if he/she has brought the principal new customers or has significantly increased the volume of business with existing customers. Thus, the principal continues to derive substantial benefits from the business with these customers. Equalization demand of the agent (commercial agent) is regulated on an equitable basis. As of this nature, equalization demand of the agent carries a counter-execution nature for the customer portfolio (goodwill) which the agent acquired and the principal may benefit on its own, depending on the termination of the agency contract that establishes continuing obligation. In this respect, the equalization demand does not have the characteristics of compensation theoretically. However, compared to similar provisions, Turkish Commercial Code Article 122 has some differences and it may also need to be amended to clarify some issues. Objectives of this study are to determine the legal nature, conditions, and calculation of the equalization demand. Furthermore, scope of application of this claim includes other contractual relations giving similar monopoly rights unless it is contrary with fairness.

Keywords Agency contract · Agent · Goodwill · Equalization demand

1 Introductions

Provisions of Turkish Commercial Code regarding agent are taken partly from the German Commercial Code and Swiss Code of Obligations (Ansay and Öney 2014). Turkish Commercial Code regulates agents, although some special status agents are regulated under their special provisions such as insurance agents. According to

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Turkish Insurance Code Article 23/16; the insurance agent may claim compensation from the insurance company if the latter, obtains significant benefits from the insurance agent's portfolio after the end of the contractual relationship and fairness requires so. However, if the insurance agent terminates the contract without a justifiable reason, or if it causes the contract termination due to its own fault, it loses the right for compensation. This provision has been specifically issued in order to fill the legal gap at the time of the repealed Turkish Commercial Code with insurance agencies.

Therefore, as Turkish Commercial Code Article 122 enters into force, we can consider that the reason of the issuance of this provision has disappeared. Also, the latter provision is insufficient compared to Turkish Commercial Code Article 122. Although this provision is a *lex specialis*, judges will apply relevant provisions of Turkish Commercial Code, as they are *lex posterior*, in cases when there is a gap (Ayan 2008). In insurance contracts, acquiring regularly new customers is more difficult than in other industries. Generally, long-term and repeating insurance contracts with the same customers are concluded.

The agent regulated among the provisions of Turkish Commercial Code is an important opportunity which merchant can choose in order to deliver goods and services to a wide range of people. For example, merchant (S) who produces home textile products in Istanbul and sells them wholesale can appoint agent (A) operating in Ankara. Thus, (S) finds the opportunity to transport goods to and around Ankara thanks to (A). In fact, (S) may also open a branch to deliver his goods to and around Ankara. However, opening a branch may be more costly for the merchant in terms of renting a shop to operate and personnel recruitment. Whereas in case of an agreement with an agent in Ankara, without making such expense, the merchant will have the opportunity to present his/her goods to customers in the region where the agent is located, through the agent, who usually owns a commercial business and bears usual costs of this business. The agent will mediate on making contracts between these customers and the merchant, by finding new customers or he/she will conclude these contracts by himself/herself, on behalf of the merchant. He will be entitled to a fee due to his services. Consequently, this commission will be much lower than the costs of a branch.

In this study, we aimed to analyze the application conditions of equalization demand of the agent which has become a positive legal norm with the Turkish Commercial Code Article 122 dated 2012 and to discuss the opinions in the doctrine regarding this new legal provision.

2 Definition and Types of Agent

In Swiss Code of Obligations Article 418a, agent is defined as; an agent is a person who undertakes to act on a continuous basis as an intermediary for one or more principals in facilitating or concluding transactions on their behalf and for their

account without entering into an employment relationship with them (Federal Assembly of Switzerland 2017).

According to German Commercial Code Article 84/1, agent is defined as; a commercial agent is a self-employed intermediary who has continuing authority to negotiate transactions on behalf of another entrepreneur (the “principal”) or to conclude transactions in the latter’s name. A person is self-employed if he/she is essentially able to arrange his/her activities freely and to determine his working hours (German Federal Ministry of Justice and Consumer Protection 2016).

According to Turkish Commercial Code Article 102/1, agent is a person who acts as intermediary in the contracts that concern the business within a specific location or region in a permanent basis and to make these activities on behalf of that merchant, based on a contract without having a legal position connected to the business, such as general commercial power of representation commercial employee, sales clerk or employee of the business.

It would be sufficient to use an expression like “An agent is a person who undertakes to act on a continuous basis as an intermediary” as in Swiss Code of Obligations Article 418a. (See also Kaya 2016).

Agent is defined in the doctrine as follows Arkan (2017), Bahtiyar (2017), Kaya (2014, 2016), İmregün (2001), Poroy and Yasaman (2015), and Bozkurt (2017). Primarily, the agent of the merchant is an independent merchant assistant (Arkan 2017; Hopt 2018; Löwisch 2014). However, the following point should be clarified immediately. The agent arranges his/her activities freely and determines his/her own activity arrangement, working principles such as working hours (Arkan 2017; Kaya 2014; Kayıhan 2018; Emde 2009; Bozer and Göle 2015). The agent himself may also be a merchant.

Agent is not under the control or supervision of the merchant, such as a general commercial power of representation, commercial employee. However, it should not be understood that the merchant will not be able to give any instructions to the agent. In particular, the merchant may give instructions to the agent about the type, content, and conditions of the contract to be made. In some cases, the lawmaker has also made special arrangements for the agent in receiving instructions from his/her principal (Kaya 2016; Arkan 2017; Bahtiyar 2017; Kayıhan 2018; Köker 2017).

The agent acts in the form of mediating with contracts involving a commercial business or concluding them on behalf of the merchant. Turkish Commercial Code mentions two types of agents, namely intermediary agent and agent authorized to conclude contracts on behalf of the principal-merchant. The agent is called intermediary agent when he/she merely acts as an intermediary in contracting of business operations of the merchant, brings the parties of the contract together and merchant and the third party conclude the contract personally.

On the other hand, if the agent is allowed to make contracts with third parties on behalf of the principal-merchant himself/herself, it is named as agent authorized to conclude the contracts (Arkan 2017). As a rule, it is not a condition that agency contract shall be made in a specific form. An agent must be authorized in written form by the merchant in order to make contracts on behalf of the merchant (Turkish Commercial Code Article 107).

According to Turkish Commercial Code Article 107, the authorization document must be registered and announced by the agent. As a rule, the lawmaker has accepted the agent's right to exclusivity. According to this, unless otherwise agreed in writing, the principal may not assign more than one agent at the same time, in the same place or region, with respect to the same line of business. However, as it can be understood from the provision of the law, it is possible to abolish the mentioned right provided that it is done in writing (Turkish Commercial Code Article 104). The agent contract is a contract with continuity (Kaya 2014; Hopt 2003, 2018; Löwisch 2014). Unlike agency contract, there is a temporary relationship in commission contract and brokerage contract (Kaya 2016; Arkan 2017; Bahtiyar 2017; Bozer and Göle 2015). Agency business must be the profession of the agent. In other words, it is mandatory that agency must be carried out professionally (Arkan 2017; Bahtiyar 2017; Kaya 2014; Kayıhan 2018; İmregün 2001).

3 Reasons for Equalization Demand

One of the most important consequences of the termination of the agency contract is the equalization claim of the agent. Indeed, as a result of agent's activity, there will be an expansion in the business of the client (Kaya 2016; Uzunallı 2013; Hopt 2003).

For example, if a business owner based in Istanbul makes A, who is in Ankara, his agent. A's activities will expand the principal's business, in terms of customers. After the termination of the agency contract with A, principal-merchant will continue to benefit from the other customers he/she has acquired in Ankara, resulting from A's activities. However, agent A will not be able to claim any fees from these transactions, even though the merchant continues to operate with the customers he/she has earned. This constitutes a contradiction to fairness. In order to resolve this inequitable consequence which contradicts with the fairness, legislator has regulated the equalization claim of the agent within Turkish Commercial Code Article 122 (Şener 2016).

Turkey opted to harmonize its commercial law with the current European Union legislation as a candidate country with the enactment of 6102 Nr. Turkish Commercial Code in 2012. In accordance with this, provisions of Turkish Commercial Code regarding equalization demand of agent are adopted from German Commercial Code Article 89b and Swiss Code of Obligations Article 418u.

4 Concepts and Legal Characteristic of Equalization Demand

In the judicial precedents and doctrine regarding this concept, there are many different terms such as “*portfolio compensation*,” “*portfolio right*,” “*customer compensation*,” and “*equalization demand*” are used (Kaya 2016; Ayan 2008; Karasu 2008; Badak Aybar 2013; Tekinalp 1998). The main reason for absence of the term unity arises from the issue of whether this claim is a compensation or a correspondence. Different scholars expressed their views on the matter.

Ayan (2008) states that the legal nature of equalization claim of an agent is not a claim for compensation but a demand for a claim pointing out that this claim is not a compensation claim.

Likewise, according to Karasu (2008) equalization claim is a claim made for the equalization of loss incurred by agent due to the fact that the agent will no longer be able to benefit from the customer portfolio after termination of the contractual relationship. For this reason, it is aimed to equalize the disrupted balance against the agent after the termination of the contract, rather than eliminating damage caused by failure to fulfil contractual obligations here and has expressed his/her opinion in the same direction.

According to Kaya (2016), the most important point that separates equalization claim from compensation claim is its purpose. Its purpose is not to compensate the damage caused by defective behavior of principal-merchant. The starting point is that no fee is obtained after the contract expires; however, the fact that the customer portfolio obtained is still used. While the parties benefit from this portfolio at the first stage, once the contract expires, the agent is unable to benefit from this opportunity and loses its right to receive payments. The aim is to make the agent benefit from this continuing portfolio on certain conditions. Kaya (2016), also emphasizes that the equalization demand is not dependent on the faulty behavior of the principal.

In our opinion, there is no question of technical damage here. For this reason, any technical compensation is not the subject. The legal nature of equalization claim of the agent is not a claim for compensation. So in this study, the term “EQUALIZATION DEMAND/CLAIM” is preferred. The title of the Turkish Commercial Code provision is the equalization claim. However, the word “compensation” is also mentioned in the provision. Usage of the term “compensation” is not correct (Badak Aybar 2013).

Indeed, in preamble of the article (official commentary), it was told that even though the word “compensation” was used in the first paragraph, the claim cannot be understood as a claim for compensation for a classical property damage; nevertheless, doctrine adopted the approach that in its broad sense, the claim is directed at the damage compensation.

Waiving the right of equalization demand beforehand is not binding (Ansay and Önay 2014). According to Turkish Commercial Code Article 122/4, equalization demand cannot be waived in advance. It is also accepted in German Commercial Code Article 89b/4 and Swiss Code of Obligations Article 418u.

The reason why this rule was set out is to prevent principal-merchants who are much stronger than the agencies in economical means to force the agent to accept the terms of a contract that is against his/her interests. Even though agent may not waive the right for equalization in advance, he may waive this request after he/she is eligible to use this right (Şener 2016; Kaya 2016; Uzunallı 2013).

5 Conditions of Equalization Demand

5.1 *Expiration of the Agency Contract*

Ground for termination is crucial in terms of equalization claim. According to this, termination of the contract is a precondition for the conditions to be sought (Şener 2016). If the contract is terminated by the agent with a valid reason, equalization claim can be submitted. Likewise, as per Turkish Commercial Code Article 122, it is indicated that if the agent terminates the contract without any action that will make the termination justified, the agency may not demand equalization claim. It is sufficient for principal-merchant to conduct an action that will make the termination justified. Burden of proof regarding that remains on the agent.

In doctrine, with a reference to the German court decisions, late payment, short payment without a valid reason; requesting a report from the agent every week in contradiction with independence criteria of the agent; principal-merchant provoking the agent, causing the agent to terminate the contract are examples for valid reasons for termination of the contract (Karasu 2008).

Termination of the agency contract should happen in a way that will allow a request for equalization demand (Ayan 2008). For the agent to be able to demand equalization claim, the principal-merchant must not have terminated the contract due to the agent's fault. For example, the German courts have accepted insult of the agent to the client or violating the noncompete obligation as faulty action in terms of equalization claim (Karasu 2008; Kaya 2016).

In the event that an agency contract is expired, the agency may demand equalization if other conditions are met. Turkish Commercial Code Article 121/2 should be remembered. According to aforesaid provision, if the agency contract which was made for a certain period of time continues to be implemented after the deadline, the contract becomes indefinite. In this case, since the contract still continues, no equalization may be demanded.

In cases where the agent dies, goes bankrupt, or loses its legal capacity, the contract ends automatically. If the agent is not defective, in case of the bankruptcy, the right to claim shall exist (Kaya 2016; Karasu 2008; Poroy and Yasaman 2015).

5.1.1 If the Agent Is Not Capable of Continuing His/Her Activity Due to Reasons Such as Illness or Old Age

According to German Commercial Code Article 89b/3/1; “The claim to indemnity shall not arise if the commercial agent has terminated the agency contract, unless the conduct of the principal gave justified grounds for doing so, or the commercial agent cannot reasonably be expected to continue his activities on account of his age or of illness” (Bundesministerium der Justiz und für Verbraucherschutz 2016).

There is a similar regulation in EU 86/655 Council Directive. In EU Law, it is accepted that the agent has the right of equalization demand after termination of agency contract on grounds of age or illness of agent in consequence of which he cannot reasonably be expected to continue his/her activities (European Commission 2018).

This provision has not been transferred to Turkish Commercial Code; but in such cases where the continuity of the agency’s work cannot be expected from the agent, the agent must be able to demand equalization (Ayan 2008; Karasu 2008; Kaya 2014, 2016; Akın 2013; Karamanloğlu 2017).

The prevailing opinion in the German doctrine as to whether the agent is obliged to explicitly state the reason for the termination is that the agent does not have to explain that the contract is terminated due to illness or oldness and the may notify the reason for termination later (Hopt 2003; Emde 2009; Busche 2015; Karamanloğlu 2017).

5.1.2 Transfer of Contract/*a Third Party Enters into Contract*

According to German Commercial Code Article 89b/3/3, equalization demand shall not be payable if “a third party enters into the agency contract in place of the agent on the basis of an agreement between the principal and the agent, such agreement cannot be made prior to the termination of the agency contract” (Bundesministerium der Justiz und für Verbraucherschutz 2016).

Although the Turkish Commercial Code does not have a provision regarding this issue agent must be able to demand equalization according to general provisions and principles under such circumstances. The transfer of the contract is usually made for a certain sum of money or in return for benefit. In this case, equalization demand shall not be payable. It would otherwise contradict with fairness (Karasu 2008; Kaya 2014, 2016; Ayan 2008).

5.2 *Other Terms*

In addition to the condition that the agency contract has to be terminated, the law also provides for the following three conditions in order to be able to demand equalization.

An agency contract can be made for a definite or indefinite period of time. An agency contract is terminated when the time period stated in the contract expires (Turkish Commercial Code Article 121; Ansay and Önay 2014). When the agency contract is concluded for an indefinite period either party may terminate it by giving 3 months' notice. But if there are justifiable grounds, the contract may be terminated at any time by sending a notice (Turkish Commercial Code Article 121; Ansay and Önay 2014).

5.2.1 **The Principal Must Be Able to Obtain Significant Benefits After the Termination of the Contract from the New Customers, Brought to the Business by the Agent**

New customer concept is the customer that agent has found and brought to the principal-merchant during the agency contract. There is no explicit arrangement on the increase of volume with "existing customers" in Turkish Commercial Code.

In Germany, the concept of new customer is defined as "if the agent has expanded its business connection with a customer with its effort and if this expansion has an economic value in the sense of a new customer provision, it will be deemed as a new customer" (German Commercial Code Article 89b/1; Bundesministerium der Justiz und für Verbraucherschutz 2016).

Although it is not a perspicuous provision in our opinion, tightening of the relationship and expanding the business volume between the client and the existing customers which the agent did not obtain during its period must also be considered in the concept of new customers (Kaya 2014, 2016).

In this context, selling the same products in a higher volume considering the previous periods, improving the connections between the current customers may be given as examples. Burden of proof regarding this remains on the agent. Whether there is a significant benefit in each concrete case must also be determined. It has been stated in the provision that the benefit should be important (Turkish Commercial Code Article 122/1-a). This condition is criticized in doctrine, and it is stated that the importance of the benefit is in contradiction with fairness (Kaya 2016; Karasu 2008). At this point, benefit conditions will not have been met if the client does not have any significant benefit or the agent's business ends or the agent leaves the customer.

Change in industry may also be considered in this context. Change in industry will be the case when the customer leaves the industry and the principal-merchant ends relationship with the customer. However, accessing same customer from different channels for the same product will not be considered as change in industry.

For example, if the products of a software company are sold through the agent with packages written on CDs to the sub-dealers or consumers, the selling of these software programs to the same customers via Internet after the client terminates the contract with agent will not be considered as portfolio or customer change in terms of this business (Kaya 2016).

5.2.2 Agency's Loss of Commission

By virtue of the fact that agency contract is terminated, the agent must be deprived of the fees that he/she could have earned by means of the contracts that he/she made with the customers or he/she would make within a short period of time (Kaya 2016).

5.2.3 The Equalization Demand Must Not Be Contrary to Equity

According to the existing conditions, the agent may seek reasonable equalization demand if it is on an equitable basis.

Although other conditions in Turkish Commercial Code Article 122 are met, if it is inequitable to pay for equalization claim, the agent shall not be entitled to this claim. The burden of proof that any equalization demand should not be paid or should be paid in lesser amount belongs to the client/principal (Kaya 2016).

With fairness control, it is aimed to adapt the mathematical result obtained by considering the gains of the principal-merchant and losses of the agent with conditions of the concrete case. In cases where principal-merchant gives additional support/benefit to the agent after termination of the contract such as old-age insurance and its rate exceeds or it is equal to equalization claim made by the agent, German and Swiss Federal Courts deemed that giving additional equalization fee is in contradiction with fairness (Kaya 2016).

The role of brand recognition of the product under the agency contract and its attraction power at the discretion of the compensation amount is another issue considered within the framework of fairness. Brand recognition or awareness does not require ignoring the equalization claim. However, the facilitating effect of the sale of well-known brands on the product should not be ignored (Kaya 2016; Badak Aybar 2013).

Pursuant to German judicial decisions, a reduction of 10–30% from the equalization demand to be paid for the sale of well-known branded products would be appropriate. Finally, it is considered that old age or illness of the agent will not play a role in the reduction of the amount (Karasu 2008).

6 Calculating the Equalization Demand

According to Turkish Commercial Code Article 122/2, compensation shall not exceed the average of the annual commission or other payments received by the agent regarding the last 5 years of activity. If the contractual relationship has continued for a shorter period, an average during the continuity of the operation will be taken into account. Using the term of compensation instead of equalization demand is open to criticism.

In preamble of the article (official commentary) it is stated that, to accept that the legal formula expresses the minimum amount in terms of the agent, that another method that will be against the agent will not be in accordance with the purpose of this provision, and however other methods that will make it possible for the agent to claim more may be considered as *ratio legis* within the context of the provision.

The following conclusion can be drawn from the letter and spirit of the law. Unless otherwise determined, the rate in the provision refers to the upper limit in the calculation. However, if the parties agree, they may decide on a calculation basis that allows for a higher amount for the agent (Kaya 2016; Arkan 2017).

Turkish Commercial Code does not set a formula for how to calculate the equalization amount. The equalization amount can be found in a three-step process (Ayan 2008; Kaya 2016; Poroy and Yasaman 2015). In the first stage, the benefit which principal-merchant will make due to new customers which the agent has found (potential benefit) and the potential loss of the agent is calculated. In doctrine, this is called the calculation of the raw provision (Kaya 2016; Kayıhan 2018). In the second stage, it will be checked whether there is a need for discount due to fairness. At the last stage, it is checked whether the amount obtained meets the upper limits prescribed in the law. The arrangements for which the parties have made in favor of the agent are reserved.

7 Period of Submission of the Equalization Demand

According to the Turkish Commercial Code Article 122/5, an equalization claim must be made within 1 year following the termination of the contract. It is argued whether this is statute of limitation or forfeiture period (Badak Aybar 2013; Ayan 2008; Kaya 2016). In Turkish doctrine, Karasu and Arkan accept the 1-year period as a forfeiture (Karasu 2008; Arkan 2017). On the other hand, in Turkish Code of Obligations Article 157/5, it has been stated that demands regarding the receivables arising from the agency contracts are subject to 5-year statute of limitation period.

Kaya (2016) states that this period should be treated as a notice period during the notice of defects and provided that the claim is demanded within 1 year, lawsuits regarding the equalization claim can be filed within 5 years. The 5-year prescription period will begin with the termination of the agency contract. Kayıhan (2018) and Şahin (2016) also think in a similar manner.

The demand for the equalization claim does not depend on any method or form (Kaya 2016, p. 274; Karasu 2008, p. 293; Badak Aybar 2013, p. 181; Kayıhan 2018, p. 197; Şahin 2016, p. 2539). But in terms of proof, it would be useful to demand this claim in writing (Badak Aybar 2013).

8 Applying the Equalization Claims on Other Contractual Relationships That Grant Exclusivity Right

According to the Turkish Commercial Code Article 122/5, this regulation shall also apply to termination of contractual relationships, which give exclusivity rights like exclusive distributor, provided that this application is not contrary to fairness.

Presence of exclusivity right for agency contracts is not a necessary condition for equalization claim. Therefore, Turkish doctrine criticizes the letter of the provision which seeks “exclusivity” criterion for the implementation of the equalization claim in similar continuous contractual relationships (Kaya 2016; Bahtiyar 2017).

Although parties may abrogate exclusivity right in agency contract according to Turkish Commercial Code Article 104 without hindering equalization claim, seeking exclusivity right as an element of equalization claim in similar contracts may not be fair in every concrete case (Bahtiyar 2017). But in this case, Kayıhan (2018), approves the concept of law that seeks exclusive rights as an element of equalization demand.

9 Conclusions

Agency activities are quite intensive in Turkey. For this reason, legislators attach particular importance to equalization demand (Akın 2013, p. 613) and have regulated the equalization demand of the agent within a special provision namely Turkish Commercial Code Article 122.

In the judicial precedents and doctrine regarding this concept, there are many different terms such as “*portfolio compensation*,” “*portfolio right*,” “*customer compensation*,” and “*equalization demand*” are used (Kaya 2016; Ayan 2008; Karasu 2008; Badak Aybar 2013; Tekinalp 1998). The main reason for absence of the term unity arises from the issue of whether this claim is a compensation or a correspondence. Different scholars expressed their views on the matter. In our opinion, there is no question of technical damage here. Therefore, any technical compensation is not the subject. The legal nature of equalization claim of agent is not a claim for compensation.

According to Turkish Commercial Code Article 122, the requirements of the agency’s equalization demand are as follows (Ayan 2008): Termination of the agency contract, should happen in a way that will allow a request for equalization

demand. The principal must be able to obtain significant benefits after the termination of the contract from the new customers who are brought to the business by the agent. The agent should have losses of commission and the equalization demand must not be contrary to equity.

Ground for termination is crucial in terms of equalization claim. According to this; termination of the contract is a precondition for the other conditions to be sought. According to German Commercial Code Article 89/3/1 “The claim to indemnity shall not arise if the commercial agent has terminated the agency contract, unless the conduct of the principal gave justified grounds for doing so, or the commercial agent cannot reasonably be expected to continue his activities on account of his age or of illness” (Bundesministerium der Justiz und für Verbraucherschutz 2016).

Turkish Commercial Code does not have a similar provision. Equalization demand of agent after termination of agency contract on grounds of old age or illness has not been regulated in Turkish Commercial Code Article 122 regarding the equalization demand of the agent. However, in these cases, the continuity of the agent business will not be expected from the agent and the agent must be able to demand equalization claim. Turkish Commercial Code Article 122 is also applied in case the termination of exclusive distributorship contract and other permanent contractual relationships giving similar exclusivity rights, provided that it is not contrary to fairness.

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Commercial Agency Contract and Comparison with Similar Contracts (Exclusive Distribution, Franchising, Brokerage, and Commission Contracts)



Özge Uzun Kazmaci

Abstract The contract between the merchant and the commercial agent is a commercial agency contract. This contract creates a continuing obligation for each party. Commercial agency contract is not defined in any Act but commercial agent is defined in Turkish Commercial Code. However, the provisions regarding commercial agency in Turkish Commercial Code are not sufficient. Therefore, it is important to compare commercial agency contract with similar agreements in order to determine the legal nature of the contract and provisions to be applied to the contract in case of a legal conflict. Agency contracts have some differences and similarities with similar contracts such as exclusive distribution, franchising, brokerage, and commission contracts. Agency contract, unlike brokerage and commission, is a permanent contract. Recognition of monopoly in an agency contract is not a necessary element. However, it is necessary to recognize the monopoly on exclusive distribution contract.

Keywords Agent · Commercial agency contract · Exclusive distribution · Franchising · Brokerage · Commission

1 Introduction

A merchant may choose either to send the subsidiary merchant assistants to new geographical locations, open a branch office or assign a commercial agent (agent) in order to extend his/her market and to increase the demand for his/her goods. The first two options contain disadvantages. For instance, even though the activities of the subsidiary merchant assistants do not result in the merchant's favor, the merchant still has to pay subsidiary merchant assistants' costs and fees. Opening new branches at the locations where the merchant is not currently executing his/her trade activities may also cause new costs. However, commercial agency (agency) is the most

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advantageous way within these three options. Because if the merchant does not earn any profit from the agency activities, he/she is not obliged to make any payments nor to pay any of the costs (Bahtiyar 2017).

The agent is carried out as a professional work activity, not being as kind of a business agent, commercial attorney, salesman, or employee of the employer, under a contract to facilitate or conclude contracts continuously for a merchant regarding operation of his/her commercial enterprise at the determined location or region and conducting all these on behalf of that merchant. The contract between the merchant and the agent is called commercial agency contract. The agent is defined in Turkish Commercial Code, but agency contract is not defined in any Act. Therefore, it is important to determine the legal nature of the agency contract and the provisions to be applied to the contract in case of a legal conflict. In determining legal nature of the contract, it is important to compare it with other contracts. In this chapter, agent and agency contract will be explained in general terms and agency contract will be compared with similar contracts like exclusive distribution, franchising, brokerage, and commission contracts.

2 The Concept of Agent and Its Characteristics

2.1 *The Agent*

A merchant, who wants to enter into new markets and increase the demand for his/her goods and services, can achieve this purpose through an agent. An agent is an independent merchant assistant (Bahtiyar 2017; Hopt 2018; Löwisch 2014).

Under Article 102 of Turkish Commercial Code, a person who takes as a profession the permanent carrying out of negotiation activities for contracts relating to a commercial enterprise or conclusion of such contracts on behalf of such commercial enterprise in a specific place or territory, without having an ancillary role such as a commercial intermediary, mercantile agent, sales clerk, or employee, shall be deemed to be an agent.

European Union Commercial Agency Directive (EEC/86/653) on the Coordination of the Laws of the Member States Relating to Self-Employed Commercial Agents regulated the commercial agency in the Member States of European Union. The provisions of Turkish Commercial Code numbered 6102 related to commercial agents are also based on this Directive (Arkan 2017).

The agent is indeed the independent assistant of a merchant, but he/she is not under his/her control or supervision. Since he/she has his/her own business—which is also usually a commercial enterprise—the agent may also be a merchant, but of course this is not always the case. The agent is not under the command of his/her client merchant (principal merchant); however, in a limited number of cases, the merchant may give him/her instructions. In addition, the agent has also the obligation to inform the client merchant regularly. The fact that the agent is instructed in this way and that the agent is under the obligation to provide information does not

affect the agent's independence (Arkan 2017; Bahtiyar 2017). The existence of a separate business enterprise, determination of the business procedures, and hours by the agent itself (Köker 2017), commercial books, transactions in the trade register, and tax records may give us some clue by the determination of the title of independence.

The agent must pursue these activities as a profession as emphasized in the definition in Article 102 of Turkish Commercial Code; occasional intermediary activities are not considered as agency (Bozkurt 2017). The agency can be performed as the main profession or a sub-profession. Unlike Turkish law, in German law, there are special provisions for agent who acts as a sub-profession (Hopt 2018).

Furthermore, the agent's activity may be in the form of mediating the contract or contracting on behalf of the merchant; activities apart from these are not included in the agency, even if it is concluded in the name of the merchant. For instance, the activities carried out by a drug manufacturer to introduce new drugs to doctors are not deemed to be part of the agency (Arkan 2017). The agent's activities shall be continuous; there is no agent's activity for a single contract (Bahtiyar 2017; Şener 2016). There are two types of agents, namely intermediary agent and agent authorized to conclude contracts.

2.2 Intermediary Agent

The term intermediary agent refers to agents who are engaged in intermediary activities on a regular basis for concluding contracts related to the operation of the client merchant. The intermediary agent finds persons or companies with whom the client merchant will make a contract and directs these persons to make a contract with the client (Kaya 2014).

The agent is obliged to perform intermediary activities. If he/she neglects his/her obligation, then the liability for compensation may arise, or the contract may be terminated as a rightful termination (Turkish Commercial Code Article 121) (Arkan 2017). However, the agent's obligation is to act as an intermediary for the conclusion of the contract, not to ensure the conclusion of the contract (Kaya 2014). Nonetheless, when the contract is not concluded, in principle, the agent does not get paid.

2.3 Agent Authorized to Conclude Contract

The agent who is authorized to contract on behalf of the merchant is called the agent authorized to conclude contract. In this respect, the authority to be given to the agent shall be issued in writing and in a specific form. It is also compulsory to register and publish the authorization document (Turkish Commercial Code Article 107/2).

Pursuant to Article 108 of the Turkish Commercial Code in cases where an agent acts without authority or exceeds the authority granted, the principal may

immediately give consent to the relevant transaction. However, if such consent is not granted then the agent shall be responsible for the transaction on his/her own behalf and account. Accordingly, in case the merchant remains silent and does not give his/her consent expressly for the unauthorized transaction, then it shall be deemed that the consent for unauthorized transaction is not granted. In the former Turkish Commercial Code Article 122, however, the fact that the client remains silent regarding the unauthorized processing meant that he/she approves the transaction. Compared with the provisions of Turkish Code of Obligations regarding representation, this provision emerged as a split provision. Pursuant to Article 47 of Turkish Code of Obligations, not giving consent and remaining silent for an unauthorized transaction implies that consent for unauthorized transaction is not granted. In this respect, provisions on Turkish Commercial Code and Turkish Code of Obligations are now in the same direction. On the other hand, there is still a difference between the present regulation and Article 47 of Turkish Code of Obligations. Pursuant to Article 108 of Turkish Commercial Code, a contract that is not approved will not be void; rather it comes into force between the agent and the third person. However, according to Article 47, unauthorized transactions that are not later approved become void and unauthorized representatives are requested to compensate for damages caused by the voidness of the transaction (Bahtiyar 2017).

3 Agency Contract in General

3.1 Legal Character

The agency relationship arises from a contract between the merchant and the agent (Arkan 2017; İmregün 2001). The agent is defined in Turkish Commercial Code, but agency contract is not defined in Turkish Commercial Code or another Law (Poroy and Yasaman 2015). In Turkish Law, as in German Law, the regulation is oriented around the agency and not the agency contract (Hopt 2018). Agent is one of the independent merchant assistants according to Turkish Commercial Code. Turkish Commercial Code has also some regulations concerning the agency contract, such as rights and debts of the parties and termination of the contract. It is disputed whether these regulations are enough to make the agency contract a specific contract. In this respect, some scholars have been arguing that the agency contract is a special type of proxy contract while others have been arguing that it is a unique contract (Kayıhan 2018). According to one opinion, the agency contract is a typical contract and its essential elements are regulated in the Turkish Commercial Code. Also according to this opinion, the relationship between the agent and his/her client merchant is essentially a client–proxy relationship with significant differences (Kaya 2016). According to another view, the agency contract is a unique contract consisting of the proxy and service contracts (Ayan 2008). An opinion recognizes that the agency contract is regulated as a special type of proxy (Bozer and Göle 2015; Bozkurt 2017). It has also been asserted that the intermediary agency contract is a service

contract, and that the contract which gives the agent an authority to contract is a kind of proxy contract (Domanıç 1988).

In Turkish law, it is disputed whether the agency contract is a specific contract, since the regulation is based on the agent not the agency contract and the definition and essential elements of the contract (for example, whether remuneration is obligatory or not) are not expressly stipulated. On the other hand, it is difficult to describe the agency contract as a special type of proxy, considering the differences from the proxy contract, especially in terms of termination (Kayıhan 2018). In this respect, it may be more accurate to say that it is an anonymous (atypical) contract that also includes the element of proxy contract.

The determination of the legal nature of the agency contract is important in terms of determining the provisions to be applied in case of a dispute. However, the law contains a provision that shed light on this issue. According to this provision, in cases where there is no provision in Turkish Commercial Code regarding the commercial agency, provisions of brokerage contract of Turkish Code of Obligations shall be applied to intermediary agents and provisions of commissioning in Turkish Code of Obligations shall be applied to agents authorized to make contract, and the provisions of the proxy shall be applied in cases where there is no provision [Turkish Commercial Code Article 102/(2)].

The agency contract is a contract that generates continuing obligation (Hopt 2018; Löwisch 2014), since the business that the agent is engaged in is continuous. Again due to the agent's activities, this contract is a service contract (Kayıhan 2018). Agent's remuneration rights for business activity makes the contract a full bilateral (synallagmatic) contract (Kaya 2014, 2016). In consideration of the view that does not consider the remuneration as an obligatory element of the agency contract, contracts where the agent does not request a remuneration may be regarded as incomplete bilateral or unilateral contracts.

3.2 *Form*

The Law does not prescribe any requirement as to form of an agency contract. However, the parties may prescribe a form among themselves (voluntary form) and this form requirement may be the condition for validity or proof (Şener 2016). In practice, agency contracts are concluded in written form of standard contracts. The written form is important for proof (Kayıhan 2018).

If the agent will be authorized to conclude contracts on behalf of the merchant, this authorization must be given in writing and the authorization document must be registered and announced (Turkish Commercial Code Article 107). However, the form condition prescribed here is related to the authority document, not the contract. Likewise, special written permission or mandate is also requested at the Turkish Commercial Code Article 106. Regardless of the form of the contract, the contract on the abolition of the exclusivity (Turkish Commercial Code Article 104) and the

competition contract (after the termination of the agency agreement) shall also be made in writing (Turkish Commercial Code Article 123).

3.3 Rights and Obligations of Agent

3.3.1 Rights

In General

The agent's rights in general are the right to receive remuneration, extraordinary expenses (Turkish Commercial Code Article 117), interest (Turkish Commercial Code Article 118, 120/1,e) and the right of retention until such receivables are paid (Turkish Commercial Code Article 119/1). Since the most important of these rights is the right to receive remuneration, it is worth mentioning briefly under a separate heading.

Right to Remuneration

In the legal definition of the agency, there is no mention of remuneration (Turkish Commercial Code Article 102). Nevertheless, considering the provisions mentioning the remuneration in the Article 113 et seq. of Turkish Commercial Code, the necessity pursuing agency as a career, the fact that the agent has mostly the title of merchant, and the provision of Article 20 of Turkish Commercial Code, the remuneration is considered to be a necessary element in the agency contract (Bahtiyar 2017). However, it is also argued that the agent may give up on receiving remuneration for individual transactions or in general (Arkan 2017).

The agent may ask for remuneration for transactions with third parties that he/she has made or for similar transactions during the course of the agency relationship. In addition, if a particular region or client group has been left to the agent, the agent may also require remuneration for transactions established in his/her territory or in the surrounding area for the duration of the agency relationship, even if these transactions are carried out without his/her own contribution (Turkish Commercial Code Article 113).

The parties can freely decide on the amount of the remuneration. If not stipulated in the contract, the amount of the remuneration shall be determined in line with the commercial practices in the place where the agent is located and if there is no commercial practice, then by the commercial court in that place (Turkish Commercial Code Article 115).

The agent is entitled to receive remuneration as the established transaction is fulfilled and in line with the fulfillment of this transaction (Turkish Commercial Code Article 114/1). Therefore, unlike the dependent merchant assistants, the agent is not entitled to remuneration in case the concluded transaction with the third party

does not enter into force. The agent's right to remuneration is linked to the success of the agency activity. As stated on the rationale of the Article 114 of Turkish Commercial Code, performance of his/her agency act does not directly entitle the agent to remuneration, he/she is rather entitled to remuneration when the contract is executed with a third party. The right to entitlement arises when the contract is executed (Ayan 2008; Kaya 2016). This remuneration is required by law even if the parties have not agreed on the contract. Furthermore, the parties may decide between themselves to pay the agent only for the activity carried out, regardless of the transaction with the third party (Kaya 2014). Remuneration shall be paid within 3 months at the latest from the date of emerging and at the date on which the contract is concluded (Turkish Commercial Code Article 116).

3.3.2 Obligations

In accordance with the provisions of Article 109 et seq. of Turkish Commercial Code, obligations of the agent are mostly arranged in subsidiary nature (Bahtiyar 2017). In accordance with these provisions, the agent is obliged to transact the client's business and protect his/her interests, he/she is responsible for the damage to the property that he/she keeps in the account of the client (Article 109) and shall take preventive measures (Article 111). He/She is also obliged to inform the client of the matters that are of interest to him/her in due time (Article 110/1), to obey the client's instructions, and in case there is no clear instruction on a matter, where it is necessary, transact on his/her own as a prudent merchant (Article 110/2), transfer or deliver the money belonging to his/her client on time (Article 112). Other than these, the agent has an obligation not to compete as a result of the exclusivity right that he/she is granted (Article 104).

3.4 Agent's Representation Authority and Its Scope

We have already mentioned the agent's authority to conclude contract, therefore we will examine here other authority of the agent. Pursuant to Article 105/1 of Turkish Commercial Code, the agent is authorized to receive or make all kinds of statements that protect the rights of the client, such as notices or complaints, related to the contracts that he/she made or for which he/she acts as intermediary in the name of the client.

In order for the agent to accept the price of the goods that he/she has not delivered personally and to take the delivery of the goods that he/she has not paid in person, he/she must be specifically authorized and this authority shall be given in writing. Likewise, special and written authorization is sought for the renewal or the reduction of the amount (Turkish Commercial Code Article 106). However, the expression "renewal" in the Law has been criticized as the "deferral" in the "deferral and

deduction” statements in the former law means the extension of the deferral date, not the renewal date (Bahtiyar 2017).

The agent has also the authority to represent the client in court (Turkish Commercial Code Article 105/2). Accordingly, the agent may prosecute on behalf of the merchant in disputes arising from contracts made or mediated on behalf of the merchant, or may represent him before court. Merchant is bound by verdicts reached at the end of these cases; not the agent (Turkish Commercial Code Article 105/3). However, this last provision is stipulated in terms of lawsuits filed in Turkey. Cases filed in foreign countries have been excluded (Bahtiyar 2017).

4 Comparing Agency Contract with Similar Contracts

4.1 Comparing with Exclusive Distribution Contract

4.1.1 Exclusive Distribution Contract in General

Exclusive distribution contract is an unnamed contract that is not regulated in the Law. With an exclusive distribution contract, supplier is obliged to send all or a portion of his/her products to distributor who will sell these products as an exclusive seller in a particular territory, and distributor (exclusive distributor) is obliged to perform activities aimed at increasing the sales by selling these products under his/her own name and on his/her own account (İşgüzar 1989; Yavuz et al. 2013). Exclusive distribution contract is actually a dealership contract where an exclusive sale right is granted. For this reason, it is also called an exclusive dealership contract (Şenol 2011).

An exclusive distribution contract creates a continuing obligation. It is accepted as a framework contract by the majority of the scholars. Under this contract, distributor is obliged to purchase products from the supplier and pay for them, to perform activities aimed at increasing the sales, to render customer services, to inform, to keep secrets and not to compete. The supplier undertakes to deliver products to the distributor on a regular basis, support (cooperate with) the distributor, and not to violate the exclusivity of the distributor (Yavuz et al. 2013).

4.1.2 The Differences Between Exclusive Distribution Contract and Agency Contract

Exclusive distribution and agency contracts have some common features such as having a continuing obligation, operating in a specific region; however, there are also important differences between these contracts:

Distributor sells the products purchased from the supplier on his/her own name and account, whereas agent does not have the right to make transactions on his/her own name and account (Arkan 2017). The agent receives remuneration for

transactions made or mediated on behalf of the client, due to the work done. Whereas the distributor does not receive any remuneration from the supplier; the price difference of the goods purchased and sold constitutes his/her income (Arkan 2017).

The distributor is more independent than the agent because he/she sells goods on his/her own name and account. The merchant, in a limited way, has the authority to give instructions to agent in certain cases (Bahtiyar 2017). The exclusivity right is not the mandatory element of an agency contract, the parties may agree otherwise, whereas for exclusive distribution contracts exclusivity constitutes an essential element (Turkish Commercial Code Article 104).

4.2 Comparing with Franchising Contract

4.2.1 Franchising Contract in General

Franchising contract is also an unnamed contract that is not regulated in the Law, creates a continuing obligation and is considered to be a framework contract (Gürzumar 1995; Yeniocak 2016). The franchisor is under the obligation to integrate the franchisee into his/her system and to support him/her during his/her commercial activities based on this system by granting the franchisee the right to license to the intellectual and industrial elements involved in his/her own production, operation, and marketing system. The franchisee is obliged to comply with the principles set by the franchisor and included in the system, to sell the goods and services for which he/she is granted the right to use in its own name and account and to pay a certain fee to the franchisor (Gürzumar 1995). According to some scholars, exclusivity is not an essential element of the franchising contract (Martinek 1987; Gürzumar 1995; Kırca 1997; Yeniocak 2016). On the other hand, according to another view, exclusivity is an essential element in the franchising contract (Schulhess 1979).

4.2.2 The Differences Between Franchising Contract and Agency Contract

Although the franchising contract has some similarities with exclusive distribution contract, it has a more complex structure (Arkan 2017). The franchising contract also creates a relationship that has a continuing obligation, such as exclusive distribution and agency contracts. Franchising and agency contracts have similarities in terms of operating in a specific place, increasing the sales of goods and services (Yeniocak 2016; Kırca 1997) but there are also important differences between these contracts.

The franchisee, like distributor, acts in his/her own name and account; does not act in the name of the merchant as agents do (Arkan 2017; Yeniocak 2016; Kırca 1997). While the franchisee can benefit from the commercial and technical know-how of the franchisor, the agent cannot benefit from the commercial and technical know-how of the client merchant (Arkan 2017). As in distributorship, the difference

between purchase and sale price constitutes the income of the franchisee; he/she does not get paid as agent. On the contrary, the franchisee pays the franchisor a fee for using its business name, trademark, promotional marks, commercial, and technical know-how (Arkan 2017).

4.3 Comparing with Brokerage Contract

4.3.1 Brokerage Contract in General

The brokerage contract is defined in Turkish Code of Obligations Article 520/I as a contract in which the broker undertakes to mediate or establish the possibility of conclusion of a contract between the parties, and in the case of the conclusion of the contract, he/she will be entitled to receive remuneration. The brokerage contract considered to be a subtype of the proxy contract and therefore provisions of the proxy contract apply in the cases where there are no special arrangements regarding the brokerage (Turkish Code of Obligations Article 520/II).

The law does not stipulate any form rule for the brokerage contract. However, the brokerage contracts relating to the immovable shall be made in writing (Turkish Code of Obligations Article 520/III). The relationship between the merchant and his/her independent assistant broker is of a temporary nature. In line with this, brokers are not required to make intermediary activities professionally and continuously. The scope of intermediary activity is determined by the contract; this activity may involve merely bringing parties who want to contract together, or may involve participation in contract negotiations and drafting of contracts. However, the brokerage contract does not authorize the broker to make a contract on behalf of the merchant. This requires specific authorization (Arkan 2017).

It is assumed that the broker is not under an obligation to contract (Arkan 2017; Bahtiyar 2017; Kaya 2014). However, if a contract is concluded as a result of intermediary activity, the broker is entitled to receive remuneration (Turkish Code of Obligations Article 521); if the contract is not concluded, the remuneration cannot be requested. However, the parties can agree on the issue that the broker will be entitled to receive remuneration even if the contract is not concluded. If the amount of the remuneration is not specified in the contract, it is determined according to the tariff, if there is no tariff, then to commercial customs (Turkish Code of Obligations Article 522) (Arkan 2017).

The reference to the provisions related to the proxy (Turkish Code of Obligations Article 520/II) ensures that the broker is obliged to observe to rightful interests of the client merchant and has a duty of care and loyalty to client in relation to the intermediary activities of the brokers in accordance with Turkish Code of Obligations Article 506/II (Arkan 2017).

4.3.2 The Differences Between Brokerage Contract and Agency Contract

Broker acts as intermediary for the conclusion of a contract, therefore it is considered to alike to agent. For this reason, when there is no provision in the Turkish Commercial Code, the provisions regarding the brokerage contract of the Turkish Code of Obligations are applied to agency contract (Turkish Commercial Code Article 102/2). The broker and intermediary agents are similar in terms performing intermediary activities on behalf of another person and in particular receiving remuneration (Kaya 2014). The broker, as agent, is entitled to payment only if the contract concluded as a result of intermediary activity. However, brokers such as agents are also not obliged to provide conclusion of a contract. Besides the similarities between them, agency and brokerage are separated from each other by the following differences:

The most important difference between brokerage and agency is that there is a continuing obligation between the agent and the client merchant, while there is a temporary relationship in the brokerage (Bozkurt 2017; Şener 2016). It is not compulsory that broker pursue the activities as career (Kaya 2014).

As a rule, the broker may be associated with more than one merchant while the agent may only deal with a single merchant for the same business. It is not even necessary that client of broker is merchant (Kaya 2014). While the agent is under an obligation to perform intermediary actions, the broker is not obliged to act as an intermediary according to the prevailing opinion (Arkan 2017; Kaya 2014).

4.4 Comparing with Commission Contract

4.4.1 Commission Contract in General

The commission contract was arranged between the Articles 532 and 516 of Turkish Code of Obligations by making a distinction between “commission of purchase or sale” and “other commission businesses.” However, there are special regulations in other laws (commissioning for transportation businesses [Turkish Commercial Code Article 917–930]) relating to certain private brokerage activities. Article 532 of Turkish Code of Obligations defines the purchase or sale commissioning as a contract in which the commissioner undertakes the purchase or sale of negotiable instruments and movable items for his/her name and for the account of the principal.

Since the broker acts on his/her behalf but for his/her proxy account, there is a relationship between the third parties that he/she deals with indirect representation in relation to external relations. In this case, the commission contract is also a contract of proxy that provides indirect representation authority. For this reason, besides the provisions of the Turkish Code of Obligations on the commission contract, the provisions on the proxy contract can also be applied to the commission contracts (Yavuz et al. 2013).

In the purchase or sale commission, the commissioner is obliged to inform the principle about the work done, to insure the contractual article in the case the principle instructs so, to take care of the contractual article, to obey the orders of the principle related to price, not to make sales on account without having the principle's permission, to pay cash by receiving the goods and, in case it is decided so, to guarantee the receivables earned for the proxy's account. In return, the commissioner receives remuneration and also has the right to demand money he/she has paid and for the expenses he/she has made. The law also grants the commissioner the right to sell the goods at auction under certain conditions, the right to retention the fee paid for the goods sold and the goods purchased and the right of self-trading (Yavuz et al. 2013).

4.4.2 The Differences Between Commission Contract and Agency Contract

The commissioner, like agent, has the authority to enter into a contract on behalf of another person's account. However, since the commissioner makes transactions on behalf of his/her client but in his/her own name, he/she has indirect representation authority; whereas the agent makes transactions on behalf of and on the account of the merchant (Seçer 2013). However, as mentioned above, there are special provisions in the Turkish Commercial Code regarding direct representation. As in commission contract, unlike agency, there is a temporary relationship between the parties (Kaya 2014).

5 Conclusion

Agency contract is an agreement between the agent and the merchant. The agency contract is not defined in Turkish Commercial Code but the agency is defined. For this reason, the legal character of the agency contract is discussed in Turkish Law. It is important to compare this contract with similar agreements in order to understand the agency contract. Exclusive distribution, franchising, brokerage, and commission contracts have some similarities with agency contract but there are also important differences between these contracts.

Exclusive distribution and franchising create a continuing obligation such as agency contract. On the other hand, there is a temporary relationship in commission and brokerage contracts. While the franchisee and distributor act in their own names and accounts, the agent, like broker, acts on behalf of and on the account of the merchant. The commissioner, like agent, has the authority to enter into a contract on another person's account but the commissioner makes transactions in his/her own name. So he/she has indirect representation authority. When the agency contract is compared with similar agreements and the features of the agency contract are taken

into consideration, it can be said that agency contract is an atypical contract including the element of proxy contract.

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Women as Perpetrators of Economic Offences in France



Joanna Brzezińska

Abstract Women committed 19,696 economic offences in France in 2003. Among them, 16,755 cases constituted fraud, and 2941 financial offences. In 2008, a considerable increase in the level of crime rate among French female perpetrators was recorded. According to the statistics, women committed 25,364 economic offences (an increase by 28.8% over the period of 6 years), from which 20,733 constituted fraud and 4631 financial offences. The aim of this chapter is to study two issues. The first objective is to identify what factors determine the increase in economic offences committed by women in France and indicate potential methods of reducing the phenomenon studied. The second objective is to determine whether the upward trend is constant or whether it is currently subject to continuation. For this purpose, the research paper shall present compilations of statistics showing the analysis of dynamics of offences committed by women and indicating particular categories of economic offences (particularly fraud and financial offences). It can be deduced that such prompt modification in female perpetrators' behaviour results from social and economic changes that intensified in France in the several past decades.

Keywords Women's crime · French perpetrators · Economic offences

1 Introduction

Although the term women's crime, used to identify a particular category of perpetrators, appeared in France relatively early (at the turn of the nineteenth and twentieth centuries), it is only recently that this phenomenon has been the subject of in-depth interest in French criminology (Agrapart-Delmas 2009). Historical analyses show that women used to be primarily oriented towards "private" crimes, which means that their offences were directed against their friends, relatives and children (Bellard

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2010; Chesney-Lind and Bloom 1997). The fact that women were particularly responsible for crimes against family members caused that they were not always disclosed. In fact, the lower proportion of women perpetrators in the total population of convicted persons was due to the fact of lower level of penalisation of their forbidden behaviours or their milder treatment by the judiciary (men had objections against women being sentenced), and above all because of the high proportion of hidden crimes (abortion, infanticide) which, due to their nature, could be perfectly concealed (Laingui and Lebigre 2000; Naffine 1987). Recent observations by French criminologists show that, as in other European countries, the proportion of women and men in the total population of perpetrators of crimes remains highly asymmetrical. The reasons for this remain diverse and will be discussed further in the study, but the basic comment concerning female perpetrators is emphasised, although their frequency in the implementation of crimes is increasing (Smart 1976; Adler 1975; Heindesohn 1985; Mann 1984), the total number of women in the criminal population is always much lower than the number of male perpetrators, and the crime is still not perceived as connected and stereotypically related to female.

Current analyses of the phenomenon of women's crime in France lead to the following two issues, which are reflected in the characteristics of the phenomenon in question. First, there is a dramatic increase in the number of offences committed by female perpetrators using violence. Aggression is a determining factor in some categories of female crime (murder, robbery, fight and beat), indicating that the image of the female perpetrator is changing. From a mother or wife staying in the area of residence, who has concealed the fact of committing a crime from her external environment, a woman enters the area of social activity, including marking her place in society through conflicts with the law (Bourgoin 2008; Smart 1976).

Observing French society in the context of the accompanying crime, it can be seen that the illegal criminal activity of women is also evolving in a different direction. The radical changes on the labour market and the possibility of participating in its increasingly new sectors have opened the way for women to develop and advance in society (Agnew 2006). French society, which is particularly open to the active participation of women in the various areas of its professional activity, is experiencing certain losses as a result of this activity. It turns out that in the last two decades, the level of economic offences committed by women has increased regularly. Among the economic offences, the predominant type of offence committed by the female remains fraud (National Report of the delinquency 2009, 2011). However, other types of this category of crime are also increasingly being perpetrated by female perpetrators. It seems that the reasons for this situation should be sought in the specifics of the social structure of France. On the one hand, women seek full independence and development opportunities comparable to those of men and, on the other hand, they seek to expand their financial resources even by illegal methods. Women's focus on committing the economic offences is also due to their employment opportunities at different levels of financial institutions (banks, near banks, brokerage houses, credit institutions).

In this context, it is particularly interesting to note that, according to the National Centre for Combating Crime, women in France are primarily the perpetrators of

crimes which are known as “malicious” or “clever” crimes (INHESJ 2012). This category of offences includes the following offences: fraud, abuse of trust and crimes concerning the use of financial instruments (credit cards or cheques). It is still significant that, according to the information provided by the Brigade for the Enforcement of Malicious Crime, located within the structure of the Paris Police Directorate (Franque 2017), this category of crime requires considerable cleverness and ingenuity on the part of the criminals, obviously in a pejorative perspective. In addition, the term “malicious” is primarily used to describe the procedures themselves, i.e. the methods that allow fraudulent conversion. The aim of this study is to indicate which crimes from the category of economic offences are currently the most frequently committed by women in France and what is the trend in the frequency of their realisation.

2 Economic Offences: Characteristics

Since the French female perpetrators continue to be dominated by so-called “malicious” crimes, such as fraud, abuse of trust as well as those concerning illegal financial operations involving financial instruments, below there is a summary of their characteristics in order to identify the most relevant features of the offences most frequently committed by women.

2.1 *Fraud*

This category of crime is one of the offences which is integrated into the structure of “malicious” crime, given that the perpetrator seeks to transfer a specific good to the victim in order to obtain it by means of a trick, fraud or even a lie, and thus uses different methods to obtain it. According to Article 313–1 of the French Penal Code (Code Penal 2002a) fraud is the act consisting in: either using a false name, a false property or abuse of the true property, or the act consisting in using unfair manoeuvres to deceive a natural or legal person or to induce it to do so, as well as conduct aimed at causing harm to a natural person or third parties by transferring funds, values or goods, providing a service or by giving consent to the act giving rise to the obligation or granting discharge. Fraud is therefore committed by means of a range of different types of behaviour, all of which have the same purpose: to carry out a fraud which determines the return of goods from the victim to the perpetrator and which gives rise to a criminal intention on the part of the fraudster, which is required (Lepage et al. 2015; Pradel and Danti Juan 2008). The essence of fraud is therefore that the victim is exploited by the fraudster using methods provided for by the legislator. You can become a fraudster by using lies, by behaving in a dishonest manner or by other malicious methods (Conte 2007). In fact, by exploiting the victim, the fraudster is characterised by the delicacy of its behaviour, not by stealing,

but in fact by inadvertently obtaining the object it wants. The victim therefore becomes a participant in its own prejudice (Rassat and Roujou de Boubée 2008; Ambroise Casterot 2008).

The crime is punishable by 5 years' imprisonment and a fine of 375,000 euros. In the case of occurrence of qualifying circumstances (Article 313–2 of the French Penal Code—Penal Code 2002a), the crime of fraud is punishable by 7 years' imprisonment and 750,000 euros, in the case of fraud committed in an organised criminal association, its perpetrator is punishable by 10 years' imprisonment and a fine of 1 million euros.

2.2 *Abuse of Trust*

In the Ancien French Penal Code of 1992, with regard to this part, which includes regulations on the crime of theft and fraud, there was also an abuse of trust among the trinity of crimes, consisting in the appropriation of the goods of third parties (Article 408 of the Ancien French Penal Code). The abuse of trust required the appropriation of an item originally supplied voluntarily by the victim. In the case of a crime of abuse of trust, the perpetrator of that act regularly maintained possession of the goods. From a criminological point of view, this crime has long been the subject of doctrinal controversy (Ambroise Casterot 2008). The perpetrator of the abuse of trust appeared to be incapable of opposing the charm of the goods it wanted to obtain, and for this reason it was treated as an uncertain owner, who was waiting for the possibility of appropriating it to itself. Today, the perception of this crime in French society is changing (Lepage et al. 2015).

The crime of abuse of trust during the criminal law reform period was of particular interest to the legislator, which contributed to the reform of the former Article 408 of the French Penal Code (Code Penal) and to modify it: It is an act committed by a specific person, consisting in misappropriation/embezzlement to the detriment of third parties, of resources, assets or any goods which were handed to it and which it undertook to return, represent or use in a designated manner. Despite the efforts to reform the structure of the crime of abuse of trust, the legislator has not been able to eliminate its loopholes and Article 314–1 of the French Penal Code (Code Penal 2002b) still raises doubts (Lepage et al. 2015). The essence of the abuse of trust crime is currently the relationship of trust between the perpetrator and its victim. The crime occurs precisely when this relationship of trust is violated. The Code specifies exactly when a relationship of trust arises, and this relationship appears when the perpetrator has resources, values or other legal interests (Rassat and Roujou de Boubée 2008; Dauray Fauveau 2010). Thus, that crime consists in the abuse of trust by the perpetrator not in any manner, but by misappropriating or wasting an object which has been collected with the intention of its return (Conte 2007).

The Legislator penalises the crime of abuse of trust with the penalty of 3 years imprisonment and a fine of 375,000 euros in the case of qualifying circumstances the

penalty rises to 7 years' imprisonment and 750,000 euros, in turn it reaches 10 years' imprisonment and 1.5 million euros, in the case of abuse of trust committed by a representative of the judiciary, a public or ministerial officer, in the case where the crime will be related to the performance of duties or will be committed in the course of performing them, given its nature.

2.3 Other Economic Offences

Other economic offences committed by French female perpetrators include those involving cheques and credit cards. The category of crimes against payment cheques remains very diverse (Conte 2007). This includes crimes committed by the account holder, as regulated in the French Monetary and Financial Code (Article L 163–2, al. 1 and 3—Code Monétaire et Financier 2002a), crimes relating to the issuance of cheques (Article L 131–73, Article L 131–81, Article L 131–82—Code Monétaire et Financier 2002b) and crimes resulting from the issuance of a cheque (withdrawal of commission, defence of transactions related to the payment of the amount for which the cheque is issued, Article L 163–2), as well as crimes of the cheque beneficiary and third parties (Article R 163–1) and crimes related to falsification or forgery of the cheque (Article L 163–6). The basic, but not the only, penalty (which may be higher or lower) provided for in the aforementioned provisions is the penalty of 5 years' imprisonment and a fine of 375,000 euros. The second category of crimes committed by female perpetrators is those concerning payment cards, such as: forgery or falsification of a payment card (Article L 163–3, al. 1 of the French Monetary Finance Code 2002a), French Monetary and Financial Code, using or attempting to use a card or cheque with knowledge of its forgery or falsification (Article L 163–3, al. 2), accepting receipt of payment by payment card with knowledge that it is forged or falsified (Article L 163–3, al. 3). These crimes are punishable by imprisonment of 7 years and a fine of 375,000 euros.

Given that the catalogue of categories of economic offences committed by women remains so extensive, only examples of behaviour which the legislator has deemed dangerous for economic transactions are listed above (Conte 2007). The aim of this study was to define a catalogue of economic offences committed by female perpetrators, which are regulated in the Criminal Code, and therefore, in this point only auxiliary examples of crimes which are specified outside it, in the Monetary and Financial Code, are specified in order to illustrate the multiplicity and diversity of offences committed by French female perpetrators of economic aetiology.

2.4 Specificity of “Female Perpetration” of Economic Offences

The economic offences indicated above are characterised by the occurrence of features in their structure, which prove the use of all kinds of various forms of malicious activity (lies, deception, trick). French criminologists point out that the reason why women are so active in economic offences is because they are able to use behaviour that they find easier than men to use. It is recognised that women are able to integrate their skills in victim manipulation perfectly and adapt them to take advantage of the opportunities available to them to achieve their aims, even if this can only be achieved illegally through crime (Gassin et al. 2011). In addition, it is emphasised that economic or financial offences on a large scale are committed by men, but it is women who are specialists in this category of small- or medium-scale offences. Their effectiveness is high, and their determination and learned methods of obtaining necessary information predispose the female perpetrators to effectively perform them and significantly reduce the ability of law enforcement authorities to detect them (Lucchini 1996).

3 The Analysis of Statistics: French Experiences

According to the research of the International Institute of Crime, in 2008 an extremely high level of economic aetiology crime was recorded in France. As many as 98,940 people have been accused of fraud and other economic offences (abuse of trust, forgery and the use of credit cards and cheques). In this group 70% were men (69,529). At the same time, as many as 25.6% of the total number of accused were women, which means that there were 25,364 of them in the study group; thus it should be stressed that there was a particular overrepresentation of female perpetrators with regard to the total number of crimes.

Taking into account the data presented in Fig. 1, it should be stated that in the observed, relatively short research period (2003–2011), two separate trends can be distinguished, concerning the suspects of economic offences. The first one shows that the number of suspects of economic offences in the years 2003–2008 showed a slight, regular upward trend (from 3.1% to 8.3%). During the 6 years under review, the number of the suspects of offences of economic nature has increased by 27.9%. Meanwhile, after 2008, the trend has changed quite significantly and the number of suspects has dropped significantly in 2009–2010 (analogous to the level recorded in 2004–2005). The question about the reason for this change appears to be important. It appears that the evolution is still conditioned by a multiplication of factors. Among the reasons for the reduction in the number of suspects, one can point out in particular: the increase in the number of normative acts counteracting the indicated economic pathologies and the establishment of financial authorities whose aim is to continue the fight against economic crime (CDGA), as well as tightening up the

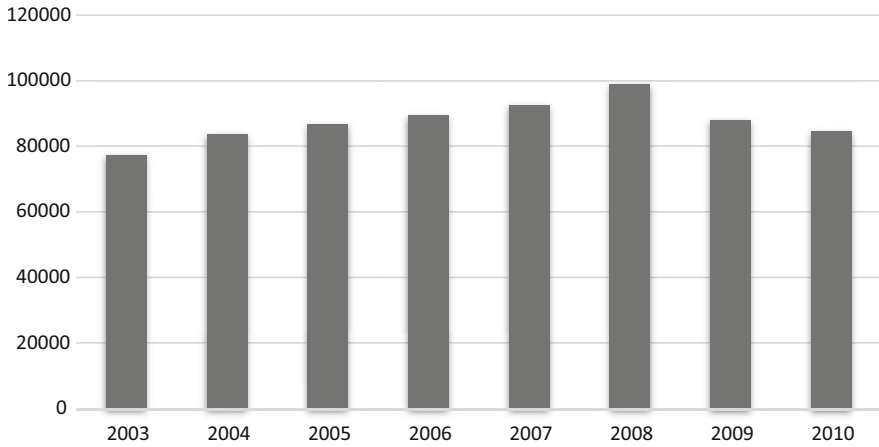


Fig. 1 “Malicious” crimes and other economic offences committed in France (2003–2010) (in total by women and men). Source: National Report of the delinquency (2009), INHESJ (2012)

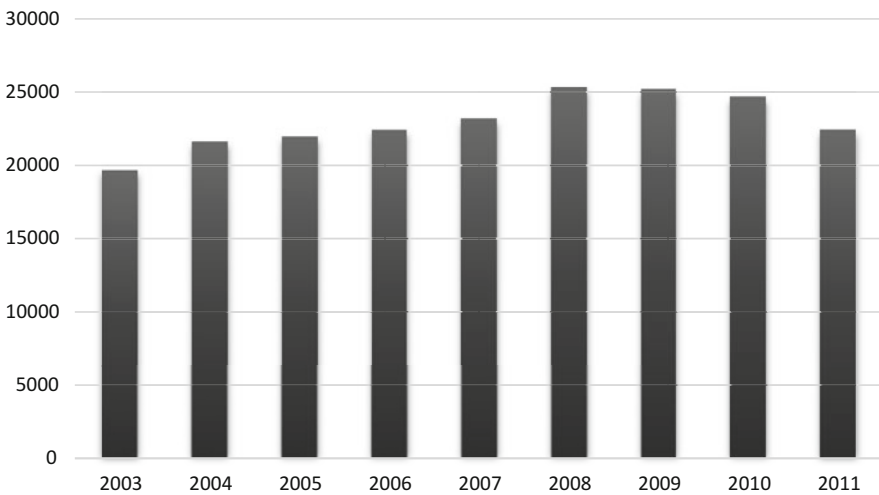


Fig. 2 “Malicious” crimes and other economic offences committed in France (2003–2010) (in total by women and men). Source: National Report of the delinquency (2009, 2011), INHESJ (2012, 2016)

functioning of financial institutions by applying new financial security systems aimed at combating the fraudulent extortion of funds and detecting transactions of suspected unjustified or illegal origin.

With reference to the comments made above on the general trend in economic offences in France between 2003 and 2011 (Fig. 2), to one of the specific categories of suspects—women—it should be stressed that this general trend is being extrapolated to the area of female crime. As in the case of the total number of suspects

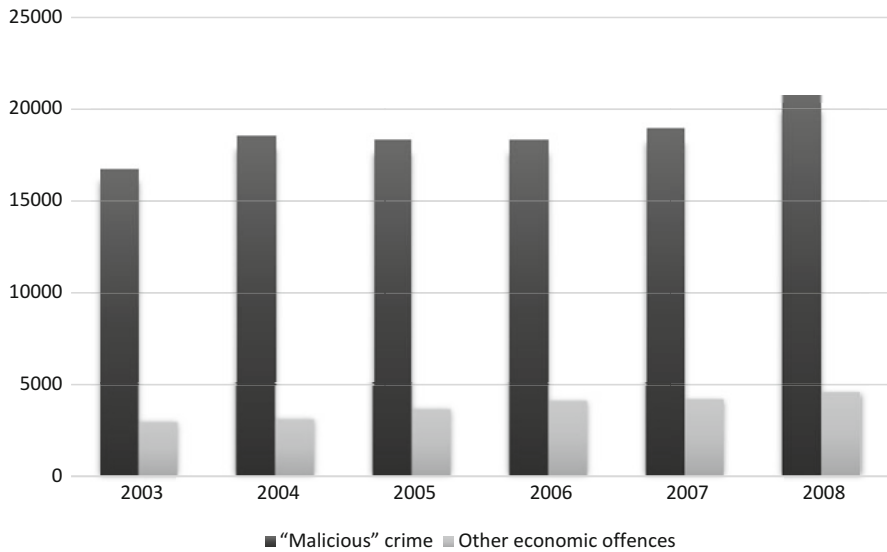


Fig. 3 “Malicious” crimes and other economic offences committed in France (2003–2010) (in total by women and men). Source: National Report of the delinquency (2009)

(including both men and women), the initial upward trend in the number of women suspected of economic offences continues between 2003 and 2008 and then evolves towards a decline in the number of suspects between 2009 and 2011 (Fig. 2).

Figure 2 shows that between 2003 and 2008 women were suspected of having committed 134,387 economic offences. Their lowest activity was in 2003, when they were suspected of committing 19,696 offences, while the optimum number of women suspected of economic offences was in 2008, when 25,364 of them were recorded. An increase in the number of suspects over the six analysed years was at the level of 27%. This means that the number of women suspected of economic offences has risen by almost one-third in 5 years. Since 2009, there has been a slow, regular decrease in the number of suspects of committing this category of crime (from 25,237 to 22,461 of suspects). The decrease in the level of suspects in comparison with their maximum number in 2008 was at the level of 15%.

Figure 3 presents the crimes committed by women in France between 2003 and 2008, distinguishing their individual categories. It is interesting to note that there is one trend in the dominant category, which includes so-called “malicious” crime, as well as in other crimes. It can be observed in the analysed period that all crimes committed by women with economic aetiology are dominated by a permanent upward trend. In the case of so-called “malicious” crime, which covers several basic categories of crime (fraud, abuse of trust, or other falsification of financial instruments), the upward trend is less regular (from 16,755 in 2003 to 20,733 in 2008), given their level recorded in 2004. Meanwhile, the full regularity of the trend is observed in the case of the categories of other economic offences (from 2941 in 2003 to 4631 in 2008). The value of the data presented is even more important from

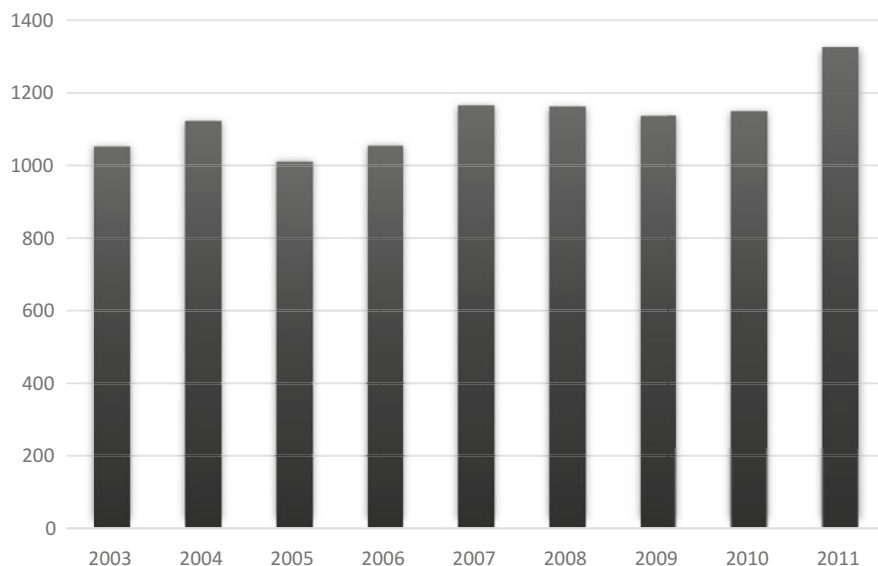


Fig. 4 “Malicious” crimes and other economic offences committed by minor female perpetrators. Source: National Report of the delinquency (2009), INHESJ (2012)

another point of view. Figure 3 shows that the core of female crime in France is offence, which focuses on so-called crime of the malicious nature.

Importantly, by focusing on the issue of determining the level of increase in the frequency of crimes committed by women, another regularity can be observed. In the period of 2003–2008, a 29% increase in the frequency of “malicious” crime and a 57% increase in all other economic offences committed by female perpetrators were recorded. This observation therefore shows that the predominant category of economic aetiology offences committed by women is that of malicious nature (a total of 111,756 cases of fraud and abuse of trust), while a higher rate of increase is observed in the second category of crimes, which includes all other offences of this category (more than 50%).

In contrast to adult perpetrators of economic offences, minors practically do not commit offences of economic nature. In 2011, the underage female perpetrators constituted a group of 1327 girls (Fig. 4), which, in comparison with the underage male perpetrators—2437, made it possible to notice that their position was much weaker in this category of perpetrators (INHESJ 2012). Observing the trend of the participation of minor girls in committing economic offences, it may be concluded that in the years 2003–2011 there was a relatively constant tendency of their incidental participation in the implementation of the features of the analysed acts (between 1012 and 1167 cases). Some noticeable breakthrough in the criminogenic activity of girls was observed only in 2011, allowing to indicate a higher participation of girls in the analysed category of crimes by nearly 22%. Much more

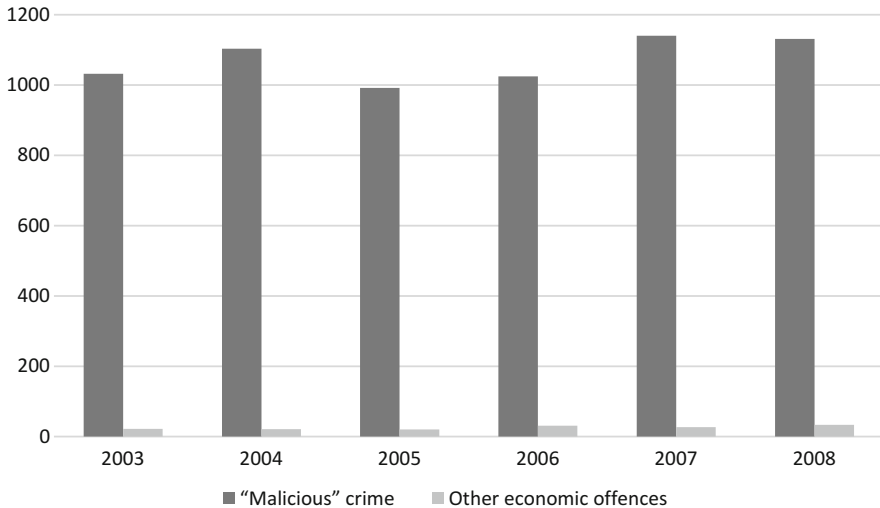


Fig. 5 Types of economic offences committed by minor female perpetrators. Source: National Report of the delinquency (2009), INHESJ (2012)

frequently, but also rarely, underage boys are involved in economic aetiology offences (for example: 2875 in 2009, 2707 in 2008 and 2575 in 2010).

In the analysed research period 2003–2011 the number of minors suspected of committing economic offences evolved. There can be no single sustainable dominant tendency among young women perpetrators, although the frequency of the offences of which they were suspected, has increased over the decade. The lowest number of suspected minors was recorded in 2005 (1012) and the highest in 2011 (1327). Therefore, it can be observed that globally the number of economic offences suspects among minors has increased by nearly 30% in the analysed decade. As shown in Fig. 4, the number of minor female suspects was slightly above 1000 between 2003 and 2006, before reaching a level of above 1100 cases per year between 2007 and 2010. Therefore, the main upward trend in the period considered only started in 2011, when more than 1300 cases of minor suspects were recorded. Therefore, the increase in the number of minors was initially at the level of 10% between 2003 and 2006, and then between 2007 and 2010 it increased by a further 20%.

In Fig. 5, out of the various categories of economic offences, minor female perpetrators (similarly to adult female perpetrators) are suspected primarily of committing “malicious” crimes. Although the frequency of implementation of their features varied slightly in the analysed period from 2003 to 2008 (from 992 suspects in 2005 to 1140 in 2007), the discrepancy in the number of suspects was not significant (approximately 16%). It is particularly interesting that among the catalogue of economic offences, minor female perpetrators are most often suspected of committing a crime of fraud (with a low frequency of its implementation, however). The following data may lead to the conclusion that the frequency of

other types of economic offences among underage girls is practically incidental (in general, it is still in decline), ranging from 22 to 33 cases of suspects. Thus, it seems reasonable to state that minor girls rarely become perpetrators of economic offences; however, when they decide to commit them, they should be considered only to commit fraud. A similar trend can no longer be observed in the case of minor economic perpetrators, since, firstly, their frequency of fraudulent activity is higher than that of girls (from 2558 in 2008 to 2191 in 2005), by almost 46%. Moreover, they are more likely (though not drastically likely) to be suspected of committing other economic offences (from 348 cases in 2007 to 120 in 2003). Therefore, it can be concluded that the overall disproportion between minors suspected of committing a crime of fraud and other economic offences remains as high as that of girls, but for minor male perpetrators the overall participation in all other economic offences apart from fraud is higher than incidental (they are more likely to be suspected of having committed them).

4 Conclusions

The crime methods are changing and evolving together with the business and economic development of each country. With the emergence of new socio-economic phenomena, new categories of crime also occur. Women are increasingly active in the field of crime. This article refers directly to the issue of implementation by the female perpetrators of new categories of economic offences, which they committed in France between 2003 and 2011. The presented research provides the basic statements.

Women in France have been guilty of various types of offences of economic aetiology. They have committed crimes of fraud, abuse of trust, dealing and the use of illegal payment instruments (in particular credit cards and cheques) for which criminologists have found a common denominator. It should be pointed out that French female perpetrators of economic offences are most likely to commit so-called “malicious” offences. They use deception, lies and tricks in their activities; they do not retreat from these practices in order to achieve satisfactory material benefits. It is stressed that the scale of their acts does not concern the so-called serious economic crime. This is still the domain of men, but women increasingly use their positions and functions efficiently to commit minor or “medium” crimes, which they precisely plan. Their personal abilities, inseparably linked with gender stereotypes, allow to state that women are naturally predisposed to enforce undue values or goods without arousing anxiety. What is worrying is the fact that, with the economic development of the French State, the methods of activity of the French female perpetrators are also evolving, becoming increasingly sophisticated and difficult to detect even by specialised law enforcement authorities (e.g. the BRDA).

As the results of statistical analyses presented in the research show, French female perpetrators most often commit economic offences of a “malicious” nature. Therefore, their activities remain targeted at fraud, abuse of trust and certain crimes

involving payment instruments. In the analysed period 2003–2008, the frequency of implementation of this category of crimes increased by nearly 30%. At the same time, other crimes of economic aetiology constituted a category whose dynamics was increasing (in the years 2003–2008 their increase was 56%), although the frequency of their implementation by female perpetrators was four times lower than that of crimes of “malicious” nature (20,733–4631 in 2008). According to the presented research, until 2008 there was a continuing trend indicating a regular increase in the frequency of activity of French female perpetrators in the field of economic offences, and in the years 2009–2011 there was a slow decrease in criminogenic activity among the female perpetrators of the analysed category of offences. Importantly, with regard to the age category, it should be stressed that younger women also choose to implement the feature of this category of crime. As in the case of mature women, but on a much smaller scale (maximum 1327 cases in 2011), girls are mainly involved in the crimes from the category of “malicious” nature. However, their activity in the area of other economic offences is incidentally formed (about 20–30 cases on a yearly average). Moreover, a certain element differing these two categories of women is the persistence of the upward trend in the illegal activity of minors in the area of economic offences, which has continued since 2003.

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Criteria for the Proper Management of Public Property and the Control of Public Procurement



Jan Gola

Abstract The aim of the chapter is to indicate how the criteria of proper management of public property affect the control over granting public contracts and the consequences of their non-application. This chapter deals with the control of public procurement in the European Union, which is directly related to the issue of proper management of public property. The entity granting the public contract should take into account criteria such as legality, cost efficiency, purposefulness, and reliability. The entire area of exercising the property rights of the state and other public and legal entities by public authorities is subject to control in these areas. It should be pointed out that these should be directives for the authority that grants the contract to act in the management of public property in the public interest. Moreover, it should be stressed that proper management of public property is carried out by a number of provisions of public economic law, which set out best practices for public authorities in this area and constitute a reference point for control and supervision activities undertaken with respect to appropriate bodies possessing public property. The criteria indicated have an impact on savings in the spending of financial resources, which are the responsibility of the public sector in a broad sense, and on the creation of foundations for the use of economic shares by entrepreneurs on the public market. In the chapter, a research formal-dogmatic method and a functional method of analysis were applied.

Keywords Purposefulness · Reliability · Cost efficiency · Public procurement · EU · Polish law · Social market economy

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1 Introduction

Public supervision of the public procurement market in the European Union is connected with the issue of proper management of public property. It should be pointed out that the public authority granting the contract should take into account such criteria as: legality, cost efficiency, purposefulness, and reliability. In a democratic country governed by the rule of law—in a social market economy—the entire area of public procurement is subject to supervision (including control) at the abovementioned juridical levels. It should be pointed out that these should be directives for the authority that grants the contract to act in the management of public property in the public interest. Moreover, it should be stressed that proper management of public property is carried out by a number of provisions of public economic law, including public procurement law, which set out best practices for public authorities in this area and constitute a reference point for control and supervision activities undertaken with respect to appropriate bodies possessing public property (Flynn and Davis 2014). It is important to bear in mind that public procurement currently forms an important part of the market in economic terms (part of the free market economy). The significance of this part of the market is determined by the constantly growing value of granted contracts, which makes obtaining them the basic way of functioning in the economy for some entrepreneurs. This situation exacerbates competition on the public procurement market, encouraging corrupt behavior aimed at winning contracts. Ensuring proper control in the public procurement sector should be a measure to reduce this negative phenomenon.

The indicated criteria have an impact on savings in the spending of financial resources, which are the responsibility of the public sector in a broad sense, and on the creation of foundations for the use of economic shares by entrepreneurs on the public market. It is worth mentioning at this point that proper management of public property is undoubtedly a factor which has a positive impact on the reduction of pathologies in the sphere of public administration. It is only by introducing clear criteria that one can contribute to the proper functioning of the public procurement system in a given country. The aim of the chapter is to indicate how the criteria of proper management of public property affect the control over granting public contracts and the consequences of their non-application. Formal-dogmatic method is the basic research method used in the publication. It allows the content of existing legal norms (including the rights and obligations of public procurement authorities), as well as the principles (whether directive-based or descriptive) on which they are based, to be determined. A functional method of analysis, which allowed to examine the law in action, was also considered. Motivation behind the chapter was a low awareness and understanding of criteria of public property management, which impact the functioning of the public procurement system in the European Union. The following sections of the chapter are: Criteria of Proper Management of Public Property, Control of Public Procurement and Application of Criteria for Proper Management of Public Property, and Conclusions.

2 Criteria of Proper Management of Public Property

The aspects of one of the specific principles of public economic law, namely the principle of proper management of public property, should be presented at this point. One may state that it is one of the fundamental juridical assurances for the functioning of the social market economy (Zimmermann 2017). Its transparent *de facto* criteria contribute to a reduction in the prevalence of pathologies in the public sector. The very issue of public property is highly complicated. The doctrine of economic law often uses such notions as property, assets, or public property incorrectly, interchangeably. Undoubtedly, this third phrase should be considered as correct and most appropriate for the Polish legal system. Public property has a specific, instrumental character, which is strictly conditioned by the public interest. For this reason, the precise definition of the types of public property is a very important issue in terms of doctrine, judicature, and practice (Gola and Klich 2013). There are three main categories of public property: common property, property serving the administration, and fiscal property.

The first is common property. It includes all items intended for common use, which can be used by everyone on an equal basis, and the manner of using this property is determined by the provisions of administrative law. Property serving administration (administrative property) is property serving administrative purposes to ensure the functioning of state and local government agencies, as well as to perform public administration tasks. Another category includes fiscal property consisting of property and property rights constituting a source of revenue for public entities intended for the performance of their tasks. The purpose of the property is to generate income which constitutes a material basis for the proper functioning of public administration in meeting public utility needs (Guziński 2009). Public property is also understood as certain property and assets vested in the State Treasury or other state legal persons, and as property vested in self-government entities, used directly or indirectly to perform public tasks (Gola and Klich 2013). This distinction is based on the subjective criterion (the entity to which the property belongs) and the functional criterion (the use of property in the public interest). Within the property, a distinction is made between items serving the general interest by bringing benefits from economic activity (production property) and property allocated in a legal manner for public use, serving to ensure the functioning and fulfillment of noneconomic tasks by public entities (nonproductive property) (Guziński 2009).

The principle of proper management of public property, as well as other specific principles of public economic law, has been identified through the use of inductive reasoning. It consists in observing the scope of this right's interference in the sphere of economic life, defining the spheres of this interference and, finally, ascertaining the rules governing this interference, so that the entire area of exercising the property rights of the state and other public law entities by public authorities is assessed according to the criteria of legality, economy, reliability, and purpose. These criteria should be directives for public authorities to act in the management of public property in the interest of public authorities (Kiczka 2009). They have been adopted

by the legislation of many European countries and should also be respected in the context of public market surveillance of public procurement. It is also worth noting that public property itself has a specific, instrumental character, which is strictly conditioned by the public interest. The most important and instructive for the issue of anti-corruption prevention areas of legal regulation of the management of public property I considered the following: legal regime of public procurement, public and private legal regulation of the organization, and functioning of companies with the participation of public entities (Eliasson 2010).

The meaning of the above criteria has been explained by the Polish Supreme Chamber of Control, which in its opinion considers legality to include the examination of compliance with the generally applicable law, acts of internal lawmaking, agreements, decisions issued in individual cases, and other decisions taken by authorized entities. The first criterion—legality—includes the assessment of the compliance of the measure with the generally applicable law, acts of internal lawmaking, agreements, decisions issued in individual cases, and other decisions taken by authorized entities (Supreme Chamber of Control 2003). Cost efficiency includes the assessment of a given state of affairs in the light of the requirement of economical and effective use of funds, obtaining an appropriate ratio of outlays to effects, using the possibilities to prevent or limit the amount of damage incurred in the controlled entity (Banaszak 2009).

The purposefulness includes the assessment of: compliance with the objectives of the audited entity; optimization of the methods and means used; suitability for achieving the objectives set; and achievement of the objectives set (Supreme Chamber of Control 2003). Two types of purposefulness can be distinguished (Skrzydło 2001): objective purposefulness, which means, on the one hand, checking whether the outlays incurred during the operation of the controlled entity have produced the maximum possible results (maximizing the effect), and methodical purposefulness consisting in the accurate selection of the method of achieving the intended objective (Banaszak 2009). Reliability refers to the assessment of the performance of duties with due diligence, the observance of the internal rules of operation of a given unit, the documentation of certain actions or facts in accordance with reality, in an appropriate form and within the required deadlines, without circumventing certain facts or circumstances (Chełmoński 2009).

These criteria should be directives for public authorities to act in the management of public property in the public interest (Gola and Klich 2013). At this point, it should be noted that the rule in question is implemented through public law regulations (especially financial law), which set out models of behavior for public authorities in this area, providing a reference point for control and supervision activities undertaken with respect to relevant authorities holding public property (Chełmoński 2009). Such models are contained, e.g., in the Polish Act of 29 January 2004—Public Procurement Law. The main objective of this legal act is to ensure efficiency and savings in the spending of funds under the responsibility of the public sector in a broad sense (Horubski 2009), so the aim is to prevent the spending of public funds in any way and the occurrence of pathological phenomena in this area.

3 Control of Public Procurement and Application of Criteria for Proper Management of Public Property

One of the main reasons for the emergence of pathologies in the public procurement system all over the world is insufficient substantive preparation and lack of the necessary professional preparation of people involved in the preparation and conduct of public procurement procedures (Wiśniewski 2006). This pathology has a negative impact on the management of public property, and thus on the state finances. Due to the discretion of the direct awarding entities, there is a risk of conflicts of interest and other pathologies, such as corruption (Georgieva 2017). However, in a well-functioning public sphere, these pathologies are rejected and socially unacceptable and in a democratic state governed by the rule of law they should be rejected. It is also worth mentioning at this point that these pathologies threaten the legitimacy of the activities of public administration bodies, as well as the safety of citizens. The indirect consequences of this may therefore be a lack of respect on the part of citizens for public institutions and their lack of conviction of equality before the law.

The functioning of public administration may, on the one hand, depend on the organization of the control system and, on the other hand, on the knowledge, skills, and moral qualities of the employees who operate within it. Modern administration cannot be achieved without well-functioning clerical staff, and the very care for its quality should be perceived as a separate public task for which the state should be responsible. It should be remembered that equal pathologies can be fostered by the very organization of public administration, which, by its complexity and bureaucracy, will force citizens to seek paid protection, arrangements, and bribes. This shows that well thought out and simplified system solutions in the field of public administration, based on the principle of subsidiarity, also have a preventive function.

The prevalence of pathologies, their persistence, and their degrading impact on the functioning of state structures, on the activities of public institutions and on people-to-people relations often lead to the search for remedial measures against this phenomenon. It should also be remembered that the state of social imbalance caused by pathologies weakens social bonds, the system and values of social norms and deregulates the mechanism of social control. This state is aggravated in a period of uneven economic, social, political, and cultural development (Jarosz 2004). I believe that legislation, penalization, transparency, and transparency of the activities of public officials—including in the area of public procurement—are important in preventing these pathologies (Askari and Rehman 2010).

It should be noted here that public property is characterized by the need to ensure its special protection and to control its proper management. The reason for this is the instrumental nature of the property. They should therefore be given special protection, as only if they are managed properly can the administrators of these properties effectively carry out their public tasks. It is recognized that the property of the State Treasury and local government units should not be identified with private property, because the specific nature of property rights of public law entities, determined by

the public interest, makes it possible to experience greater limitations of those rights than property rights of other entities.

People involved in the management of public property shall exercise the utmost care in the performance of their duties of administration in accordance with the purpose for which the property is intended and shall protect the property. It should also be remembered that the provisions of the Civil Code, which regulate debt collection, compensation claims, and property claims, apply to the protection of public property (Gola and Klich 2013).

In view of the importance of public property, public oversight of the public procurement market is essential in democratic legal systems. Representatives of the doctrine of public economic law point out that proper actions within it are conducive to preventing pathologies in the spending of public funds and they are conducive, as mentioned earlier, to the existence of regularity in the sphere of management of public property, which should be based on the principles of legality, cost efficiency, reliability, and purposefulness. It is therefore important that the authorities responsible for supervision have an adequate degree of independence and that only then will their actions not be subject to inappropriate restrictions which would not achieve the intended objectives. In this part of the chapter it is worth pointing out that the very structure of supervision over the public procurement market should contain such elements as: supervisory functions; supervisory tasks; supervisory duties; the legal status of the supervisory authorities; and verification (including judicial verification) of supervisory duties.

Supervision means control combined with the possibility of interfering in the activities of the body subject to supervision. It means the assessment of the activities of an administrative body, combined with the possibility of assistance, influence, or modification by an organizational or functional superior, to ensure that those activities are lawful and, where appropriate, that certain specific values, which are also laid down by law, are complied with. The most instructive categories of supervision include: day-to-day (behavioral) supervision, and preventive (precautionary) supervision. In addition, among the basic types of supervision, the representatives of the public doctrine of economic law also include regulatory supervision and police supervision. It is also worth mentioning: supervision of substantive administrative law, and supervision of the administrative system (Szewczyk 1995).

It should be stressed that in terms of the subject of the chapter, it is important to note that in the case of public procurement law regulations, supervision depends on the legal status of the authorities that exercise it. All over the world, the authorities exercising public supervision (including control) over the public procurement market are obliged to verify the contractors of procurement contracts in the light of the title jury criteria. Minimizing the risk of irregularities in the field of public procurement requires a multifaceted level of control, which is directly linked to increasing their transparency, in particular access to information about them and to the documentation gathered in the course of the procurement procedure. In addition, there should be an increased use of transparent electronic tools and the professionalism of those responsible for tendering should be improved. Proper public procurement control systems based on criteria of proper management of public property should

be a priority for national legislators. The provisions of European Union law also apply to the discussed subject. The most instructive standards can be found, among others, in:

- Approved on 11 February 2014 by the European Union: directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement (the classic directive)
- Directive 2014/25/EU of the European Parliament and of the Council of 26 February 2014 on procurement by entities operating in the water, energy, transport, and postal services sectors (sectoral Directive)
- Directive 2014/25/EU of the European Parliament and of the Council of 26 February 2014 on the granting of concession contracts. In addition, provisions: Directive of the European Parliament and of the Council of 11 December 2007 amending Council Directives 89/665/EEC and 92/13/EEC on improving the effectiveness of review procedures that relate to granting public contracts.

On the basis of the standards contained in the legal acts, it can be stated that the control of public procurements—based on the title criteria—may refer to such legal institutions as, for example, exclusion of the employee when awarding a public procurement. It is an expression of equal treatment (Bovis 2015). It is characteristic of the Public Procurement Law that the principle of equal treatment of contractors is connected with the principle of ensuring fair competition and transparency of tender procedures, although sometimes only the obligation to comply with this main principle is included in individual regulations (Graells 2015). It is also pointed out that the principle of equal treatment has a broader scope than the prohibition of discrimination itself, which does not oblige the entities applied to take positive action, as the principle of equality does (Sołtysińska 2006). The obligation to treat contractors equally applies to any public procurement procedure as long as it falls within the material scope of the relevant Union legislation. The Court of Justice of the European Union is of the opinion that the principle of equal treatment laid down in the Directive is a fundamental principle of the award of public contracts (Judgment of the Court of Justice 1993).

Equal treatment is an obligation at every stage of the procedure, protecting not only the contractors currently bidding for the contract in question but also “potential contractors” who may be interested in the contract on account of their subject matter and economic potential. It protects potential participants of the procedure by, among others, a general order to publish a contract notice or the necessity to prepare specifications of essential contract conditions with the application of the principle of protection of fair competition in the description of the subject matter of the contract (Halonen 2017). The award of a contract is not an act carried out by private entities; it is a form of public fundraising which aims to protect the public interest and to effectively spend the money coming from the budget. Equal treatment, on the other hand, fosters competition between entrepreneurs and thus the economic efficiency of the acquisition of goods, services, and works (Kumar et al. 2015). Representatives of the doctrine of public economic law stress that equal treatment and the resulting protection of competition are essential for the implementation of

the principles of proper management of public property in the sphere of public procurement (Sołtysińska 2006). Participants to the proceedings must be confident and certain that they will be treated according to the same rules and that their bids will be evaluated according to uniform, objective criteria. However, in order for this to happen, the contracting authority must ensure that employees or other people not personally interested in the outcome of the procedure participate on its side (Szustakiewicz 2007). It is pointed out that the possible lack of impartiality is also caused by the personal relationship (legal or factual) between the persons subject to exclusion and the contractor. It may exist before the procedure is initiated, it may arise in the course of it, and it may also have its origin in the content of the conducted procurement procedure. However, the personal professional contacts of the parties to the proceedings cannot be regarded as such. Representatives and attorneys of the contractor should be treated equally to the contractor.

Impartiality of people performing activities on the part of the contracting authority protects the correctness of spending public funds and serves the purpose of preventing corruption in public administration. Employees of the contracting authority who have no personal interest in the outcome of the procedure shall ensure that it is conducted in a correct and economically efficient manner. The regulations analyzed by me above have the effect of restricting the contracting authority's freedom to choose the employees who will conduct the proceedings on its side. If this choice violates the principle of impartiality, actions in the proceedings may be effectively challenged (Szustakiewicz 2007).

A sine qua non for the implementation of the control criteria in the public procurement system is the transparency of the procedures and the appropriate verification of the regularity of the procurement. The principle of transparency in the public procurement law is manifested on two levels: by universal access to information on the organization and course of proceedings and by access to its documentation. Consideration of this principle should begin by noting that it is impossible to analyze this specific directive in isolation from the other basic rules of the Public Procurement Law which guide the unauthorized application of the provisions of the legislation in question. The normative overall structure of the individual general principles of the Public Procurement Law determines the nature of the public procurement system, determining its juridical *differentiation specificam*. These principles interact with each other in a coherent way (Herc 2008). The principle of public procurement transparency can be considered on two levels: internal (toward the participants in the procedure) and external (toward all persons interested in the procedure) (Thai 2015).

Authorities controlling the public procurement system note that increasing the efficiency and transparency of the public procurement system and minimizing the risk of corruption can be achieved through, inter alia

- Introduction of an obligation for public entities to draw up annual public procurement plans regardless of their value (as the procurement plan provides the head of the entity with an overall knowledge of the number and value of planned

contracts, the deadlines and procedures for their award, which is essential for exercising reliable management control)

- Elimination of solutions from the procurement system which enable entities from the public finance sector to divide a contract into parts and to award it without applying the principles indicated by the legislator
- Introduction of the principle of recognition of appeals by participants of proceedings for placing a public order in multi-person composition, making this, for example, dependent on the specific threshold of the contract (Supreme Chamber of Control 2016).

4 Conclusions

The complexity of the functions and tasks of modern public administration requires an extensive and transparent public procurement control system. Creating and ensuring the effectiveness of such a system should be considered as one of the foundations of a modern democratic state governed by the rule of law, guaranteeing the implementation of the principles of proper management of public property. It may be stressed that it is desirable from the perspective of optimization of the system of public law control instruments to present in a comprehensive manner the issues related to the implementation of the title principles, inter alia, by introducing the principle of openness and transparency of procedures into the legal systems. On the other hand, openness itself constitutes a foundation for the implementation of the fundamental principles of the EU public procurement law, i.e., the principle of equal treatment of contractors (including potential contractors) and the principle of competition protection in the procurement process.

Taking into account the control function, it must be stated that the criteria of purpose limitation, legality, reliability, and economy have a direct impact on savings in the spending of financial resources, which are the responsibility of the public sector in a broad sense, and on creating the basis for the use of economic shares by entrepreneurs in the public market. It also has a positive impact on the reduction of pathologies in the sphere of public administration, i.e., corruption, nepotism, or money laundering. *De lege ferenda*, legislators all over the world should create such means of public oversight over the public procurement market which without hindrance can be applied in practice by the competent authorities and contribute de facto to the economic development of a given country. It is important to remember that, the award of a contract is not an act carried out by private entities; it is a form of public fundraising which aims to protect the public interest and to effectively spend the money coming from the budget.

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The Jurisdiction of the European Commission and National Competition Authorities in the Control of Legal and Economic Aspects of Concentration Between Undertakings



Wojciech Szydło

Abstract The objective of considerations raised within the chapter is to carry out an analysis of premises, principles and effects of the process of concentration of entrepreneurs who conduct their economic activity in member states of the European Union. Concentration of entrepreneurs is a complicated economic process which consists of the takeover of assets and liabilities of entrepreneurs who participate in it or else, the performance of: merger of enterprises, acquisition of an enterprise, joint venture, as well as pursuant to a purchase by a given entrepreneur of partial property of another entrepreneur. It thus causes substantial effects, both in legal and economic terms, for individual enterprises and for the common market. The chapter contains deliberations which are targeted at presenting the uniquely critical role played by proper preparation of entrepreneurs in the conduct of planned in the future concentration process both from the legal–organisational perspective and the economic one. The chapter furthermore contains an analysis, carried out on the basis of the provisions of Council Regulation (EC) on the control of concentrations between undertakings; jurisdiction procedure over the process of entrepreneurs’ concentration, carried out by the European Commission (EC) and national organs of competition of individual member states. The general interpretation principle in accordance with which the EC competence jurisdiction is related to the exclusive jurisdiction of concentration control bearing a community dimension will be subjected to an analysis, while national competition organs may investigate concentrations without the said community dimension. At the same time, the chapter will discuss and analyse the exceptions from this general rule regarding the division of competence jurisdiction amongst the EC and national competition organs, including in particular situations where concentration of entrepreneurs of non-community dimension is taken over by the EC for assessment and cases where concentration of community dimension is subjected to assessment in its entirety or part by national competition bodies. Deliberations are completed by an analysis of substantive and

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economic criteria of control of concentrations, carried out by the EC and national competition organs. While conducting deliberations in the above-stated areas of interest a research method consisting of an analysis of provisions of the European Union Law, achievements of the doctrine and EU court judicature having a substantial impact on the practice of the carried out concentration process was applied.

Keywords Concentration · Control of concentration · European Commission · National competition authority · Relevant market

1 Introduction

Entrepreneurs seeking to merge their undertakings should carry out a legal and economic analysis of the planned concentration, considering how the concentration will be viewed under competition regulations. If their main economic activity is within the European Union, the concentration will obviously be covered by EU competition law or, under certain conditions, also by competition law of the member state in which the companies operate. Under EU law control of concentrations with regard to their impact on competition in the EU is governed by Council Regulation (EC) No. 139/2004 of 20 January 2004 on the control of concentrations between undertakings (Regulation 139/2004).

A concentration is covered by Regulation 139/2004 only when it has a Community dimension as defined by the Regulation (Dudzik 2010). A Community dimension means that the combined aggregate worldwide turnover of all undertakings planning a concentration exceeds EUR 5 billion and the aggregate Community-wide turnover of each of at least two of the undertakings concerned is more than EUR 250 million (Article 1(2)(a) of Regulation 139/2004; Broberg 2013; Kokkoris and Shelanski 2014; Scott 2006). Concentrations in which none of the companies involved achieves over two-thirds of its aggregate Community-wide turnover in one member state are not covered by the Regulation (Article 1(2) *in fine* of Regulation 139/2004). Thus if one company achieved more than two-thirds of its Community-wide turnover (including the turnover of its subsidiaries) in just one member state and if the other company involved achieved more than two-thirds of its aggregate Community-wide turnover (including the turnover of its subsidiaries) in that same member state, the concentration would not have a Community dimension and would not be covered by Regulation 139/2004, but would solely be governed by the competition law in force in that particular member state.

Regulation 139/2004 understands “concentration” as only those activities that lead to a lasting change in the control of the companies involved and thus the structure of the market. This is defined in Recital 20 of the Regulation, with three forms of concentration being distinguished: (1) merger of previously independent undertakings; (2) takeover, by one or more persons already controlling at least one undertaking, of direct or indirect control of the whole or parts of one or more other undertakings; and (3) creation by the undertakings concerned of a joint venture

performing on a lasting basis all the functions of an autonomous economic entity (Article 3(1)–(4) of Regulation 139/2004; European Commission 2008, 7–123; Rosenthal and Thomas 2010).

2 The Concentration Procedure in the Light of Regulation 139/2004

A concentration with a Community dimension within the meaning of Article 21 (3) of Regulation 139/2004 is not, as a rule, covered by the competition law of any member state but solely by the Regulation in question (Article 1(1) of Regulation 139/2004). However, there may be an exception to this rule, when the Commission is informed by means of a reasoned submission, before the formal notification of a concentration, that the concentration may significantly affect competition only in a market located within a member state, which has all characteristics making it possible to describe it as a distinct market. The Commission, should it deem such a submission relevant, may refer the whole or part of the case to the competent authorities of the member state in question (Article 4(4) of the Regulation). If the Commission does not agree with the submission, the undertakings concerned are legally obliged, in compliance with the principle of “one-stop shop” system stemming from Recital 8 of the Regulation, to formally notify only the Commission of the concentration. It should be very clearly stressed that the intended concentration should be notified to the Commission even before its implementation (*ex ante*), although after a relevant agreement has been concluded between the undertakings involved (Article 4(1)(1) of the Regulation) or, alternatively, after the undertakings have demonstrated to the Commission their good faith intention to conclude such an agreement resulting in a concentration (Article 4(1)(2) of the Regulation). An intended concentration may not be implemented until the Commission has declared that the concentration is indeed compliant with the common market (Article 7(1) of the Regulation).

The Commission’s basic duty is to immediately examine the notified concentration (Article 6(1) of the Regulation). Should the Commission conclude that the notified concentration is not covered by the Regulation, then within 25 working days from the day following the notification, it issues a relevant decision (Article 6(1) (a) in conjunction with Article 10(1)(1) of the Regulation). Should the Commission find that the concentration falls within the scope of the Regulation and there are no serious doubts with regard to its compatibility with the common market, then within 25 working days from the day following the notification, it issues a decision not to oppose it (Article 6(1)(b) in conjunction with Article 10(1)(1) of the Regulation). Thus the Commission declares that the concentration is compatible with the common market. A similar decision, concerning the compatibility of the concentration with the common market, can be taken by the Commission, when it concludes that, as a

result of modifications introduced by the undertakings concerned, the concentration no longer raises any serious doubts concerning its compatibility with the common market (Article 6(2)(1) of Regulation 139/2004). In such a situation the Commission has 35 working days from the day following the notification to issue its decision (Article 10(1)(2) in conjunction with Article 6(2)(1) of the Regulation), to which it may attach conditions and obligations with which the undertakings concerned have undertaken to comply in order to make the concentration compatible with the common market (Article 6(2)(2) of the Regulation).

On the other hand, should the Commission find that the notified concentration covered by the Regulation does raise serious doubts with regard to its compatibility with the common market, then within 25 working days from the day following the notification it should issue a decision initiating formal proceedings. However, the Commission may also refer the concentration to the competent authorities of a member state (Article 6(1)(c) in conjunction with Article 10(1)(1) of the Regulation). It may also do it before initiating formal proceedings, if the circumstances provided for in the Regulation (Article 9) arise, as will be discussed further on in the chapter.

At each stage the Commission may initiate investigative proceedings with regard to the undertakings planning the concentration. The Commission may (issuing a simple request or decision) ask the companies involved as well as the governments and competent authorities of the member states to provide all the necessary information (Article 11(1)–(6) of the Regulation), may interview any natural or legal person in order to collect information relating to its investigation (Article 11(7) of the Regulation), may conduct necessary inspections of the companies. A failure to comply with these investigative procedures as well as a failure to notify a concentration before its implementation or implementation of a concentration while it is being examined by the Commission, or implementation of a concentration deemed by the Commission to be incompatible with the common market, a failure to satisfy the obligations imposed by the Commission's decision granting a conditional approval of a concentration, or a failure to comply with a decision dissolving a concentration give the Commission the right to impose a fine or periodic penalty payments on the parties concerned (Article 14(1) and (2) as well as Article 15(1)(a–d) of the Regulation). In the course of the Commission's proceedings, the undertakings or persons concerned have their right to defend themselves, including their right to access the case file, fully respected (Article 18(3) of the Regulation). Just as importantly, before deciding to impose a fine or periodic penalty payments and ending the proceedings, the Commission should enable the undertakings or persons concerned to express their opinion on the Commission's objections to these undertakings (Article 18(1) of the Regulation). The Commission's decision may be based only on those objections with regard to which the undertakings have been able to submit their observations.

After conducting such formalised proceedings concerning a notified concentration, the Commission may issue one of the following decisions ending the proceedings: (1) decision declaring a concentration compatible with the common market, if the Commission concludes that the concentration will not significantly impede effective competition in the common market or a substantial part of it, in

particular as a result of creating or strengthening a dominant position (Article 8(1) in conjunction with Article 2(2) of the Regulation); (2) decision conditionally declaring a concentration compatible with the common market, if the Commission concludes that, following modifications introduced by the undertakings concerned, the concentration will not create a significant impediment to effective competition in the common market or a considerable part of it, in particular as a result of creating or strengthening a dominant position; (3) decision declaring a concentration incompatible with the common market, if the Commission concludes that the concentration will result in a significant impediment to effective competition in the common market or a considerable part of it, in particular because it will create or strengthen a dominant position (Article 8(3) in conjunction with Article 2(3) of the Regulation); (4) decision dissolving a concentration, if the Commission finds that the concentration has already been implemented and declared incompatible with the common market, or has been implemented in violation of a condition attached to the decision which declared the concentration compatible with the common market (Article 8 (4) of the Regulation).

The Commission's decisions ending concentration proceedings as well as decisions imposing fines or periodic penalty payments may be taken by the companies concerned to the European Union's General Court (Article 256(1) in conjunction with Article 263 of the Treaty on the Functioning of the European Union). After hearing all points of law and fact raised by the companies, the Court rules on the substance of the case. It should be noted, however, that Regulation No. 139/2004 grants the Commission some discretionary powers, especially when it comes to economic assessments of concentrations. Consequently, a review by the court of the exercise of these discretionary powers, an action essential when the concentration rules are to be applied, must take into account the discretionary margin provided for in the economic provisions forming part of the rules. Thus judicial control of the economic aspects of concentrations is limited to ensuring compliance with procedural rules and statement of reasons, as well as the substantive accuracy of the facts, and verifying whether any manifest errors in assessment and any misuse of power have not occurred. It is not for the Court to provide its own economic assessment to replace that of the Commission (Case T-471/11; Case T-151/05).

On the other hand, undertakings may appeal from a judgement by the General Court to the Court of Justice of the EU, although this is restricted only to points of law. Thus an appeal to the Court of Justice may lie on the grounds of lack of jurisdiction of the General Court, a breach of procedure before the Court, which has an adverse effect on the appellant's interests as well as violation of Community law by the Court (Article 58 of the Statute of the Court of Justice of the European Union).

3 The Relevant Markets and the Market Position of the Merging Undertakings in Assessing the Legitimacy of the Concentration

In the Commission's examination of a concentration of crucial importance is the determination, with reference to the definition provided by competition law, of the relevant markets in which undertakings intending to concentrate as well as their subsidiaries operate. According to this definition, a relevant market is a combination of a relevant product market and a relevant geographic market. The former comprises all products (or services) regarded as interchangeable or substitutable by the consumer by reason of the products' (services') characteristics, their prices and their intended use (Commission Notice 1997). The latter comprises the area in which the companies concerned are involved in the supply and demand of products or services and in which the conditions of competition are sufficiently homogeneous, and which can be distinguished from neighbouring areas because the conditions of competition are appreciably different in those areas (Commission Notice 1997). Thus, under Regulation 139/2004, a relevant market is a market of products or services interchangeable (substitutable) from the point of view of their demand or possibly supply, which are commercialised within a geographic area characterised by fairly homogeneous conditions of competition (Navarro et al. 2005).

When assessing a concentration, the Commission should assess how it might impact competition. When considering whether it is compatible with the common market, the Commission examines the relevant markets in which the undertakings concerned and their subsidiaries operate (Article 8(1)–(3) in conjunction with Article 2(2) and (3) of Regulation 139/2004). That is why it is so important to establish their scope, also when the Commission is to decide whether a concentration can be referred in whole or in part to the national competition authority in the member state. A concentration could be referred to the national authority only when the territory of the member state in question or its part were to be regarded as a distinct relevant market in specific products or services commercialised by the undertakings concerned or their subsidiaries, and when the concentration could significantly impact or impede competition only in this distinct (national or narrower) relevant market. It is precisely within the scope of examining the impact of a concentration on such a market in a member state that the examination could be referred by the Commission to a competent authority in that member state (Article 4(4)(1) and Article 9(2), (3) and (7) of the Regulation). That is why determining the relevant markets will be crucial, as the competent authority of the member state will assess the concentration with regard to a specific relevant market or markets.

It seems that from the point of view of the merging undertakings it is good for the relevant markets in which these undertakings operate to be defined as broadly as possible in product and geographic terms. The broader the relevant market, the smaller the market share of the undertakings and thus the lower the threats to competition on the part of the merged undertaking and its subsidiaries. This is, in any case, how the Commission acts in practice, especially in the geographic

dimension. It stems from the fact that in concentration control cases the relevant market must be established prospectively, i.e. taking into account the conditions of competition likely to emerge in the future, when a concentration has been implemented and has begun to affect competition (Ritter and Braun 2007; Skoczny 2009). Significantly, the future conditions of competition taken into account by the Commission as it establishes the relevant markets for the purpose of concentration control have a tendency to evolve. In the case of many products or services the conditions of competition for the undertakings providing these products or services tend to become largely similar across the EU, becoming relatively homogenous in all member states. Thus the relevant markets for specific products and services have a natural tendency to “Europeanise” under the impact of changes in the market situation, technological developments, increasing European economic integration, etc. The Commission is aware of this and takes this into consideration in concentration control. Thus the relevant markets defined by the Commission are often described as European markets, i.e. markets encompassing, in the geographic sense, the entire territory of the EU or the European Economic Area, which is a manifestation of a “communitarisation” of these markets (Ritter and Braun 2007; Skoczny 2009). This is a very good situation for the companies concerned and their subsidiaries, because it reduces their market strength in the markets. This, in turn, allows the Commission or the competent authority of the member state to declare a concentration not to be posing a significant threat to competition in the relevant markets.

On the other hand, defining the relevant market relatively narrowly, especially in the geographic sense, by defining the market for a given product or service as a national or narrower market, could also bring tangible benefits to the undertakings, especially if such a national or narrower relevant market were to be located within a member state or its part. In such a case, under Regulation 139/2004 it would become possible to refer the concentration to the competent authority of the member state, which in many respects could be desirable for the undertakings concerned.

From the point of view of the examination of a concentration what is also important is the market position (strength)—expressed in their market share—of the undertakings concerned and their subsidiaries before the concentration. Consequently, what will be important is the market strength (share) of the merged undertaking as well as its subsidiaries. After a concentration’s market shares are calculated on the assumption that the combined market share of the merging companies is the sum of their market shares before the concentration (European Commission 2004). The predicted market power of the merged undertaking and its subsidiaries in the relevant market will be one of the basic factors taken into account by the Commission or the competent national authority in its assessment of whether the concentration will significantly impede or limit competition, especially as a result of creating or strengthening a dominant position.

The position of each undertaking and its subsidiaries in each relevant market should be determined primarily by calculating their volume or value sales of the relevant products or services in the area in question and by referring these sales to the volume or value sales of all other undertakings active in the market, i.e. competitors

(Navarro et al. 2005). The bigger the relevant market in geographic sense, the weaker the market strength (smaller market share) of the undertakings or their subsidiaries. In a geographically very large relevant market, in particular the European or world market, there are numerous undertakings from various countries. The activity of so many competitors considerably reduces the market share of the merging undertakings or their subsidiaries. This smaller share in the relevant market in turn significantly increases the chances that a concentration will be declared not to be constituting a significant impediment to competition and, consequently, will be declared admissible.

4 Division of Jurisdiction in the Control of Concentrations Between the European Commission and National Competition Authorities

The Commission has sole jurisdiction to investigate concentrations which have a Community dimension, while the national competition authorities can examine concentrations without such a dimension under their national competition laws. There are, however, certain exceptions to this general rule of division of jurisdiction between the Commission and the national authorities. In some situations concentrations without a Community dimension may be examined by the Commission (Article 4(5) and Article 22 of Regulation 139/2004). On the other hand, concentrations which have a Community dimension may sometimes be referred, in their entirety or in part, to a national competition authority or authorities (Article 4(4) and Article 9 of the Regulation) (Brittan 1991; Broberg 2002; Dudzik 2010; Skoczny 2005; Szydło 2005; Gola 2017).

It seems that the examination of a concentration by a national competition authority is advantageous to the undertakings concerned and their subsidiaries. Firstly, the undertakings have easier access to the competition authority assessing the concentration. Secondly, the national authority is more familiar than the Commission with the situation relating to competition in the relevant markets in the member state in which the undertakings and their subsidiaries operate and which will be mainly affected by the concentration. The national authority is well familiar with all the economic and technical nuances of these markets and knows their specificity. This means that it is the competition authority that can provide the best in-depth, substantive assessment of the concentration as well as its expected impact on the markets in question.

Thus, under Article 4(4) of Regulation 139/2004, undertakings planning a concentration may, even before the formal notification of the concentration to the Commission, inform the Commission that the concentration may have a significant impact on competition in a market, located in a member state, which can be characterised as a distinct market and thus the entire concentration or its part should be examined by the national competition authority of that member state. The

undertakings should point to indicators suggesting that there exist concentration-related competitive effects (European Commission 2005), and demonstrate that a geographic market in which competition is affected by the concentration in the manner described above is national or narrower than national in scope and thus the market is located within the territory of a member state or its part without affecting other member states or the entire EU (European Commission 2005). The information pointing to a significant impact of a concentration on competition in a distinct market in a given member state is just preliminary, and will not affect the result of the investigation of the concentration to be conducted by the Commission. If such a submission is made, the Commission is obliged to immediately pass it to all member states, which should, within 15 days, express their agreement or opposition to the request for concentration referral. If a member state makes no decision, it will be deemed to have expressed its agreement to the referral (Article 4(4)(2) of Regulation 139/2004).

Thus, if the member state in question expresses no opposition, and the Commission considers that such a distinct market exists in the member state and that the concentration may significantly affect competition in that market, it may refer the whole or part of the concentration to the competition authority of the member state for assessment in light of the national competition law in force in that state (Article 4(4)(3) of Regulation 139/2004). Significantly, the Commission often makes such referrals. It does so in the case of a concentration which has a Community dimension likely to affect competition in the relevant market (with a scope that is national or narrower than national), and the effects of which will be limited to one member state or which will have an economic impact mainly on one member state. Such concentrations are the most appropriate to be referred fully to the national level, if their effects are likely to occur only in a distinct market which cannot be described as a substantial part of the common market (European Commission 2005).

However, should a concentration be referred to the national competition authority only partially under Article 4(4) of Regulation 139/2004, the undertakings concerned are still obliged to notify it to the Commission, as the referral of the concentration to a member state does not change its classification as having a community dimension. In such a situation the Commission examines the concentration to the extent to which it has not referred it to the national authority. It is worth adding here that since the entry into force of Regulation 139/2004 (1 May 2004) the Commission has never rejected a request to refer a concentration to the national competition authority under Article 4(4) of the Regulation. Between 1 May 2004 and end of 2017 a total of 149 submissions were made by relevant entities to the Commission to refer a concentration to the national competition authority under Article 4(4) of Regulation 139/2004. In 135 cases the Commission referred the concentration in whole to the competent national authority and in 11 cases it referred the concentration in part. In the remaining three cases the submissions were most likely withdrawn (European Commission 2018).

A concentration already notified to the Commission may also be referred, in whole or in part, to the competent national authority, although in such a case Article 9 of Regulation 139/2004 applies. In order for a concentration to be referred on this

basis, no later than 15 working days after receiving a copy of the notification, the member state in question should, on its own initiative or following an invitation of the Commission, inform the Commission: (1) whether the concentration threatens to significantly affect competition in a market which is located within that member state and which presents all the characteristics of a distinct market (Article 9(2)(a) of the Regulation); (2) whether the concentration will affect competition in a relevant market within that member state, which presents all the characteristics of a distinct market and which does not constitute a substantial part of the common market (Article 9(2)(b) of the Regulation).

When invoking the first criterion, the member state should demonstrate on the basis of a preliminary analysis that there is a real risk that the concentration will adversely affect competition to a considerable degree, and therefore should be examined more closely, and that the geographic market in which competition is affected by the concentration as described above covers a part or the entire territory of that member state (European Commission 2005). If the Commission concludes that there is such a distinct market and such a threat exists, it will examine the concentration itself or refer the whole or part of it to the national competition authority (Article 9(3)(1) of Regulation 139/2004). However, if the Commission concludes that there is no such market and that such a threat does not exist, it will examine the case itself in line with the Regulation (Article 9(3)(2) of the Regulation).

When the member state invokes the second criterion, it must demonstrate that the concentration may have an impact on competition in a market that is a relevant market in a member state, but is not a substantial part of the common market. This last condition is met when the case concerns a market within the member state with a narrow geographic scope (European Commission 2005). If the Commission considers that such a situation does occur, it will be obliged to refer the concentration case to the national competition authority with regard to the market or markets mentioned above (Article 9(3)(3) of Regulation 139/2004; European Commission 2005, Point 41). In such a case the companies concerned should notify the concentration to the national competition authority, which, within the scope of the referral, should take a decision under national law (Article 9(6) and (8) of Regulation 139/2004).

Significantly, requests submitted by member states under Article 9 of Regulation 139/2004 to refer a concentration to a national authority are usually accepted by the Commission. Between 21 September 1990 (entry into force of Council Regulation 4064/89) and end of 2017 a total of 114 submissions were made to the Commission by member states to refer a concentration already notified to the Commission to a national competition authority (submissions under Article 9 of Regulation 139/2004). In 44 cases the Commission referred the concentration partially to a national competition authority, in 42 cases it referred the concentration fully, and only in 14 cases did the Commission reject the submission and refused to refer the concentration to the national level, while the remaining 14 concentrations were probably withdrawn by the applicants (European Commission 2018).

It should also be stressed that under Article 4(4) or Article 9 of Regulation 139/2004, the Commission may refer a concentration (in whole or in part) not

only to one competition authority of the member state concerned, but also, at the same time or alternatively, to another national competition authority operating in the member state where there is a distinct relevant market in which competition could be significantly impeded as a result of the concentration. Referral of a concentration, even if only partial, to another national competition authority increases the risk that the authority in question will conclude that the concentration creates a considerable impediment to competition in the national (or narrower than national) market and, as such, is inadmissible under the competition law of that member state, thus preventing the concentration from being implemented.

5 Substantive Legal and Economic Criteria of the Control of Concentrations by the European Commission and National Competition Authorities

Each concentration with a Community dimension as defined in Article 1 of Regulation 139/2004 will be appraised with regard to its impact on competition in the relevant markets. The appraisal will be carried out by the Commission under Article 2(1)–(3) of Regulation 139/2004, with the Commission seeking to determine whether the concentration is compatible with the common market (Article 2(1) (1) of Regulation 139/2004). In its assessment the Commission should consider factors like the need to ensure effective competition in the common market with regard to, *inter alia*, the structure of all the relevant markets as well as the actual or potential competition from companies located either in or outside the EU; the market position of the companies in question, their financial and economic power, alternatives available to suppliers and users, suppliers' and users' access to supplies or markets, legal or other barriers to market entry, trends in the supply of and demand for the goods and services in question, the interests of the consumers, both intermediate and ultimate, and technical and economic progress, if it is advantageous to consumers and does not impede competition (Article 2(1)(2) of Regulation 139/2004).

A concentration will be admissible, if it does not form an obstacle to effective competition in the common market or a substantial part of it, especially an obstacle resulting from the creation or strengthening of a dominant position (Article 2(2) of Regulation 139/2004). In such a case the concentration will be declared by the Commission compatible with the common market. The main criterion taken into consideration by the Commission in its assessment of concentrations under Regulation 139/2004 is the criterion of significant impediment to effective competition in the relevant markets in which the companies involved in a concentration operate. In this context the creation or strengthening of a dominant position in a relevant market or relevant markets by the merged undertaking or its subsidiaries will not be considered by the Commission as the only factor in concentration appraisal. As the Commission takes its final decision, it will be only one of many factors which the

Commission will examine in its comprehensive assessment of whether a concentration will significantly impede effective competition in the relevant markets. It is, therefore, possible that a concentration will create or strengthen a dominant position of the merged undertaking or its subsidiaries and yet the Commission will not declare it incompatible with the common market. This will happen when, following a comprehensive assessment of the effects of the concentration, the Commission becomes convinced that the concentration will not create a significant impediment to effective competition in the relevant markets. It is equally possible that when a dominant market position is not created or strengthened following a concentration, the concentration will nevertheless be declared by the Commission incompatible with the common market, if a comprehensive assessment of the concentration and all its prospective consequences convinces the Commission that the concentration will indeed impede effective competition in the relevant markets. That is why the Commission's decision over whether or not a concentration is compatible with the common market in line with the provisions of Regulation 139/2004 is always preceded by a careful and comprehensive assessment of all possible negative and positive consequences of the concentration for the competition mechanism in the relevant markets.

For the Commission the creation or strengthening of a dominant market position following a concentration is not a factor automatically determining the result of the assessment of the concentration in terms of whether it is compatible with the common market. It is, however, certainly one of the most important factors which the Commission takes into consideration. In this context it is important to bear in mind that under the EU law a dominant position is a position of economic power which a company enjoys and which enables it to prevent effective competition in the relevant market by behaving largely independently of its competitors, customers and also consumers (Case 27/76; Case 85/76; European Commission 2009, Points 9–18). According to established case law, a very large market share of an undertaking may in itself testify to the existence of its dominant position, save in exceptional circumstances (Case T-221/95; Case T-102/96). A market share suggesting a dominant position of a company is generally set in established case law at 50% (European Commission 2004, Point 17), although in some situations a market share of 30–40% may be enough for an undertaking to enjoy a dominant position (Commission Decision 1999, 2001; European Commission 2009). On the other hand, sometimes even a nearly 100% market share does not make an undertaking one with a dominant market position, if this share is not stable, stems from the company's initial competitive advantage or if there is a real risk that other (potential) competitors may enter the market (Case 85/76). In the Commission's practice, when the market share of the merged undertaking does not exceed 25%, it is presumed as a rule that the concentration does not create a significant obstacle to effective competition and is compatible with the common market (Recital 32 of Regulation 139/2004; European Commission 2004; Navarro et al. 2005).

When assessing how a concentration will influence competition in the relevant market, the Commission has to take into account the fact that the concentration will lead to a merger of undertakings currently competing against each other, which will

naturally remove any competition between them. Thus the concentration will increase the market strength of the merged undertaking in comparison with the market strength of the independent undertakings, and will give the merged undertaking a much bigger market share than the next competitor. Such an anticompetitive effect can be called a non-coordinated effect (Points 22(a) and 24–25 of the Commission's Guidelines on the assessment of horizontal mergers 2004). A concentration may also hypothetically lead to coordinated anticompetitive effects in the relevant markets, when the undertakings, which before the concentration did not coordinate their actions, become much more likely to coordinate their behaviour, raise prices and generally impede effective competition in the relevant markets post merger. This will occur especially if a collective dominant position is created or strengthened following the concentration (Point 22(b) of the Commission's Guidelines on the assessment of horizontal mergers 2004; European Commission 2004).

However, a concentration does not necessarily have to significantly hamper effective competition in the relevant market within the meaning of Regulation 139/2004. After the concentration the competitors of the merged undertaking or its subsidiaries will continue to be an important constraint of their market strength, expansion and operation, especially given the fact that these competitors will be able and motivated to increase their supplies and, consequently, their share in the relevant markets (European Commission 2004). Moreover, after the concentration the merged undertaking as well as its subsidiaries will be under competitive pressure exercised not only by their competitors, but also by their customers. Many of these customers may have and will continue to have the so-called countervailing buyer power, i.e. bargaining power of the buyer in relation to the seller in commercial negotiations on account of its size, commercial significance to the seller and the fact that it can switch to alternative suppliers (European Commission 2004; Commission Decision 2000). It is also highly likely that in the future new undertakings will enter the relevant markets in which the merged undertaking as well as its subsidiaries operate, because market entry is relatively easy given the lack of significant and hard to overcome barriers to entry (e.g. regulatory barriers, economic barriers or barriers associated with consumers' preferences). A threat that potential competitors will enter the market will reduce the market strength of the merged undertaking and its subsidiaries, and will deter these undertakings from taking advantage of their existing market strength (European Commission 2004). Finally, what matters is the fact that the concentration will conform fully to the requirements of dynamic competition, i.e. competition based on greater efficiency as well as continuous technical and organisational progress of the undertakings present in the market (Motta 2005; Ellig and Lin 2001). A concentration may thus paradoxically increase competitiveness in the relevant market, improving the conditions of economic development and raising the standard of living. This may increase market efficiencies and make the merged undertaking more able and more motivated to engage in pro-competitive behaviours which are beneficial to the consumers. Thus the undertaking will counterbalance any possible negative impact of the concentration on competition (European Commission 2004).

As for effects beneficial to consumers, production- or distribution-related cost savings brought about by a concentration may make the merged undertaking able and motivated to lower its prices. What may also be beneficial to consumers post merger are new or improved products or services emerging as a result of more efficient R&D and innovation. In addition, market efficiencies resulting from the concentration may encourage the merged company to increase production and reduce prices. This will make it less likely to coordinate its market behaviour with other companies. Thus greater efficiencies post merger may lower the risk of coordinated effects in the relevant market (European Commission 2004).

6 Conclusion

In practice very few concentrations notified to the Commission are met with an absolute prohibition of concentration. In a vast majority of cases the Commission agrees to the concentration or grants conditional approval. Between 21 September 1990 (date of entry into force of Council Regulation 4064/89) and 31 January 2018 the Commission received 6833 notifications of concentration, 183 of which were subsequently withdrawn. Thus the Commission examined 6650 concentrations. Of these no fewer than 6030 were declared by the Commission compatible with the common market (and, consequently, admissible) already in the first phase of the procedure, while in 291 cases the Commission agreed to the concentration in the first phase under certain conditions. In 55 cases the concentration was declared as not falling within the scope of Council Regulation 4064/89 or Regulation 139/2004. Two hundred and fifty-three concentrations were referred by the Commission to the second phase of the procedure (i.e. formal proceedings), out of which 58 were declared admissible by the Commission. In 123 cases the Commission granted its approval under certain conditions and only in 27 cases did the Commission issue an absolute prohibition of concentration (European Commission 2018).

It could thus be said that a concentration is highly likely to be declared by the Commission or national competition authorities compatible with the common market under Regulation 139/2004. Yet in order for this desirable effect to be achieved, the undertakings concerned should prepare their submission very well. In particular, they should choose appropriate arguments in favour of a sufficiently broad definition of the relevant markets, when considering whether to ask the Commission to refer the concentration to a national competition authority for partial assessment, and then correctly indicate the economic and technical arguments demonstrating that the concentration will not create a significant impediment to effective competition, and is in the public interest. These arguments, appropriately presented, adapted to the nature of the concentration and the relevant market, and supported by empirical data will certainly convince the Commission or the national competition authority that the intended concentration will not significantly hamper competition within the meaning of Article 2(2) and (3) of Regulation 139/2004. Thus undertakings should, when making their submissions, consider what structural or behavioural

commitments they would be willing to take on in order to eliminate any objections with regard to anticompetitive effects of their concentration, and in order for the concentration to continue to make economic sense.

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Public Tender as a Form of Selection of the Electricity Supplier for the Residents of the Commune



Przybylska Monika

Abstract The chapter focuses on the performance of public tasks by communes in the scope of ensuring energy supply to its inhabitants. This issue is based primarily on the EU concept of the internal market. EU legislation has obliged EU member states to open up the electricity market to competition. In this respect, the provisions of EU directives have enabled electricity consumers to choose their electricity supplier. Communes are consumers of electricity. They purchase it in order to perform the tasks assigned to them in the scope of satisfying the inhabitants' needs in the field of electricity. Since the commune is a public entity, it is obliged to purchase energy on the basis of transparent criteria, i.e. within the framework of a public procurement procedure. The aim of the chapter is to indicate which criteria should be taken into account by the commune when choosing the energy supplier, with the assumption that it should take into account not only price but also non-price factors, especially environmental protection during the generation of energy by energy companies. In the course of work on this chapter, the dogmatic method was used through the analysis of EU and Polish legislation.

Keywords Public tender · TPA principle · Electricity · Commune

1 Introduction

In Poland, the constitutional principle of decentralisation of public authority is in force, according to which some of the powers and responsibilities of public authority have been transferred from the public authorities to the local government bodies' public authorities of the lowest tier (Kiczka et al. 2018). According to this principle, the territory of the state is divided into communes, districts and provinces (Dudzik and Kawka 2014). The basic local government unit is the commune whose inhabitants form a self-governing community by virtue of law. The scope of the

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commune's activities includes all public matters of local importance, including mainly tasks whose performance allows to satisfy the collective needs of the commune's residents, such as, among others, matters related to environmental protection, water management, roads, streets and bridges, water supply, healthcare, social assistance, supporting the family, physical culture, public order and safety, fire and flood protection, pro-family policy, including the provision of social, medical and legal protection to pregnant women, as well as electricity, heat and gas supplies (Niewiadomoski 2015). The last of these public tasks is the most important in the context of the undertaken research issue, as according to the Polish law the commune is responsible for supplying the residents with electricity. Thus, the legislator made the commune a local energy policy creator. In this respect, the commune in particular: plans and organises energy supply, plans the lighting of public places and roads within the commune, finances the lighting of streets, squares and public roads within the territory of the commune, and plans and organises activities aimed at energy efficiency and the promotion of solutions to reduce energy consumption within the commune (Kosiński and Trupkiewicz 2016). The above remarks allow to conclude that the commune is a consumer (buyer) of electricity, which is then used by the commune residents (mainly in public buildings, e.g. schools, hospitals or community centres). However, it should be borne in mind that the commune belongs to units of the public finance sector, which means—in general—that (public) money must be spent in a transparent manner (Matusiak 2018). Transparency of cash disbursement by communes (and other public entities) is ensured by legal principles established in the Act of 29 January 2004—Public Procurement Law, which is discussed in more detail later in this text. The main purpose of the chapter is to answer the question: Is the commune obligated to choose an electricity supplier in the procedure of the public procurement? The detailed purpose of the publication is to indicate the criteria that the commune must follow when choosing an electricity supplier.

2 Legal and Factual Application of the Third-Party Access (TPA) Principle by Communes

One view, needed to achieve the research aim, is to show the essence of the TPA principle applicable in the energy sector, and then to determine the actual possibilities of applying this principle by communes. In Poland, as of 1 July 2007, the electricity market was opened up to competition, as confirmed by the provisions of the Act of 10 April 1997—Energy Law (Swora and Muras 2010). According to the provisions of the Act, customers of gaseous fuels or energy have the right to purchase these fuels or energy from a supplier of their choice (Sencar et al. 2014). National legislation therefore reflects EU law, as the right to choose a seller is guaranteed at EU level by Directive 2009/72/EC of the European Parliament and

of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC.

Therefore, the TPA is a principle allowing third-party access to the energy market, whereby the final customer is free to choose the energy supplier (generator or intermediary) that offers the best price and supply conditions. Member states shall ensure the implementation of a system of third-party access to the transmission and distribution systems, based on published tariffs, in accordance with Directive 2009/72/EC (Glachant and Ruester 2014). This system is intended to apply to all eligible customers and to be applied objectively and without discrimination. Member states are required to ensure that tariffs, or the methodologies underlying their calculation, are approved before they enter into force and also published. According to the provisions of the Energy Law, companies engaged in the transmission or distribution of energy are obliged to provide all consumers and companies engaged in the sale of energy, on the basis of equal treatment, with the services of transmission or distribution of energy. The transmission or distribution system operator may refuse access where it lacks the necessary capacity. However, such refusal must be duly justified on the basis of objective and technically and economically justifiable criteria (Czarnecka and Oglódek 2012).

The implementation of the principle of third-party access to energy infrastructure is intended to guarantee the existence of competition on the electricity market. This rule is intended to make it easier for final customers to switch supplier. Companies are obliged to make their networks available to energy suppliers, thanks to which the consumer has a greater possibility to choose the seller (Jaś-Nowopolska 2016). A prerequisite for the implementation of the principle of third-party access to infrastructure is the existence of the principle of service separation. Where transmission and distribution networks are owned by the same providers of electricity, there can be no question of non-discrimination or equal third-party access to infrastructure and thus no competition on the market. An instrument whose function is to separate network congestion and distribution activities from other activities (in particular generation and sale) is unbundling. In the energy sector, there has been accounting separation, functional/organisational separation, legal separation and ownership unbundling. This means that many changes, mainly in the structure of the electricity market, were necessary in order to fully exercise the powers provided for in the EU legislation. For example, transmission system operators have been designated, distribution system operators and electricity traders have been legally and organisationally separated (Driessche 2013).

This shows that the purchase and consumption of electricity is inextricably linked to its transmission. However, an eligible end-user may withdraw from the existing contract and separately (a) enter into an electricity purchase and consumption agreement with any energy supplier, (b) enter into an electricity distribution agreement with the distribution system operator. Therefore, the exercise of the right to switch supplier by communes (as well as by other consumers) is a broad issue, since—due to the unbundling requirement—the consumer of energy has to conclude not only a contract for the sale of energy but also a contract for the distribution or transmission of energy. Electricity is supplied after a connection to the grid, on the

basis of a sales contract and a transmission or distribution contract. A sales contract and a contract for the provision of transmission or distribution services may be concluded between a single customer and two separate electricity companies. In addition, a comprehensive agreement could be concluded (Kruimer 2011). A contract of sale shall contain at least the following provisions: the place of delivery of energy to the customer and its quantity broken down into contractual periods, the contractual capacity and conditions for its modification, the price or tariff group used in settlements and conditions for introducing changes in that price and tariff group, the method of conducting settlements, the amount of the discount for failure to meet quality standards of customer service, the parties' liability for failure to comply with the terms of the contract, the duration of the contract and conditions for its termination. On the other hand, the contract for the provision of energy transmission services, in addition to the requirements for the contract for the sale of electricity, must also contain provisions specifying, among others, quality standards, conditions for ensuring reliability and continuity of gas or energy supply, the method of conducting settlements and technical parameters of energy. A complex agreement may also contain provisions of energy sales contracts, contracts for the provision of energy transmission services, concluded by the seller for and on behalf of the final consumer with an energy company engaged in the transmission and distribution of electricity. For the sake of continuity of supply, the contract with the new seller should enter into force on the day of expiry of the contract with the existing seller. To this end, a new seller must inform the previous seller of the day on which he commences selling the electricity before the day on which he commences selling the electricity (Jaś-Nowopolska 2016).

As a result of the opening of the electricity market on the Polish electricity market, as in the EU member states, the number of companies trading in electricity has increased quite significantly. After such changes, as a result of which new entities engaged in electricity trading appeared on the market, the communes were obliged to purchase electricity by way of public procurement, but they cannot freely use the procedures provided for by the Act—Public Procurement Law, but they are obliged to apply the most competitive procedure for awarding public contracts, i.e. the tender, as detailed below.

3 Selection of the Energy Supplier by Way of a Public Procurement Procedure for the Purchase of Energy by the Commune

Communes may exercise their right to choose their electricity suppliers. This proves that they can choose their energy suppliers (i.e. change their existing ones) based on the needs and interests of the commune, including the interests of their residents (Winiarz 2017). With regard to the comments made in the previous point, it should also be made clear that the commune has a choice of energy seller and that there is no

choice of energy company for the provision of electricity distribution or transmission services, as these companies operate in the area of the so-called natural monopoly. In such a situation (i.e. in a legal and factual situation), the choice of the electricity supplier should be made by the contracting authority in such a way as to ensure competition, i.e. through an open tender (i.e. in which any interested energy company involved in energy trading can participate). In turn, the entity providing transmission and distribution services of electricity should be the entity to whose networks the properties of the contracting authority are connected. In practice, this can be achieved by awarding a public contract for the sale of electricity through an open tender, while a contract for the distribution of energy to the contracting authority's buildings can be concluded with a contractor selected through a direct tender. This means, however, that it will not be possible to use the negotiated contract at all for the conclusion of the electricity sales contract, since the electricity sales market has been fully competitive since 2007, and this means that there is no indication that this will activate the possibility that only one economic operator may perform the service for technical reasons of an objective nature. The contract under which electricity is purchased will be classified as a paid contract concluded between the contracting authority and the contractor, the subject of which will be supply or delivery together with services (Szostak 2010).

More precisely, it is worth pointing out that the use of electricity is possible on the basis of two independent contracts (sales contracts and distribution services contracts), which are two separate subjects of procurement procedures, or on the basis of a single contract which combines elements of the two aforementioned contracts, referred to as a comprehensive contract, i.e. a contract which combines the provisions of both the contract for sale of electricity and its distribution or transmission. If the commune decides to enter into a sales contract with a trading company, it is obliged to use the basic tender procedure, which is designed to ensure competitive behaviour of individual sellers and their bids. On the other hand, the conclusion of the electricity transmission contract because of the natural monopoly of the network companies will justify the use of a negotiated contract. If the commune decides to provide a comprehensive service, then it may be difficult to classify the contract correctly, as in this case two different subjects of the public procurement will be combined: supplies and services (Swora and Muras 2010). However, when analysing the Public Procurement Law, one may come to the conclusion that if a contract covers both deliveries and services, the provisions concerning the subject of the contract, whose valuable share in a given contract is the greatest, apply to awarding the contract. In principle, it can be considered that the supply of electricity will always be of greater value than the services allowing it to be used, so that in this case the negotiated procedure is abandoned and the procedure for concluding this contract must be carried out in accordance with the rules when the electricity sales contract is concluded (Hryc-Ląd 2016).

The contracting authority's obligation to apply the provisions of the Public Procurement Law arises when the contract exceeds a certain threshold value, which currently amounts to EUR 30,000. For this reason, the proper manner of defining the subject of the contract and estimating its value has a decisive influence

on the determination of the manner of concluding the contract (Smerd 2017). If the indicated amount is not exceeded, then the procedure of concluding the contract will be regulated by the general law relating to the rules of concluding contracts (Act of 23 April 1964—Civil Code). Difficulties in estimating the value of a contract for the purchase of electricity result in specific demand for this good. After all, the interest of the contracting authority (commune) will not be satisfied by a single service of limited size, which will allow the use of this good for a short period of time. Moreover, in the event of an ill-considered purchase of electricity and the necessity to conclude further contracts for the sale of electricity, the contracting authority could be charged with avoiding the application of the provisions of the Act by dividing the contract into parts. The essence of electricity supply is its availability to the customer throughout the duration of the contract in quantities necessary for the business. Therefore, the electricity sales contract will be different from the sale of other goods, since the purpose of the contract will be achieved only by regular access to this energy, which leads to the construction of a public procurement contract whose subject matter is services which are periodically repeated. This position is justified in the opinion of the Public Procurement Office, which argues that:

“We will only be dealing with a contract for supplies and services which are repeated periodically if the contract in question is repeated from time to time, but cannot be fulfilled by the one-off behaviour of the contractor and therefore is performed in parts, according to the current needs” (*Public procurement*, Anon, 2018). On this basis, the Contracting Authority shall first be obliged to determine the contract value basis in accordance with the rules relating to the estimation of the value of the so-called periodical contracts. Consequently, the basis for fixing the value of a service or supply contract, which shall be repeated periodically, shall be the total value of contracts of the same type: (1) granted within the previous 12 months or in the previous financial year, taking into account changes in the quantity of ordered services or supplies and the average annual consumer price index forecast for the given year, or (2) which the contracting authority intends to grant within 12 months following the first service or supply. On this occasion, it is therefore worth emphasising that it is not possible to award a public contract for the purchase of electricity for an indefinite period of time, which is an expression of support for the trend towards liberalisation of electricity trading in the energy law. However, a contract for the sale of electricity should not be concluded for a period longer than 4 years, unless appropriate circumstances exist. Specifically, it should be noted that the contracting authority may enter into a contract for periodic or continuous services for a period longer than 4 years, if performance of the contract over a longer period will result in savings of contract performance costs in relation to the 4-year period, or it is justified by the contracting authority’s ability to pay or the scope of the planned outlays and the period necessary to repay them.

The commune (as the contracting authority) is obliged to select the most economically advantageous tender for itself. It is obliged to do so by EU law, contained mainly in Directive 2004/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement, repealing Directive 2004/18/EC. In accordance with Article 67(2)(6) of the Directive, the offer must be favourable

economically from the point of view of the contracting authority shall be determined on the basis of price or cost, using a cost-effectiveness approach such as life cycle costing. Conversely, referring to Article 68 of Directive 2014/24/EU, it may cover the best value for money, which shall be estimated on the basis of criteria which cover qualitative, environmental or social aspects linked to the subject matter of the contract in question. It follows from the provisions quoted that, when selecting a tender, the contracting authority must take into account non-price criteria in addition to the price, but must also take into account life cycle costing. According to Recital 96 of the preamble to Directive 2014/24/EU, “the notion of life-cycle costing means all costs over the life-cycle of the works, supplies or services. It covers internal costs incurred by contracting authorities or other users, such as research, development, production, transport, use, maintenance and disposal costs [. . .]”. In addition, life cycle costing may include costs attributable to environmental externalities, including costs of pollution caused by the extraction of raw materials used in the product or by the product itself or its manufacture, provided that their monetary value can be determined and verified. In other words, life cycle thinking takes into account four cost groups, namely: (1) costs related to the purchase of the product (mainly price, but also other costs, e.g. financing), (2) costs related to the use—expenditure related to the use of the product (e.g. consumption of energy, water or fuel) and (3) maintenance costs—expenditure related to ensuring the readiness of the device or object for use, e.g. costs of repairs, repairs, insurance or management and (4) costs related to decommissioning, e.g. costs of recycling or scrapping (Janssen 2018).

EU law thus leads to the overall conclusion that the most economically advantageous tender is the one which represents the best balance between price and other criteria relating to the subject matter of the public contract, or the lowest price. The commune shall select the most advantageous tender on the basis of the criteria for the evaluation of the tenders laid down in the tender specifications. The criteria for evaluating the tenders shall be price or price and other criteria relating to the subject matter of the contract, in particular quality, performance, technical characteristics, environmental, social, innovative aspects, service, completion date of the contract and running costs. In the light of the above, it should be concluded that price is an obligatory, but not a single criterion for evaluating offers, which may be used by the contracting authority when selecting the most advantageous offer. In addition to the price, the contracting authority should in principle apply other criteria relating to the subject matter of the contract. It should be remembered that it is the contracting authority itself that decides on the application of specific criteria for evaluating tenders, based on the specific nature of the subject of the contract and the need to obtain the contract on the most advantageous terms. The criteria defined by the contracting authority for evaluating tenders should relate to the subject matter of the contract. This means that the contracting authority may not use any evaluation criteria, but only those that apply to the service offered. On the other hand, it should be noted that the criteria for the evaluation of tenders may not concern the characteristics of the economic operator, in particular its economic, technical or financial standing. In that regard, therefore, there is a restriction on the contracting authority’s

freedom to determine the criteria on which tenders are to be evaluated (Stawiński 2016).

As far as the subject is concerned, it is correct to take the view that the non-price criterion, which should be used by the commune when selecting the offer for the purchase of electricity, is the criterion of the source of electricity generated from renewable sources. Such a criterion is consistent with the general non-price criterion of environmental aspects. However, by requiring electricity to be produced from renewable sources, communes can also become a promoter of increased electricity generation from renewable sources. The non-price criterion, consisting in promoting renewable energy in the choice of energy supplier for the commune, is in line with the common trend of ordering an increase in the production of electricity from renewable sources in each EU member state, as laid down in Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/3/EC. The Directive obliges Member States to achieve a certain increase in electricity generation from renewable energy sources by 2020. Communes, as part of the state, should also feel co-responsible for fulfilling their obligations under EU law (Klessmann 2009). There is no doubt that when issuing a tender for the purchase of electricity supplied to a commune, the introduction of a criterion for the production of this energy from renewable sources with a justification for a favourable evaluation of the offer of an energy company that will supply energy to a commune from renewable sources (to a certain extent), places such commune in the role of an entity promoting the generation of electricity from renewable sources. At the same time, such activity of the commune is consistent with the regulations of the EU law. At the same time, the introduction of environmental aspects as criteria for the assessment of offers will contribute to the reduction of environmental degradation. Thus, the criterion of electricity generation from renewable sources will contribute to measurable financial savings, as it will save—in the future—public funds spent on environmental improvement. It should be clearly emphasised that the commune must determine the significance of the criterion of electricity generation from renewable sources for the evaluation of the offers of energy companies. In this respect, each contracting authority, including the commune, shall establish a percentage for each criterion on the assumption that all the criteria taken as a whole represent 100%.

4 Conclusion

The introduction of the TPA principle in the energy sector and the possibility for entities to change their electricity supplier are beneficial legal solutions which can bring tangible economic benefits to electricity consumers. These customers may decide which service providers they want to use. This principle is the same for both individual and public sector consumers, such as communes, which are responsible for providing electricity to their residents and thus for ensuring a continuous

shutdown of electricity mainly in public buildings. However, the commune should set up, in particular, a monitoring system for electricity consumption and supply volumes and analyse contractual capacity contracts before proceeding with the supplier switching procedure. It also has to prepare a database of the facilities it uses, which will include, among others, information on the technical data of the buildings and the type of business conducted in it. Analysis of the energy consumption profile of individual public buildings will help to prepare tender documents. According to the research, the commune may fully exercise the available right to change its electricity supplier; however, due to the fact that it belongs to the category of public entities (spending on public finances), it is obliged to conduct a public tender for the selection of the electricity supplier. There is no doubt that when selecting a new electricity supplier, the commune is guided by the will to reduce the expenses related to the purchase of electricity; however, bearing in mind the EU law, it is obliged to take into account also other cost factors as well as non-price criteria. In the latter dimension, it must take into account the EU climate policy and evaluate positively the offers of those sellers who will supply energy generated from renewable sources in the area of the commune.

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The Most Economically Advantageous Tender in the Public Procurement System in the European Union



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Abstract The aim of the chapter is to list the features of the most economically advantageous tender and to stress its significance in the public procurement procedure. The chapter concerns selection of most economically advantageous offer in the area of public procurement law of the European Union. The awarding entity may find the tender the most economically advantageous if they point out the best quality/price ratio, taking into account quality, ecological or social aspects of a given object of the contract. The price or the cost of the contract should also be taken into consideration in the evaluation. Thus the price-related criterion is essential whereas the quality of offered goods and services is of the greatest significance so that the most economic tender was the most economically advantageous from the point of view of the awarding entity. Defining the most economic tender, the authors of the chapter point out at general methods of selecting it on the basis of objective reasons economic calculation and other methods of calculating it. Moreover, they present legal regulations in selected Member States as regards criteria of selecting the most economically advantageous tenders in the public procurement procedure implementing EU directives. Formal and dogmatic method and the ratio analysis have been used. The case study has also been presented.

Keywords The law of the European Union · Public procurement · The most economically advantageous tender · Contract award procedure

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1 Introduction

The tender in the area of contract award procedure is understood as a unilateral act of the economic operator taken voluntarily in the scope specified by the awarding entity in which the economic operator undertakes to become a party to a future public procurement contract on the terms and conditions defined in their tender in the event that their tender has been selected by the awarding entity. Thus, the fundamental authority of public procurement law thanks to which the awarding entity can purchase given goods or services consists in the authority selecting the most economically advantageous tender by the awarding entity. Generally speaking, legal regimes of public procurement allow for two basic types of criteria of selecting the most advantageous tender, namely: (1) criterion of the lowest price paid for purchased goods or services, or criterion of the lowest cost connected with given goods or services, and (2) the criterion of the most economically advantageous tender. Currently it is generally acknowledged in the theory and practice of public procurement law that the other criterion, i.e. the criterion of the most economically advantageous tender regulated by the provisions of new EU directives of 2014 related to public procurement (that should be implemented in legal systems of individual Member States in 2018 at the latest) is the basic (priority) criterion that enables to ensure the completion of the contract at the highest possible level.

The very definition of the “criterion of the most economically advantageous tender” may seem to be slightly misleading. It suggests that the alternative criterion of selecting a tender, i.e. the criterion of the lowest price or the lowest cost cannot result in selection of the most economically advantageous tender for the awarding entity. However, the criterion of the lowest price or the lowest cost is also to be taken into account and result in the awarding entity’s selecting the most economically advantageous tender but expressed only in the lowest price or the lowest cost of goods of services purchased. The criterion of the most economically advantageous tender, although defined on the basis of the lowest price or costs of the product or service, additionally applies the attitude based on cost effectiveness that can be estimated on the basis of additional factors, e.g. quality, environmental or even social aspects connected with the object of a given public procurement. It enables the awarding entity (upon selection of the economic operator) to refer not only to the price of concrete goods or services, which would make him choose the tender with the lowest price, but also the whole range of other factors that make the tender the most economically advantageous (Zimmermann 2017).

The criterion of the most economically advantageous tender applied by the awarding entity allows for better execution of basic objectives of public procurement law. First of all, it may result in obtaining better economic effectiveness of purchase made as part of public procurement. Economic effectiveness consists in a strive for a status in which the awarding entity will satisfy demand for the required goods by way of as economically effective transactions as possible, i.e. by way of the most advantageous (the most optimal) ratio of the value of purchased goods evaluated from the point of view of the awarding entity such as usefulness of goods to satisfy

needs of the awarding entity, their quality, functionality, conditions of exploitation of goods, their delivery dates, durability, etc., and the price paid for specific goods or costs incurred in connection with such goods. Second, thanks to the use of a criterion of selecting the most economically advantageous tender, other concrete positive consequences can be obtained in the general economic area, exceeding economic effectiveness itself of purchase made, and connected with obtaining a series of rational benefits in social or ecological area (Arrowsmith 2011).

The use of the criterion of the most economically advantageous tender in the public procurement procedure taking into account methods discussed below should enable the awarding entity to obtain goods or services with the highest possible value at the lowest possible price or at the lowest cost, and it should be the awarding entity's objective. However, it should be stressed that the selection criteria applied by the awarding entity are first of all specified by the law (e.g. public procurement law), and therefore, it is the legislator that has influence on establishing them by the awarding entity for the purpose of individual contracts; the awarding entities can decide more freely on further selection criteria. The objective of the chapter is to point out the features of the most economically advantageous tender and to stress its significance in the contract award procedure. The publication is based on a formal and dogmatic method, and the ratio analysis has been used. The case study has also been presented.

2 The Most Economically Advantageous Tender in the EU Law

In the EU, awarding entities apply the criterion of the most economically advantageous tender. It has been regulated in Article 67 of the regulation of the European Parliament and the Council Directive 2014/24/UE of 26 February 2014 on public procurement and repealing Directive 2004/18/EC and in Article 82 Par. 2 of the regulation of the European Parliament and the Council Directive 2014/25/EU of 26 February 2014 on procurement by entities operating in the water, energy, transport and postal services sectors and repealing Directive 2004/17/EC.

The EU legislator emphasises the importance of a simple and accessible definition of the provisions of the directive and the use of the concept of the "most economically advantageous tender". It has been acknowledged that all winning tenders should be selected in terms of the most economically advantageous solutions (Horubski 2016). It should be stressed that although pursuant to new directives the contract is awarded on the basis of the most economically advantageous tender, it is often possible to choose the tender based only on its price. Since the selected tender should be the most economically advantageous from the point of view of the awarding entity, the tender at the most advantageous price may also be found to be most economically advantageous (Bovis 2015). It is also demonstrated in the provisions of Article 67 Par. 2 of Directive 2014/24/UE based on which Member

States are authorised to exclude the possibility of applying the criteria of price or cost by the awarding entities as the only criterion of awarding contract or limiting their use to specific categories of awarding entities or specific type of contracts. It should be emphasised that the most economically advantageous tender is defined as such on the basis of price or cost with the use of the attitude based on cost effectiveness, such as life-cycle costing. It may include the best quality/price ratio that is estimated on the basis of criteria covering quality, environmental or social aspects connected with the object of a given public contract. Such criteria may include: quality, including technical value, aesthetic and functional properties, availability, design for all users, social, environmental and innovative features, trade and its terms and conditions, organisation, qualifications and experience of personnel appointed to complete a given contract in the event when the properties of such personnel may have a material impact on the level of completion of the contract, after-sale service and technical support, supply conditions, such as date, method and duration of supply or lead time. Cost element may also be manifested by a fixed price or a fixed cost on the basis of which economic operators compete only with reference to quality criteria (Case C-368/10).

It is worth mentioning that based on the EU law, Member States can freely regulate this issue as part of domestic regulations. Thus, it is Member States that will decide whether the use of the price criterion in contracts awarded in such states should be limited (Case C-513/99; Case C-448/01). However, Member States are encouraged to do so, and the preamble of directives points out that excluded possibility of using the criterion of price or cost as the only criterion used in the evaluation of the most economically advantageous tender or limited use of such factors aim at encouraging awarding entities to pay more attention to the quality of the contract. Following adjudication of the Court of Justice of the European Union, guidelines concerning formulation of evaluation criteria it can be stated that they cannot confer an unrestricted freedom of choice on the awarding authority. It should be remembered that the “awarding entity is authorised to review correctness of the evaluation of individual elements of the object of the contract not only in case of a cost estimate price but also when the price for the completion of the contract is a lump sum price” (Judgement 2017). It should be emphasised that contract award criteria cannot result in the unrestricted freedom of choice conferred on the awarding authority in the European Union (Gola 2013). Representatives of the doctrine stress that the criteria referred to above provide for a possibility of effective competition and they are accompanied by specifications that enable effective verification of the information presented by the tenderers (Halonen 2017). Moreover, in case of any doubts awarding entities effectively verify whether the information and evidence provided by the tenderers are correct (Szydło 2014). It is worth mentioning that public contracts should be awarded on the basis of objective and transparent criteria so that it was possible to determine, in the conditions of effective competition, which tender is the most economically advantageous tender (Graells 2015). Besides, in order to encourage the awarding entity to pay more attention to the quality, the EU legislator applies the law of Member States to forbid the use of price only or the cost only upon the evaluation of the most economically advantageous tender or to restrict the use of such evaluation criteria. However, it should be noted that in such event

awarding authorities have to provide material reasons if it is impossible to establish in advance the evaluation method of the tender. The awarding entities should point out at the criteria in a decreasing order of importance. However, contract award criteria cannot have impact on the application of domestic regulations that specify fixed prices for concrete supplies or remuneration for specific services. Representatives of the doctrine of public commercial law state that in such event it is possible to estimate quality/price ratio based on other factors than the price or remuneration (Przeszło 2015). New EU regulations concerning the most economically advantageous tender become an inseparable part of the instrumentalisation process of public procurement. Summing up it should be stated that regulation of evaluation criteria reflects the change of a view on the function of public procurement law and its strong instrumentalisation towards the tool that enables execution of many different political goals (Stawiński 2016).

3 The Most Economically Advantageous Tender in Selected Member States

Taking into account implementation of the EU laws in internal orders of Member States it is worth mentioning that according to the Polish Public Procurement Act, contract award procedure leads to the selection of the most advantageous tender according to the criteria established by the awarding entity. The awarding entity has a right to choose: (1) the most economically advantageous tender (i.e. presenting the most advantageous balance of price and other criteria) or (2) the tender with the lowest price, whereas it should be added that the evaluation criteria of tenders have to refer to the object of the contract and cannot refer to the properties of the economic operator, including their economic, technical or financial credibility. Selection of the most economically advantageous tender means that the awarding entity is provided with a high-quality product that optimally corresponds to their needs. Pursuant to Article 91 Par. 2 of the Public Procurement Act: “evaluation criteria include price or cost, or price or cost and other criteria referring to the object of the contract”. It means that in principle at least one criterion always has to refer to price or cost. The remaining criteria connected with the object of the contract can be freely selected by awarding entities. Thus, the concept of the most economically advantageous tender is inherently connected with contract award procedure in which the awarding entity looks at the price and other criteria, i.e. non-price criteria as well as life-cycle costing. It means that the awarding entity gets another advantage while selecting the tender not only in terms of the price but also taking non-price criteria into account. Polish legislator enumerates examples of criteria that—apart from the price—can be taken into account by the awarding entity. Non-price factors include mainly (but not exclusively): (1) quality, including technical parameters, aesthetic and functional properties; (2) social aspects, including professional and social integration of the disabled and unemployed, availability for the disabled or taking

into account users' needs; (3) environmental aspects, including power effectiveness of the object of the contract; (4) innovative aspects; (5) organisation, professional qualifications and experience of people appointed to complete the contract, if they can have a material impact on the quality of the completion of the contract; and (6) after-sales service and technical support, supply conditions, such as date, method and duration of supply or lead time (Banasik 2011). It should be stressed that the evaluation criteria of tenders should be determined by the awarding entity in a consistent and clear manner in order to enable verification of the information provided by the economic operators. Apart from the fact that the awarding entity is obliged to specify criteria in detail, they also have to assess their value as well as the method of evaluating tenders on the basis of indicated criteria. This requirement results from the fact that economic operators should be fully aware how and based on which information their tenders will be evaluated so that they could put relevant data in the content of the tenders. Therefore, describing evaluation criteria of tenders and the principles of using them, the awarding entity has to specify what kind of information it expects and selects such evaluation methods so that it was possible to effectively verify and compare the information presented by economic operators in the tenders.

Pursuant to Article 91 Par. 3c of the Public Procurement Act, life-cycle costing may include in particular costs: (1) incurred by the awarding entity or other users connected with: purchase, consumption, especially consumption of Energy and other resources, maintenance and withdrawal from operation, especially costs of collecting and recycling; (2) assigned to ecological external effects connected with a life cycle of a product, service or construction works concerning emission of greenhouse gases and other pollutions and other related to climate change mitigation unless their cash value can be determined and verified. Costs connected with the acquisition of a product shall simply refer to the price. However, it may turn out necessary to specify that should be included in the proposed price. It is in particular about avoiding double expenses calculated by economic operators in individual categories of costs. As part of this category costs connected with financing of an investment, e.g. credit interest, should also be taken into account. Costs of using the product include expenses connected with its operation and can not only refer to the consumption of energy but also with consumption of water, printing tonners or fuel. The use of cost criterion will result in favouring products that can be more expensive to buy but cheaper to maintain, e.g. low-energy buildings, energy-saving devices or even hybrid or electric vehicles. In case of electric devices calculation of operation costs should take the manufacturer's declaration into account as regards power consumption, and in case of vehicles—the average fuel consumption. Costs of energy and fuel should be based on rates included in agreements with suppliers. Energy consumption parameters provided by producers are of declarative nature; however, they are sufficient for the purpose of comparing tenders submitted by economic operators. As far as the maintenance costs are concerned, all expenses should be listed connected with ensuring readiness of a given device or object to be used, especially costs of repairs, insurance or administrative costs (e.g. registration if a vehicle is the object of the contract). In turn, costs connected with withdrawing from operation, i.e. costs of collecting and recycling are hard to be defined. For

instance, Polish regulations say that sellers of batteries are obliged to collect a deposit fee that is returned once the battery is given for utilisation.

Moreover, which is essential from the point of view of the EU climate policy, life cycle of the product may also cover costs assigned to ecological external effects concerning emission of greenhouse gases and other pollutions or related to climate change mitigation unless their cash value can be determined and verified. It should be noticed that the legislator does not restrict these costs only to life cycles of products connected with their use by the awarding entity. Therefore, the life-cycle costing should include all stages of product life, starting from its design until withdrawal from operation and demolition or recycling. The evaluation method of external environmental cost has to correspond to the following conditions: It has to be based on verifiable and non-discrimination criteria, it has to be available for all interested parties, necessary data have to be provided with justified input of Energy of economic operators acting with due care. Methods of estimating external environmental costs need to be of general nature, cannot only serve for the purpose of concrete contract award proceedings. They can be prepared on any administrative level, so, they can be local, regional or national; however, they cannot disrupt competition. It should be stressed that Polish legislation does not forbid to apply the criterion of price as the only criterion for selecting a tender. Nevertheless, the price cannot be applied as the only criterion of evaluating tenders with weight exceeding 60% in two cases: (1) the awarding entities define quality standards referring to all essential features of the object of the contract in the description thereof, and (2) the awarding entities will specify in the appendix to the report how the costs of a life cycle have been taken into account in the description of the object of the contract.

Also other Member States prefer to use criteria of the most economically advantageous tender in the contract award procedure, applying the lowest price criterion only to standard supplies or services (Szostak 2010). In order to evaluate and select the most economically advantageous tender in France and Spain, criteria directly related to the object of the contract have to be taken into account such as quality, price, completion or supply time limit, cost of operation, ecological characteristics or criteria connected with satisfying necessary social requirements defined in the terms of reference, characteristic for the population living in particularly bad situation to which users or beneficiaries of the object of the contract should belong, profitability, technical features, aesthetic or functional characteristics, availability and the cost of spare parts, maintenance, technical support, after-sales service and the like. When the awarding entity applies only one criterion, it always has to be the price (Janssen 2018). Referring to Spanish regulations, it is worth noticing that pursuant to Article 150 Par. 4 of *Texto Refundido de la Ley de Contratos del Sector Público*: “if at least two criteria have to be taken into account, relative weight assigned to each criterion has to be established, which may be expressed with the use of a range with suitable maximum span. If the tender procedure is divided into more stages, the information has to be provided which criterion should be applied at a given stage as well as a minimum number of points to be obtained by the tenderer in order to be able to participate in the selection process”. In the nearest future, in view of the

aforementioned regulation, a legal concept appeared with reference to which the opinion by the General Spokesman was provided in June 2018. Órgano Administrativo de Recursos Contractuales de la Comunidad Autónoma de Euskadi (administrative authority dealing with appeals against administrative decisions in the area of public procurement of Autonomous Community of País Vasco, Spain) asked a prejudicial question whether domestic regulations can authorise awarding authorities to effect a two-stage verification of tenders in an open procedure so that at the second (economic) stage tenders with maximum number of points obtained at the first (technical) stage are only evaluated. Referring to this issue, the General Spokesman expressed the opinion that following the contract award criteria provided for in Article 67 Par. 2 and 4 of Directive 2014/24/UE, the awarding entity is not prevented from being authorised to decide on the evaluation of tenders in stages in the documentation of the contract awarded under the open procedure. The aforementioned opinion is consistent with the opinion presented by Spanish appeal authority (i.e. the aforementioned Órgano Administrativo de Recursos Contractuales de la Comunidad Autónoma de Euskadi) as regards the content of the question asked. It leads to the conclusion that in Spain—according to the EU laws—awarding entities evaluate tenders submitted by economic operators in two stages. However, it is worth emphasising that irrespective of whether it is about economic or technical stage, the awarding entity is obliged to evaluate the tender in accordance with Article 67 of Directive 2014/24/UE, so, it is obliged to base the contract on the most economically advantageous tender (Case C-546/16).

4 Evaluation of the Most Economically Advantageous Tender

In the course of a contract award procedure the most economically advantageous tender is selected—where a set of additional criteria is taken into account apart from the price—or the tender with the lowest price. The other method is applied most often although the cheapest tender does not always result in the best effect of the contract.

If the most economically advantageous tender has been selected, additional measurable and non-measurable criteria appear, whereas the latter have to be quantified. So, the evaluation criteria include for instance price, quality, technical value, profitability, costs of use, aesthetical and functional properties, environmental aspects, technical support, date of supply and lead time, certainty and continuity of supplies, after-sales services, and costs of a life cycle.

Two-stage evaluation process (technical and financial evaluation) is often used in the evaluation of the most economically advantageous tenders. At the stage of technical evaluation points are assigned on the basis of individual criteria (other than price), whereas each criterion is assigned a specific weight in the documentation. At the stage of financial evaluation relative costs of individual tenders are compared. Then the ranking of tenders is prepared taking into account aggregate evaluations resulting from the assigned weights in relations to the offered price.

Table 1 Technical evaluation of the contract—example

Evaluation criteria	Weighing factor (%) (1)	Criterion evaluation (2)	Weighing evaluation (3) = (1) × (2)
Criterion 1	15	80	12
Criterion 2	20	90	18
Criterion 3	25	100	25
Criterion 4	40	120	48
The result of technical evaluation			103

Source: Own survey on the basis of Public Procurement Directorate (2013)

Table 1 presents example criteria of technical evaluation. Factors are expressed as percent values summing up to 100. Weight from the range of 80–100 has been assigned to each criterion, where 100 means that all requirements specified in the tender documentation have been met, 120 results from exceeding some or all requirements provided for in the tender documentation, whereas 80 means that not all requirements have been met; however, the tender was accepted since deviations are deemed to be minor.

At the stage of financial evaluation financial tenders are evaluated, relative cost *C* of each tender is estimated as the percent value of the cheapest financial tender. For example, if the lowest price offered by the tenderer amounts to 100,000.00 euro whereas the tenderer offered 140,000.00 euro, the price of the tender shall be calculated as $K = [(100,000)/(140,000)] \times 100 = 71.43$. The financial tender of the tenderer with the lowest price gets 100 points.

Weighing of the technical value of the contract in relations to the suggested price takes place by way of selecting a suitable weighing factor, as in case of the aforementioned two-stage evaluation process. Selection of a suitable factor “*n*” is necessary that will determine the final ranking of tenders arranged according to the decreasing value of aggregate evaluation *L*, calculated with the use of the following formula:

$$L = T \times n + C(1 - n) \tag{1}$$

where *T*—the result of technical evaluation, *C*—relative costs of the financial tender, *n*—weighing factor used for weighing the technical value of the contract in relation to the proposed price.

Taking the weighing factor at the level of 80%, the final evaluation is $L = (103 \times 0.80) + (71.43 \times 0.20) = 96.69$.

Therefore, in the event of selecting the most economically advantageous tender, first of all the criteria have to be chosen, and then assigned relevant weights of the technical value of the contract in relations to the proposed price. High value of weighing factor *n*, i.e. over 80% causes that the tender with the highest technical value of the contract is selected, whereas the low value of weighing factor *n*, i.e. below 60%, means in fact that the criterion of the most economically advantageous tender is abandoned to the benefit of the lowest price criterion. In other words,

weighing factor n specifies the financial expense to be incurred by the awarding entity in order to select the tender of a higher technical value. Therefore, definition of a suitable weighing factor n is of critical importance in accordance with the requirements of each contract since the best quality/price ratio can be obtained in this manner.

Adopting the weighing ratio of 80% to specify weight of the technical value of the contract in relation to price ($n = 80\%$), proportion $n/(100 - n) = 80/20 = 4$ means that the awarding authority accepts the price higher by 4% in order to get the increase in the technical value of the contract by 1%, the price higher by 8% in order to get the increase in the technical value of the contract by 2%, the price higher by 12% in order to get the increase in the technical value of the contract by 3%.

Therefore, when the financial tender is higher by 4.1% in comparison to other competitive tender, whereas the technical value of the contract is lower by 1%, the tenderer offering lower price and lower technical value of the contract will be preferred. On the other hand, when the financial tender is higher by 3.9% in comparison to other competitive tender, whereas the technical value of the contract is lower by 1%, the tenderer with higher price and higher technical value of the contract will be preferred.

Analogically, adopting the weighing ratio of 70% to specify weight of the technical value of the contract in relation to the order ($n = 70\%$), proportion $n/(100 - n) = 70/30 = 2.33$ means that the awarding authority accepts the price higher by 2.33% in order to get the increase in the technical value of the contract by 1%, the price higher by 4.66% in order to get the increase in the technical value of the contract by 2%, the price higher by 6.99% in order to get the increase in the technical value of the contract by 3%, etc. In this case the proportion is explicitly lower than in case of the previous example. It means that the percent increase of the price proposed by the tenderer with a high technical value of the contract accepted by the awarding entity is significantly lower.

In this case, when the financial tender turns out to be higher by 2.5% in comparison to other competitive tender, whereas the technical value of the contract is lower by 1%, the tenderer with a lower price and lower technical value of the contract will be preferred. On the other hand, when the financial tender is higher by 2.2% than the competitive tender, whereas the technical value of the contract is lower by 1%, the tenderer with higher price and higher technical value of the contract will be preferred.

5 Priority Services, Non-priority Services, and Construction Works

Irrespective of whether the object of the contract consists in public services (of priority or non-priority character), or construction works, non-price evaluation criteria related to tenders and their characteristics have to be clear and unequivocal.

Table 2 Weighing factors of evaluation criteria of the tender—example

Criterion	Weighing factor (%)
Gross price	40
Quality	30
Technical value	20
Lead time	10

Source: Own survey on the basis of the Ministry of Regional Development (2010)

Table 3 Weighing factors of evaluation sub-criteria of the tender as part of the quality criterion (30%)—example

Sub-criterion	Weighing factor (%)
Customer service (helpdesk, communication with the awarding entity)	5
Organisation of the team (division of roles, responsibilities of the members of the team, relevance as regards the aim of the project, coordination of the completion of the contract by the project manager, information flow in the team)	10
Organisation of quality control (quality assurance plan, quality control, four eyes principle)	10
Replacement of key personnel (vacation, sick leave, etc.)	5

Source: Own survey on the basis of the Ministry of Regional Development (2010)

Criteria can be additionally defined with the use of detailed sub-criteria—the latter, if not sufficiently clear, should be additionally described with the use of supplementing terms.

For example, Criterion: costs after the purchase of the product; Sub-criteria: costs of operation (operation materials, energy, handling), service, implementation (breaks at work, instructors, trainings etc.), maintenance (façade, building etc.). The awarding entity may freely specify the weighing factor of individual criteria (see Table 2).

If sub-criteria are applied, the awarding entity may assign relevant weighing factors to them (See Table 3).

As far as in case of measurable criteria points can be assigned to submitted tenders on the basis of arithmetic formulas, non-measurable criteria, i.e. aesthetics, comfort, and organisation of the undertaking. Quantification is necessary according to the level of meeting preferences of the awarding entity by the tenderer—each level should be described and a relevant number of points should be assigned (including fractions), for example 10 points (max.) means good/meets/complete/optimal, 5 points means satisfactory/partially meets/applicable/average, and 1 point (min.) means unsatisfactory/fails to meet/defective/unsuitable.

5.1 Priority Services

In the event of priority services, three evaluation criteria can be adopted, e.g. price, quality and technical value. As far as the price is concerned, gross price offered by the tenderer is evaluated. The quality criterion encompasses availability of key personnel (24 h a day, 365 days a year, response time, etc.), customer service (helpdesk, communication with the awarding entity), organisation of the team (division of roles, responsibilities of members of the team, relevance as regards the aim of the project, coordination of the completion of the contract by the project manager), organisation of quality control (quality assurance plan, quality control, four eyes principle), replacement of key personnel (vacation, sick leave, etc.), planned use of human resources, financial and material outlays of the awarding entity for the purpose of the completion of the contract.

The technical value criterion includes project schedule (completeness and specificity of the schedule resulting from a Gantt Chart), applied measures/procedures in order to keep the schedule, cohesion of planning individual parts of the contract in time with the proposed method of completion of the object of the contract; adequacy of the schedule and the applied measures/procedures in order to keep the schedule as regards the object of the contract, etc., method of completion of the contract (analysis of the contract indicating problems and threats connected with its completion, proposed solutions of the problems). Individual criteria are assigned the following weighing factors (in %) the aim of which is to evaluate tenders in Table 4.

In the event of the price criterion two example evaluation methods can be applied:

1. It can be assumed that the tender with the lowest price is granted 5 points, whereas the other tenders receive points according to the arithmetic formula: $(X/Y) \times 5$, where X —the lowest price, Y —the price of the evaluated tender.
2. It can be assumed that the tender with the lowest price is granted 5 points, tender with the highest price receives 1 point, whereas the other tenders receive points according to the arithmetic formula: $5 - 4[(Y - X) - (Z - X)]$, where X —the lowest price, Y —the price of the evaluated tender, Z —the price of the tender with 1 point.

The other method puts a great emphasis on price deviations, eliminating tenders with the highest prices; in case of the first method price differences between tenders are not so much important.

Table 4 Weighing factors of evaluation criteria of tenders in case of priority services—example

Price	Quality	Technical value	Other
30–50	20–30	20–30	5–10

Source: Own survey on the basis of the Ministry of Regional Development (2010)

5.2 *Non-priority Services*

If non-priority services are the object of the contract, it is possible to supplement previously analysed evaluation criteria by a criterion referring to the properties of the economic operator, i.e. experience, reliability, certificates held, qualifications of personnel, distance between the seat of the economic operator and the seat of the awarding entity, etc. Therefore, for the purpose of this example the following criteria with a detailed description have been adopted. As far as the price is concerned, gross price offered by the tenderer is evaluated.

The quality criterion encompasses availability of key personnel (24 h a day, 365 days a year, response time, etc.), customer service (helpdesk, communication with the awarding entity), organisation of the team (division of roles, responsibilities of members of the team, relevance as regards the aim of the project, coordination of the completion of the contract by the project manager), organisation of quality control (quality assurance plan, quality control, four eyes principle), replacement of key personnel (vacation, sick leave, etc.), planned use of human resources, financial and material outlays of the awarding entity for the purpose of the completion of the contract.

The technical value criterion includes method of completion of the contract (analysis of the contract indicating problems and threats connected with its completion, proposed solutions of the problems, adequacy of the method of contract completion to its object). The criterion related to experience encompasses experience of the economic operator in the completion of services similar to the object of the contract, experience of people who will take part in the completion of the contract upon the provision of services similar to the object of the contract, academic achievements of people who will take part in the completion of the contract (authors or co-authors of monographs or scientific publications in the reviewed magazines). Individual criteria are assigned the following weighing factors (in %) the aim of which is to evaluate tenders as in Table 5.

In the event of the price criterion, methods analogical to those related to priority services can be applied. The evaluation of the tender as part of the experience criterion is made on the basis of documentation confirming qualifications, experience, education of people who will take part in the completion of the contract/staying at the disposal of the economic operator, the scope of activities performed by individual persons, the list of services performed and being performed—in case of periodical or continuous services, corresponding to the type and value of these being the object of the contract.

Table 5 Weighing factors of evaluation criteria of tenders in case of non-priority services—example

Price	Quality	Technical value	Experience	Other
30–50	20–40	10–30	10–30	10–20

Source: Own survey on the basis of the Ministry of Regional Development (2010)

5.3 Construction Works

If the object of the contract refers to the design and performance of construction works, it is possible to apply the criterion of aesthetic and functional properties. Therefore, for the purpose of this example the following criteria with a detailed description have been adopted. As far as the price is concerned, gross price offered by the tenderer is evaluated.

The technical value criterion includes the quality guarantee period, project completion schedule (completeness and specificity of the schedule resulting from a Gantt Chart, applied measures/procedures in order to keep the schedule, cohesion of planning individual parts of the contract in time with the proposed method of completion of the object of the contract), method of completion of the contract (analysis of the contract indicating problems and threats connected with its completion, proposed solutions of the problems, adequacy of the method of contract completion to its object, the use of state-of-the-art techniques and technologies, limited disturbances in the activity of the awarding entity/traffic problems).

The criterion related to environmental aspect encompasses consumption of energy (summed up power of individual devices being elements of the construction structure or network). Aesthetic and functional aspects include functionality of solutions (organisation of internal function of the building and communication routes, legibility of the main function of the premises expressed in an architectural form of designed premises, functional explicitness and legibility of individual elements of the premises, explicitness and legibility of functional forms having impact on spatial arrangement of entrances and segregated internal spaces, proposed land development taking into account communication routes, connection of the new building with the existing buildings), appearance (harmony, colours, use of finishing materials adequate to the function and place), incorporation in the surroundings (adjusting architectural form to the neighbouring land development and the arrangement of greenery)—innovativeness and originality of adopted architectural solutions.

Individual criteria are assigned the following weighing factors (in %) the aim of which is to evaluate tenders as in Table 6.

Table 6 Weighing factors of evaluation criteria of tenders in case of construction works—example

Criterion	Price	Technical value	Environmental aspects	Aesthetic and functional properties	Other
Simple order	70–80	0–15	0–5	5–10	0–10
Average order	60–70	5–20	0–5	10–20	0–10
Submitted order	40–50	10–30	0–5	10–30	0–10

Source: Own survey on the basis of the Ministry of Regional Development (2010)

In the event of the price criterion, methods analogical to those related to priority and non-priority services can be applied. In the event of a sub-criterion of technical value—the quality guarantee period—the evaluation can be made in the following manner: The tender with the longest quality guarantee period is assigned 5 points; tenders with a minimum quality guarantee period established by the awarding entity (or alternatively the tender with the shortest quality guarantee period) receive 1 point; the other tenders receive points according to the arithmetic formula: $5 - 4 [(X - Y)/(X - Z)]$, where X —the longest proposed quality guarantee period, Y —the quality guarantee period offered in the evaluated tender, Z —the minimum quality guarantee period established by the awarding entity (or alternatively the shortest offered quality guarantee period).

In case of aesthetic and functional properties, the tender is evaluated on the basis of submitted architectural documentation.

6 Conclusion

From the point of view of the awarding entity applying various criteria of selecting tenders in the contract award proceedings, it is essential to select as economically effective tender as possible. The aforementioned deliberations show that indisputably this goal can be obtained by the awarding entity by way of selecting the most economically advantageous tender, i.e. the criterion of price or costs of the contract in relation to other factors that are crucial from the point of view of the awarding entity. The value of goods purchased as part of a public contract by the awarding entity is affected, apart from price and costs, specific features of such goods or other inter-related factors, relevant in a given case for the awarding entity. The use of the criterion of selecting the most economically advantageous tender by the awarding entity in their contract award proceedings and at the same time providing economic operators with the information concerning such factors that decide about the value of goods of services purchased by the awarding entity cause that individual economic operators, whose aim is to make their tender successful, will do their best to meet the additional criteria provided by the awarding entity. This in turn, thanks to making the content of the tender concrete, will translate into preparation of tenders meeting high economic effectiveness evaluated from the point of view of additional criteria that are essential for the awarding entity. Trying to win in the tender procedure in which the criterion of the most economically advantageous tender is applied, individual economic operators will strive at maximisation of the value of their goods from the point of view of crucial needs of the awarding entity and with simultaneous limitation of the price of offered goods or services and other costs connected with the object of the contract. It may result in active rivalry of economic operators with the use of economic effectiveness of submitted tenders, while finally the most economically advantageous tender will be selected by the awarding entity, meeting all criteria defined by the latter. In consequence, the value of goods and services purchased, evaluated from the point of view of the criteria relevant for the awarding

entity, taking into account emphasis put on them, will be thereby as high as possible, not causing at the same time unproportional increase in the price paid for such goods or services and other costs related to such contract (Szydło 2014).

On the basis of deliberations made, other additional factors, apart from price and costs of the contract (i.e. remuneration given by the awarding entity to the economic operator in return for goods or services purchased), that have significant influence on the selection of the tender by the awarding entity on the basis of the criterion of the most economically advantageous tender, depending on the nature of goods or services awarded, the following can be listed: their quality, including technical value, aesthetic and functional properties, usefulness, general availability, supply conditions, including date, method and duration of supply, lead time of the whole contract, organisation as well as qualifications and experience of people performing a given contract, having essential impact on the level of execution of the contract, as-built service, and further technical assistance, social, environmental and innovative properties, and the so-called life cycle of goods or services, i.e. prices and costs incurred by the awarding entity and by the whole society during the whole life cycle of goods or services purchased, such as the costs of use of goods (consumption of energy and other resources), cost of maintenance, costs connected with withdrawal from the operation (such as the costs of collecting and recycling), as well as the costs assigned to ecological external effects connected with given goods during their life cycle (e.g. the costs of emission of greenhouse gases and other pollutions and other costs related to climate change mitigation).

However, it should be mentioned that the need to ensure execution of additional factors influencing the criterion of selecting the most economically advantageous tender may often increase the price of goods or services purchased, and at the same time not necessarily increase their value from the point of view of the needs of the awarding entity. It will be the case when their realisation by a given economic operator will be in no event connected with the object of purchase. In such event they should not be taken into account by the awarding entity in the assessment of the value of given goods purchased, even if theoretically these benefits could be taken into account as part of criteria of selecting the tender. The price paid for the object of the contract may increase then while the economic operator, willing to meet additional criteria not related with it, will incur their costs but without simultaneous increase in the value of the object of the contract itself from the point of view of the awarding entity. This in turn will lead to decreased economic effectiveness of purchase of given goods below the level of optimal effectiveness that could be obtainable if the aforementioned factors were not realised at all as part of the public award procedure (Miceli 2009; King 2012). Therefore, it is so important for all other factors characterising the object of the contract being related to its price or costs were relevant for the awarding entity, having real value for the awarding entity.

Moreover, selecting the tender on the basis of the criterion of the most economically advantageous tender, one has to take into account the fact if legal norms related to public procurement, obliging or stimulating the awarding entities to choose such criterion, can at the same time properly secure the performance of terms and conditions of the contract by the economic operator that has undertaken to

provide the awarding entity with goods of high value, at a low price or low costs as declared in the tender. From the point of view of the purpose of public procurement, it would be completely counterproductive if the awarding entity selected the tender with the use of the criterion of the most economically advantageous tender, and afterwards the economic operator would not be able to meet such criterion. Therefore, it is important that the public procurement law included legal instruments that allow for prior review of whether a given economic operator is technically and economically able to perform the contract at the terms and conditions agreed and anticipated by the awarding entity.

Summing up deliberations concerning the characteristics of the criterion of the most economically advantageous tender, it is worth emphasising that maximisation of economic effectiveness of purchase made by the use of the aforementioned criterion seems to be very advantageous. First, needs of the awarding entities are met in a better and complete manner and they often correspond to public needs, and second, sometimes it allows for more economical and rational spending of funds being at the disposal of the awarding entities, allocated for public contracts. This in turn enables them to allocate funds in a more optimal manner from the point of view of general social level of welfare, which is essential for whole societies.

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