Edited by
Paola De Vincentiis · Francesca Culasso
Stefano A. Cerrato

The Future of Risk Management, Volume I

Perspectives on Law, Healthcare, and the Environment

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Editors
Paola De Vincentiis
Department of Management
University of Turin
Turin, Italy

Francesca Culasso
Department of Management
University of Turin
Turin, Italy

Stefano A. Cerrato
Department of Management
University of Turin
Turin, Italy

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Preface

Risk and uncertainty affect all human activities, bear on all decisions and shape our everyday experience. In the managerial field the attention devoted to risks of all types and to risk management has been increasing steadily ever since the seventies due to the heightened volatility of the macroeconomic and financial environment, the enhanced speed of transactions and the deep systemic interconnectedness of national economies. Both practitioners and academic researchers devote significant time and effort on improving their knowledge, skills and understanding of risk evaluation and management.

Following the wave of this strenuous effort, in these two volumes we collected a selection of research papers presented during the Second International Conference on Risk Management organized at the University of Torino on the 25–26 October 2018. The ambition of the event was to bring together many different perspectives on risk management, without confining the scope to a particular sector, activity or issue. The result of this opening was brilliant. Plenty of contributions were selected by the Conference organizers and rich discussions developed in numerous parallel sessions. The best papers—chosen on the basis of a blind peer-review process—were invited to take part in this publication which is subdivided into two volumes.

This first volume has a public management focus, whereas the second is more related to issues faced by companies, intermediaries and investors in the private sector. More in particular, the first volume is divided into three parts. Part I deals with **Environmental Risk Management**

and it is aimed at analysing the management of the environmental risks under different perspectives and the scientific, managerial and physical tools able to cope with them. Part II is focused on **Risk Management in the Public and Health Sector**. Two drivers that are particularly analysed in this area are the dangers related to corruption in the public sector and the need to safeguard patients' safety when organizing health services. Part III deals with fiscal policies and discusses the **Interactions Between the Risk Management and Tax Law**, both from a domestic and comparative perspective. The research focus is on the scheme commonly known as "Co-operative Compliance procedure" and on the consequences that it may have on the internal structure of multinational businesses.

Turin, Italy

Paola De Vincentiis
Francesca Culasso
Stefano A. Cerrato

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List of Contributors

Simona Alfiero Department of Management, University of Torino, Turin, Italy

Ilaria Angela Amantea Computer Science Department, University of Turin, Turin, Italy

Gabriella Arcese Department of Business Studies, Roma Tre University, Rome, Italy

Fabrizio Bert Department of Public Health Sciences, University of Turin, Turin, Italy

Alberto Bertello Department of Management, University of Turin, Turin, Italy

Paolo Pietro Biancone Department of Management, University of Turin, Turin, Italy

Valerio Brescia Department of Management, University of Turin, Turin, Italy

Valter Cantino Department of Management, University of Torino, Turin, Italy

Teresa Capasso Clinical Risk Management Unit, University Hospital Città della Salute e della Scienza of Turin, Turin, Italy

Gianluca Capecci Department of Management, University of Torino, Turin, Italy

Ilaria Ciliberti University of Torino, Turin, Italy

Maurizio Cisi Department of Management, University of Torino, Turin, Italy

Daniela Conte University Parthenope, Naples, Italy

Laura Corazza Department of Management, University of Torino, Turin, Italy

Paola De Bernardi Department of Management, University of Turin, Turin, Italy

Antonio Di Leva Computer Science Department, University of Turin, Turin, Italy

Alfredo Esposito Department of Management, University of Torino, Turin, Italy

U. Fiandra Clinical Risk Management Unit, University Hospital Città della Salute e della Scienza of Turin, Turin, Italy

Canio Forliano Department of Management, University of Turin, Turin, Italy

G. Fornero Clinical Risk Management Unit, University Hospital Città della Salute e della Scienza of Turin, Turin, Italy

Chiara Francioso School of Law, University of Milano-Bicocca, Milan, Italy

Anna Guerrieri Sham, Rome, Italy

Daniel Iannaci Department of Management, University of Turin, Turin, Italy

Daniela Ivanova Department of Natural Resource Economics, University of National and World Economy, Sofia, Bulgaria

Dessislava Kotcheva Department of Natural Resource Economics, University of National and World Economy, Sofia, Bulgaria

Maria Claudia Lucchetti Department of Business Studies, Roma Tre University, Rome, Italy

Andrea Martra Department of Management, University of Turin, Turin, Italy

Olimpia Martucci Department of Business Studies, Roma Tre University, Rome, Italy

Chiara Montauti Department of Business Studies, Roma Tre University, Rome, Italy

Maria Pia Nastri Faculty of Law, University Suor Orsola Benincasa, Naples, Italy

Vincenza Palermo ASL TO 4, Ivrea, Italy

A. Paudice Clinical Risk Management Unit, University Hospital Città della Salute e della Scienza of Turin, Turin, Italy

I. M. Raciti Clinical Risk Management Unit, University Hospital Città della Salute e della Scienza of Turin, Turin, Italy

Maha Radwan Department of Management, University of Turin, Turin, Italy

Francesca Ricciardi Department of Management, University of Turin, Turin, Italy

Stefano Maria Ronco Department of Legal Studies, University of Torino, Turin, Italy

Rebecca Rotti Department of Management, University of Turin, Turin, Italy

José A. Rozas Faculty of Law, University of Barcelona, Barcelona, Spain

Ronald Russo Tilburg University, Tilburg, The Netherlands

Silvana Secinaro Department of Management, University of Turin, Turin, Italy

Enza Sonetti Faculty of Law, University of Barcelona, Barcelona, Spain; Faculty of Law, University Suor Orsola Benincasa, Naples, Italy

E. Sorano Department of Management, University of Turin, Turin, Italy

Emilio Sulis Computer Science Department, University of Turin, Turin, Italy

Vania Tradori Department of Management, University of Turin, Turin, Italy

Harm van den Broek Radboud University Nijmegen, Nijmegen, The Netherlands

Erica Varese Department of Management, University of Torino, Turin, Italy

Francesco Venuti ESCP EUROPE, Paris, France

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PART I

Environmental Risk Management

Part I "**Environmental Risk Management**" contains the contributions presented in the same name round table, which aimed at analysing the management of the environmental risks under different perspectives and the scientific, managerial and physical tools able to cope with them.

The evaluation and management of environmental risks and their economic impacts ask for the cooperation of multicultural research groups, which work together to share and integrate methodologies. In this view, Part I contains six chapters related to different economic fields and case histories that have allowed enriching the round table debate.

The Authors take into consideration the managerial perspective in assessing and managing risks, the financial and non-financial disclosed of risks and the role that new technologies or new processes may play in monitoring operational situations and detecting data in order to identify trends and the existence of potential risks.

Chapter 1, by Cantino et al., analyses an important economic sector, the Italian bus transportation, in achieving a business sustainability, testing the relative efficiency relying on accounting, technical, environmental and governance variables for the risk of the sector on the year 2010.

In Chapter 2, Ivanova and Kotcheva present a case study of household waste management process in a specific case history, the municipality of Ruse in Bulgaria, in involving the private companied in the detect and transportation of urban garbage, through direct individual interviews among 103 companies holding waste permits.

Chapter 3, by Varese and Ronco, intends to analyse some tools introduced in the EU customs strategy for improving import and export activities at EU level and, at the mean time, focusing on some mechanisms and tools adopted by quasi-public entities entrusted with the responsibility to carry out import–export formalities in extra-EU countries.

De Bernardi et al., furthermore, explore how and to what extent the biggest Italian nonfinancial companies of the FTSE-MIB disclose on climate change risk, analysing 25 Italian listed companies for 2017, pointing out that even if there has been an increase in climate-related risk disclosure, the items are still underdeveloped.

Lucchetti et al., moreover, present a framework for the identification of the hotspot in business activities, based on qualitative analysis of different kind of sources as literature review and case studies.

Finally, the last contribution, by Cisi et al., encompasses a systematic literature review on environmental risk management (ERM) seen through the lenses of the different theories of management, in order to elucidate their intersections and differences, alongside creating a study to aid the widespread of knowledge.

The result of the contributions shows that the facets of the concept of environmental risk require different methodological approaches, but that it is essential to deal with the issues in a systemic way to find effective and robust solutions.

Riccardo Beltramo
Stefano Duglio

CHAPTER 1

The Italian Bus Transportation Sector: The Management of Environmental Risks as a Factor for Achieving a Business Sustainability

Simona Alfiero, Valter Cantino, Gianluca Capecci and Alfredo Esposito

1.1 Introduction

The topic of public transport is of significance because of its being directly linked to the quality of life of citizens, in terms of fast transfers and reducing of CO_2 emission. The quality of local public transport

S. Alfiero (✉) · V. Cantino · G. Capecci · A. Esposito
Department of Management, University of Torino, Turin, Italy
e-mail: simona.alfiero@unito.it

V. Cantino
e-mail: valter.cantino@unito.it

G. Capecci
e-mail: gianluca.capecci@unito.it

A. Esposito
e-mail: alfredo.esposito@unito.it

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is significantly reflected in the country's competitiveness as inadequate urban and peri-urban mobility imposes additional costs on citizens. The European Parliament has also expressed great attention to the issue of public transport in urban areas, underlining the need to give more emphasis to this aspect and proposing to add another objective to the 10 already stated in the strategy outlined in the White Paper "Roadmap to a Single European Transport Area—Towards a competitive and resource efficient transport system" [COM (2011) 144 final][1] and consisting in doubling use of public transport in urban areas by 2030, also in order to achieve the 60% greenhouse gases (GHG) emission reduction target by 2050 with respect to 1990. Investing in public transport could lead to significant benefits in terms of economic growth, social cohesion, innovation, employment and sustainable development. The energy consumption, referred to kilometres and passengers, are influenced by size and type of service, urban or suburban, mode and means of transport and characteristics of the vehicles. Anyway, the energy consumption of public transport, being equal number of passengers, is much lower than those of private mobility. A turnover of over 12 billion euros a year, more than 1000 active firms, over 126 thousand employed and 5.2 billion passengers transported each year: this is the local public transport in Italy.

According to data of the European Union (EU transport in figure—statistical pocketbook 2017[2]), in Italy public transport satisfy about 19% of the mobility needs of citizens on land, that is slightly higher than the European average (18,8%). Compared to the latter, however, in the Italian system the largest percentage is ensured by road transport (buses and coaches—12.2% in Italy compared with 9.4% as EU average) compared with those on railways (trains, tram and metro—7.0% in Italy compared with 9.4% as EU average). Furthermore, the buses and coaches used in Italy have a higher average age (11.4 years) than that of the other European countries (for instance, in France, Spain and UK they reach a maximum of eight years, while in Germany the average age is 6.9 years). All above means that in Italy are used means of transport that pollute more (buses and coaches compared to railways), also because they are old and are not equipped with the most recent anti-pollution devices.

In this view, carbon footprint measures the level of energy efficiency and it shows how much a firm is working to improve its results.

[1] https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0144:FIN:en:PDF.

[2] https://ec.europa.eu/transport/facts-fundings/statistics/pocketbook-2017_en.

Reducing carbon emissions, on the one hand, could allow saving money—for instance, reducing the consumption of fossil fuels—but, on the other hand, it costs, as when it is necessary to develop new technologies.

In Italy, public transport sector has suffered years of low investments both on vehicles and on roads, due to the prolonged economic crisis and the unfavourable economic situation of recent years. In the past, many local transport companies (as in many European countries) were under public ownership or carried out service without a tender concession. Moreover, fares were permanently lower than average costs and, as consequence, many firms had financial distress. Recently, in Italy, some Regions have started a process of aggregation of companies on a territorial basis with the aim of overcoming fragmentation of management among different operators, in addition some international operators are taking over from national operators in the urban and extra-urban service mainly in the North. The Italian experience in public transport is still evolving and far from finding a definitive solution for the efficiency, as the challenges for the companies in that sector do not have an only way to be won.

In Sect. 2 we trace a brief note on the Italian bus transportation sector and a theoretical background while Sect. 3 focuses on methodology and data specifications. Section 4 focuses on the sectorial efficiency findings and results. Section 5 highlights conclusions and remarks.

1.2 Theoretical Background and a Brief Note on the Italian Bus Transportation Sector Legislative Framework

In order to take into consideration environmental risks, with regard to the environmental impact of means of transport, Cowart et al. (2003) described GHG emissions from different perspective in the US, also by trip purpose and economic activity area (e.g. freight mode, commodity carried and public passenger transportation). Preston et al. (2013) provided some analysis of the distribution of carbon emissions across households, including emissions resulting from travel by private vehicle, public transport and aviation and explored the distribution and underlying drivers of CO_2 emissions from land-based passenger transport in Great Britain, focusing, in particular, on the accessibility of local services and public transport to households in affecting household emissions. Geurs and van Wee (2004) founded, studying freight and passenger transport

in the Netherlands that strategies to achieve substantial reductions in emissions would reduce inequalities in the costs and benefits of transport, differences in travel behaviour, accessibility of economic and social opportunities and quality of life among societal groups will be less pronounced. Woodcock et al. (2009) used Comparative Risk Assessment methods to estimate the health effects of alternative urban land transport scenarios for two settings in 2030 (London, UK and Delhi, India), founding that policies to increase the acceptability, appeal and safety of active urban travel, and discouraging travel in private motor vehicles would provide larger health benefits than would policies that focus solely on lower-emission motor vehicles. Due to the above-mentioned features of studies, obviously among many others, hence the link between environmental risks and economic performances is fairly clear.

The transportation sector efficiency has been widely investigated by means of Data Envelopment Analysis (DEA) as a non-parametric technique mostly on the airport, airlines and international container ports around the world and less on the Local Bus Transportation. As main assumption, it is of significance the fact that the local bus transportation system helps the citizens' mobility within the municipal area, while its importance is increasing as a consequence of the working life dynamics. Timilsina and Shrestha (2009) states that economic growth and transport energy intensity are the principal factors in Latin American and Caribbean (LAC) and Asian countries while Andreoni and Galmarini (2012) originate a similar conclusion about the greater role played on the economic growth and in contributing to CO_2 emissions in EU27 and ASEAN-5 economies. The confirmation of the relevance of the urban transportation system resides in the changing of lifestyles and work patterns because of residential areas, businesses relocation and university faculties creating out-of-town campuses are asking for greater need to which public transportation shell provide. Often there has been a great focus on the economic outcomes of transportation issues along with less consideration focused on social and environmental aspects as CO_2 emissions. The Public Transport System should be run efficiently as well as with a special regard to the environment reducing, for instance, the CO_2 emissions and rising the need for the environmental issue that needs to be analysed and measured (Carpenter 1993).

Of course it is of some significance to consider that many local transportation companies in Italy (as well as in many European countries) are still under a form of monopoly protection by means of non-tendered

concessions or public ownership. Current evidences are highlighting the fact that its financial performances are deteriorating since many years even if publicly owned companies' cannot let being in bankruptcies (Boycko et al. 1996) and the confirmation is to be highlighted from years by researchers that investigated on the influence of firm ownership structure affecting the performance (e.g. Jensen and Meckling 1976; Fama and Jensen 1983).

In Italy, the bus transportation sector still plays a great influence on local territory economies because of the nature of the Italian territories that does not allow for a kind of economic appeal while in the French experience there are doubts on the efficiency properties of competitive tendering because it has been said that "competition has not been fostered and the performance indicators are still mediocre, not to mention the fact that collusion still exists" (Yvrande-Billon 2006). As a consequence the willingness of local authorities to spread the efficiency of the public-owned companies on the market is a sort of "chimera" depending on willingness to give up political rents accruing from the ownership of local public enterprises. The national government shell strengthens the "propensity to competition" of local authorities by setting appropriate financial sticks and carrots (Boitani and Tocci 2005). As per the study of Roy and Yvrande-Billon (2007) investigating the impact of ownership structures and contractual choices on technical efficiency in the French urban public transport sector is to be highlighted that the technical efficiency of urban public transport operators is influenced by the ownership regime and type of contract governing their transactions.

Furthermore, always to be recalled is the relevant role of the management because, from a managerial perspective, the "agency theory" as in Eisenhardt (1989) and Jensen and Meckling (1976) is relevant when referring to the separation of ownership and control thus implying conflicts of interests between managers and shareholders. On the other hand, the "stewardship theory" argues that managers are reliable and there are no agency costs as in Donaldson (1990) and Donaldson and Preston (1995).

Many studies analysed the urban transport service efficiency, with the use of non-parametric techniques. Studies through the DEA are wide spreading because the technique enjoyed great popularity in measuring environmental performance due to it providing of a synthetic environmental performance index when, among others, undesirable outputs are incorporated into the DEA model. Most of the previous studies

(Seiford and Zhu 2002; Knox Lovell et al. 1995; Zhou et al. 2007; Färe et al. 1989) utilised a traditional radial and input-oriented assumption assuming that all the input factors should be reduced proportionally to be efficient even if other assumptions were added or changed into different assumptions. On the other hand, De Borger et al. (2002) delivered a survey of literature on production frontiers for transit operators founding that many important issues remain unresolved, such as the specification of outputs or the characteristics behind the control of the operators while Karlaftis (2004) presented a review of papers analysing the performance of transportation systems.

Since Tomazinis (1977) the parameters in order to measure public transport systems and defined some simple concepts for evaluating them, like efficiency, productivity and service quality are analysed as well as in Fielding et al. (1985) which provides many parameters that could be used to assess performance, and put them into three categories: efficiency, effectiveness and overall performance (which included the first two). Among other dimension Afonso and Scaglioni (2005) included the transportation dimension in their non-parametric analysis of the public services efficiency provision in Italian regions while Margari et al. (2007) providing evidence on the determinants of input-specific efficiency differentials across companies, pointed out that managerial skills play a minor role, emphasising the significance of regulatory policies in replacing cost-plus subsidisation and improving environmental conditions of public transit networks.

Shiau and Jhang (2010) investigated the Taiwanese transportation sector from 1993 to 2007 and its sustainability evidencing that, in order to follow a sustainable development three cores indicators as service impact, cost efficiency and service reduction are needed to reach a good performance. Moreover, Leal et al. (2012) researching on the Brazilian bioethanol transportation modes systems—Eco-efficiency applied DEA for measurement of eco-efficiency as an outcome indicating that, the use of DEA created the rules to increase the transportation modes that were not measured 100% relatively eco-efficient. The environmental efficiency analysis of transportation system in China by Chang et al. (2013) shows that most of the China provinces do not have an eco-efficient transportation industry being inefficient and that is "*still difficult to measure the shadow price of undesirable outputs*" (Zhou et al. 2007).

Recently, the literature review of Abrate et al. (2016) pointed out that economies of scale is real only for the companies providing multiple bus

services (urban, intercity, charter/for hire) while the Daraio et al. (2016) literature review provide a discussion on the prevailing empirical studies according to the utilised methodological assessing the classification of the inputs, outputs, kinds of data analysed, and policy-relevant questions as well as the investigation of their interrelationships. A further comprehensive review of DEA approach in energy efficiency has been presented by Mardani et al. (2017). A review of 144 published scholarly papers appearing in 45 high-ranking journals between 2006 and 2015 have been obtained to achieve a comprehensive review of DEA application in energy efficiency. Accordingly, the selected articles have been categorised based on year of publication; author(s) nationalities, scope of study, time duration, application area, study purpose, results and outcomes. Results of this review paper indicated that DEA showed great promise to be a good evaluative tool for future analysis on energy efficiency issues, where the production function between the inputs and outputs was virtually absent or extremely difficult to acquire.

On the side of the legislative framework, the Italian one of the local public transportation sector was introduced at the end of the 1990s. Based on the legislative criteria contained in the law n. 59 of 1997,[3] two legislative decrees were issued; specifically the n. 422[4] of the same year and n. 400 of 1999.[5] In particular, with the legislative decree n. 422 of 1997 the competence regarding local public transport has been transferred to regions and other local authorities (provinces, boroughs, rural communities, etc.). It had foreseen that the operation of regional and local public transport services, in any manner performed and in any form entrusted the management to them, should be regulated by service contracts of no more than nine years. For the awarding of services, the regions and local authorities, however, had to respect some common principles, including the obligation to conduct a tender and the determination of tariffs with the application of the price cap method. The law provided for the full operation of this mechanism at the end of a transitional period that initially should have been concluded in December 2003 but was then extended on several occasions until December 2009.

[3] Law n. 59 of 1997 published in G.U. n. 63 of 1997.

[4] Legislative decree n. 422 of 1997 published in G.U. n. 287 of 1997.

[5] Legislative decree n. 400 of 1999 published in G.U. n. 259 of 1999. With this legislative decree modification to text of the previous decree n. 422 of 1997 were introduced.

In 2007 Regulation (EC) n. 1370 of the European Parliament and of the Council of 23 October 2007,[6] aimed at regulating the "public transport services by rail and by road", was approved. This Regulation considers, with effect from 3 December 2019, three possible methods of awarding the service: (a) open tender; (b) direct management; (c) direct contracts to in house company within set thresholds. The Italian legislator, with article 61 of the Law n. 99/2009,[7] allowed the use of all three methods of awarding public transport services provided by the European regulations, expressly granting to the competent authorities, the right to directly award service contracts, also by way of derogation from the sector regulations.

Hereafter, the legislation concerning public transport in Italy was subject to several changes and additions in order to improve efficiency and competitiveness: with Decree Law n. 138 of 2011[8] (art. 3-*bis*), regions have to establish the perimeter of the optimal and homogeneous territorial areas to allow economies of scale and maximise the efficiency; with Decree Law n. 201 of 2011[9] (art. 37), the Transport Regulatory Authority (ART) has been established, which is responsible for the sector and, in particular, for access to related infrastructures and accessory services; with Decree Law n. 179/2012[10] (art. 34, p. 20), the local authority that award the service has to publish on its internet site a special report giving an account of the reasons and the existence of the requisites established by the European law for the chosen form of awarding and defining the specific contents of the public service and universal service obligations, indicating the economic compensation if foreseen; with Law n. 208 of 2012[11] (art. 1, p. 301), the National Fund for the State Financial Contribution to costs of local public transport, including rail, in regions with ordinary statute is established; with Law n. 147 of 2013[12] (art. 1, pp. 84 e 85), the determination, by means of Ministry of infrastructures

[6] Regulation (EC) n. 1370/2007 published in the Official Journal of the European Union L. 315 of 2017. This Regulation was after amended by Regulation (EC) 2016/2338.

[7] Law n. 99 of 2009 published in G.U. n. 176 of 2009.

[8] Decree Law n. 138 of 2011 published in G.U. n. 216 of 2011.

[9] Decree Law n. 201 of 2011 published in G.U. n. 300 of 2011.

[10] Law n. 179 of 2012 published in G.U. n. 294 of 2012.

[11] Law n. 208 of 2012 published in G.U. n. 302 of 2012.

[12] Law n. 147 of 2013 published in G.U. n. 302 of 2013.

and transport decree, with criteria of uniformity at national level, of the standard costs of local and regional public transport services as well as of the criteria for their updating and application is dictated.

In 2016, a legislative decree was drafted containing the rules on local public services of general interest, including public transport services, but it was not issued and some regulations were merged into subsequent measures. Finally, with Decree Law n. 50 of 2017,[13] several modifications to the legislation of local public transport have been introduced, in particular on the methods of awarding the services and on the choice of the contractor, on the economic compensations, on the levels of the services, as well as on the determination of the territorial areas, in order to improve the efficiency. The rules for the distribution of the National Fund for the State Financial Contribution to costs of local public transport resources has been modified with the aim of encouraging the use of public tender. The Authority for the regulation of transport has been entrusted with new tasks, like defining general rules referring to the procedures for the choice of the contractor for the assignment of local and regional public transport services.

Meanwhile, in order to align the vehicle fleet for local and regional public transport with European standards, the Italian legislator: (a) has established, with Law n. 208 of 2015[14] (art. 1, p. 866), a Fund to finance the replacement of the vehicles; (b) has progressively limited the possibility of buying and using for the services the oldest and most polluting means of transport; (c) has introduced, with Legislative Decree n. 257 of 2016[15] (art. 18, p. 10), restrictions in the replacement of the vehicle fleet, also to be used in urban public transport, committing public entities to purchase a specific percentage of vehicles electric, hybrid or fueled by CNG or LPG.

After all, due to many controversial primary legislations at European level often contradicted by details introduced by the secondary legislation at National, Regional and local level, there is a confirmation of the fragmented nature of the framework arising critiques as also for the main critiques and concepts expressed by Christensen and Yesilkagit (2018)

[13] Decree Law n. 50 of 2017 published in G.U. n. 144 of 2017.

[14] Law n. 208 of 2015 published in G.U. n. 302 of 2015. With Decree Law n. 50/2017, some modifications to text of the Law were introduced.

[15] Legislative Decree n. 257 of 2016 published in G.U. n. 10 of 2017.

which pointed out the proliferation of administrative bodies at the international (e.g. the same at local level) and issues relating to bureaucratic autonomy, administrative behaviour and policy-making influence.

1.3 Methodology and Data Specifications

The DEA in the literature is widely believed to be a proper and powerful method suitable for the measurement of the performance measurement activities rather than traditional, econometric methods such as regression analysis and simple ratio analysis (Zhu 2014).

The DEA developed by Charnes et al. (1978) with the model Constant Return to Scale (CCR or CRS) was enhanced by Banker et al. (1984) with the Variable Return to Scale model (BCC or VRS) is a mathematical method using linear programming techniques to convert inputs to outputs with the purpose of evaluating the performance of comparable organisations or products. Multiple inputs and outputs are converted into measurable units (Thanassoulis et al. 1996) and after an efficiency score for every single DMUs (decision making units) with each DMU being free to choose any combination of inputs and outputs in order to maximise its relative efficiency and the score is the ratio of the total weighed output to the total weighed input that determines how efficient a DMU is in producing a certain level of output, based on the amount of input it uses, compared to similar DMUs. The DMUs that lies on the frontier of production possibilities are efficient while the DMUs located at a distance from the identified relative efficiency frontier are considered to be inefficient; the higher the distance from the frontier and the higher the relative inefficiency. A fully efficient DMU, under DEA methodology, receive an efficiency score of $\theta = 1$, while the DMUs scoring less than 1 are considered inefficient even if in different proportion.

A core advantage of DEA is the ability to accommodate a multiplicity of inputs and outputs with no a priori weights assumption (Sexton 1986) and Thanassoulis (1993) found that DEA outperforms regression analysis appears to be superior to standard financial ratios analysis (Iqbal and Molyneux 2005), while for Färe and Grosskopf (2000) the "black box" simply considers the inputs consumed and the outputs produced. As pointed out by Cooper et al. (2000), the DEA is applied to support the actions (and objects) previously assessed by other approaches.

The basic models identify two possible starting models: the output-oriented model and the input-oriented model in order to maximise or minimise the different projections of DMUs that are inefficient compared to efficient ones. The input-oriented model, which projects the DMUs on the efficient frontier by reducing all inputs and at the same time maintaining the output level constant is the case of this study because of its providing information on the operational and managerial side while the output-oriented model seeks for more strategic information. After having chosen the proper model and orientation, another relevant aspect refers to the variables selection. The variable must respect an initial condition regarding the number of inputs and outputs in relation to the number of DMUs. In this context, Golany and Roll (1989) postulate the "rule of thumb" for which the minimal number of DMUs for the selected model should be at least double the considered inputs number, while Bowlin (1998) mentioned the necessity of having a number of DMUs at least three times the sum of inputs and output. Ozbek et al. (2009) refer to this issue by considering the minimal number of DMUs (n) as: $n > 2$ m * s, where m is the number of inputs and s is the number of outputs.

The efficiency measure is associated to the use of a minimum number of inputs in order to produce a certain number of outputs or the maximum production of outputs using a certain number of inputs (Fethi and Pasiouras 2010). The VRS model scores the pure technical efficiency also called managerial efficiency by including the so-called convexity constraints by changing the specification of the problem and providing the measure of Managerial Efficiency θ VRS adding $e\lambda = 1$ to the programme (where θ is a scalar and λ is a vector of constants). The measure of the scale efficiency is the ratio of CRS efficiency scores to VRS efficiency scores meaning that is equal to CRS score$/VRS$ score. The lower the scale efficiency is, the higher the impact of scale size (Thanassoulis 2001). This study refers to DEA as per Charnes et al. (1978) and Banker et al. (1984) in a Slack Based Model (SBM) as per the Tone (2001). The linear programme is the following:

$$\begin{aligned} \min_{t,\lambda,S,Z} \tau &= t - P_c Z \\ t + P_y S &= 1 \\ x_0 &= X\lambda + Z \\ y_0 &= Y\lambda - S \\ \lambda \geq 0, S \geq 0, z &\geq 0 \end{aligned} \tag{1.1}$$

where x_0 is the vector of actual inputs under evaluation, X is the costs matrix of banks sample, Z is the vector for inputs excesses, y_0 is the vector of firms outputs under evaluation, Υ is the matrix with the outputs of all the firms sample, S is the vector with the output slacks, λ is the vector of intensity and P_c and P_y are the vectors that contains weights.

The result of the linear programme solution (1.1) is τ, the relative efficiency of a DMU (company), where $(1-\tau)$ is Technical Inefficiency: the averaged distance from the Constant Returns to Scale frontier, it includes both Managerial and Scale Inefficiency. The first depends directly on the management while the second is due to the dimension of the company. A company is efficient and has an optimal dimension $\tau=1$. The Managerial Inefficiency $(1-\tau_{vrs})$ is due to the management, being the averaged distance from the Variable Returns to Scale frontier. The Scale Inefficiency is due to the dimension, so generally in the short run, the management does not have enough discretion to fill this gap.

As previously mentioned, the DEA efficiency studies on bus transportation are relatively few since the Viton (1997) study on the efficiency of the US bus system and its application of DEA technique on 217 public and private companies using vehicles/distance in miles and passengers transported as outputs, and average speed, average age of fleet, miles travelled, fuel used, personnel employed in the transport service, maintenance personnel, administrative personnel, capital and costs as inputs variables. Among many others, more focused on the eco-efficiency analysis Yin et al. (2014) improved a DEA model to evaluate eco-efficiency analysis using environmental pollution as an undesirable output in 30 Chinese provincial capital cities. The study of De Gruyter et al. (2016) assessed the sustainability of urban public transport systems by adopting a quantitative measurement framework containing diverse sustainability indicators and comparing the aggregate sustainability performance of urban public transport of cities while examining the relative sustainability of selected cities in Asia and Middle East region. In order to measure the bus transportation efficiency, this study followed the Alfiero et al. (2018) ideas and part of the underlying idea on governance topics expressed in Alfiero et al. (2017) in order to cover the economic, technical, environmental and governance perspectives.

The data analysis covers the year 2010 and the data source is ASSTRA—Associazione Trasporti Report (2011). The enterprise that presented lack of reliable data were not included (Table 1.1).

Table 1.1 The sectorial sample dataset for the year 2010

Dataset sample	*2010*
Total enterprises	131
Public	98
Private	33

Table 1.2 The 2010 dataset descriptive statistics. Data in Mln. of €

Variables	*Type*	*Min*	*Max*	*Average*	*Std. Dev.*
Production costs (euros)	Inputs	559,779	1,356,703,558	57,112,297	136,451,211
Personnel (unit)		9	12,693	623.7	1295.2
Vehicles (unit)		7	2808	264.6	368.3
Total CO_2 emissions (Tonnes)		99	110,209	7678.1	12,899
Production value (euros)	Outputs	601,078	1,049,186,481	54,330,292	114,313,647
Passengers (unit)		20,000	670,270,000	25,956,107	66,942,943
Kilometres travelled		230,000	178,050,000	11,524,244	20,452,002

Source ASSTRA—Associazione Trasporti Report (2011)

Table 1.2 highlights the descriptive statistics of the chosen variables. The inputs are Production costs, the Personnel units, Vehicles and the Total CO_2 emissions. The outputs chosen are the Production Value, Passengers and Kilometres Travelled.

The variables table of inputs and output tried to adhere to what was pointed out by Daraio et al. (2016) in its review of papers that run efficiency analyses considering both productive efficiency and environmental issues (among others Chang et al. 2013; Fraquelli et al. 2004; Karlaftis 2003; Miller 1970; Starr McMullen and Dong-Won 2007; Oh et al. 2011; Yu and Fan 2006; Yu 2008) or service quality aspects (Hensher 2014; Mouwen and Rietveld 2013). In fact, this study tries to consider a kind of general evaluation framework formed by performance measures such as economic goals (cost minimization, given suitable output and quality constraints), operational performances of the transport system and its environmental impacts in terms of sustainability along the public vs private form of governance issues.

Table 1.3 The overall efficiencies over the year 2010

Enterprises	*CRS efficiency*	*VRS efficiency*	*Scale efficiency*
Overall	0.57439	0.64209	0.91444
Public	0.57255	0.64171	0.91418
Private	0.57985	0.64320	0.91522

1.4 Findings—Efficiency Results and Public Versus Private

Table 1.3 highlights the relative efficiency level over the year 2010 period under CRS, VRS and the SE overall efficiency as well as the aggregate level of Public and Private companies'.

Figures 1.1 and 1.2 shows, respectively, the visual relative efficiency level over the year 2010 under CRS, VRS and the SE efficiency as well as the aggregate level of Public and Private companies'.

Figure 1.1a and b, reflecting the CRS and VRS, makes visually clear that there are no great differences on the relative efficiency level of the Italian bus transportation companies among an overall overview and a consequent distinction on Public and Private ownership and governance. Indeed, there is no worst aggregate performance either in terms of pure technical efficiency (CRS), managerial efficiency (VRS) and in terms of dimensions as per the Scale efficiency.

Tables 1.4, 1.5 and 1.6 highlights, respectively, the descriptive statistics of the DEA SBM overall ($n = 131$), Public ($n = 98$) and Private companies ($n = 33$) Technical Efficiency (CRS), Managerial Efficiency (VRS) and Scale Efficiency Scores over the year 2010.

Table 1.7 highlights, respectively, the relative CRS, VRS and Scale inefficiency level over the year 2010.

Figure 1.2 shows the visual relative inefficiency level over the year 2010 under CRS, VRS and SE dimension as well as its aggregate level of Public and Private companies'.

Obviously, given the efficiencies results, no significant differences on inefficiencies are observed with respect to their being public or private on the technical, managerial and scale dimension. Figures 1.3 and 1.4 refer to the inputs side slacks of the Constant and Variable Return to Scale DEA models. This is to be considered as an excess amount of inputs that provides qualitative information.

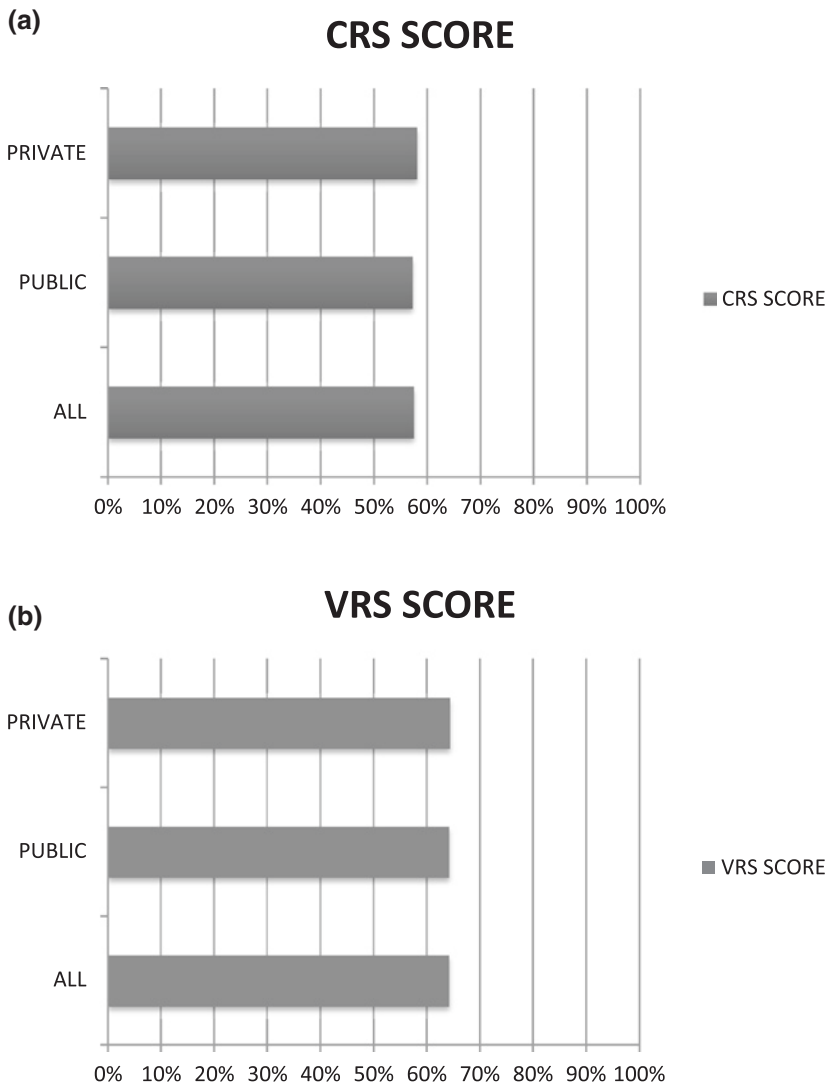

Fig. 1.1 The efficiency of Italian SBs over the 2010–2015 period on the base of two different perspectives

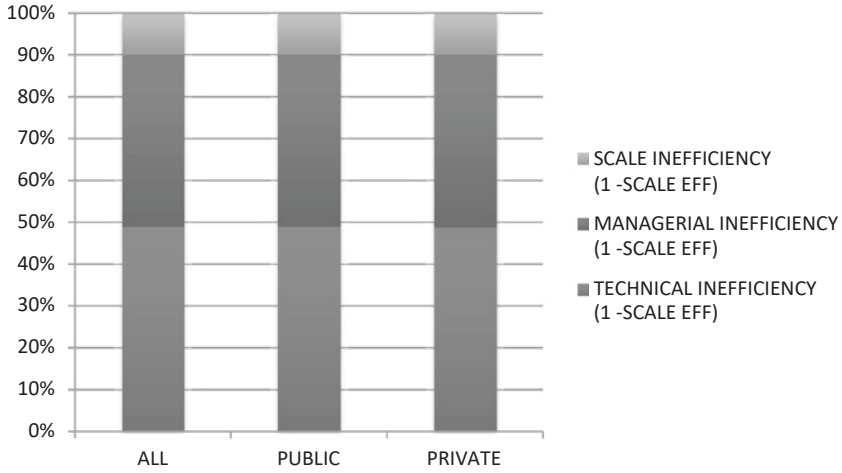

Fig. 1.2 The CRS, VRS and scale inefficiencies over the year 2010 (*Source* Own elaboration)

Table 1.4 The descriptive statistics of the DEA SBM 131 overall technical efficiency (CRS), managerial efficiency (VRS) and scale efficiency score

	CRS—Technical efficiency	*VRS—Managerial efficiency*	*Scale efficiency*
Mean	0.53699	0.56254	0.61784
Std. Dev.	0.34726	0.34092	0.41003
Min	0.18486	0.21097	0.13703
Max	1	1	1

Source Own elaboration

Table 1.5 The descriptive statistics of the DEA SBM 98 public companies technical efficiency (CRS), managerial efficiency (VRS) and scale efficiency score

	CRS—Technical efficiency	*VRS—Managerial efficiency*	*Scale efficiency*
Mean	0.53725	0.56504	0.61863
Std. Dev.	0.34600	0.33872	0.40863
Min	0.18377	0.21367	0.14045
Max	1	1	1

Source Own elaboration

Table 1.6 The descriptive statistics of the DEA SBM 33 private companies technical efficiency (CRS), managerial efficiency (VRS) and scale efficiency score

	CRS—Technical efficiency	*VRS—Managerial efficiency*	*Scale efficiency*
Mean	0.53983	0.56157	0.62613
Std. Dev.	0.34546	0.34272	0.40758
Min	0.19079	0.20598	0.12841
Max	1	1	1

Source Own elaboration

Table 1.7 The technical, managerial and scale inefficiencies[a] over the year 2010

Enterprises	*CRS inefficiency*	*VRS inefficiency*	*Scale inefficiency*
Overall	0.42561	0.35791	0.08556
Public	0.42745	0.35829	0.08582
Private	0.42015	0.35680	0.08478

[a]The inefficiency decomposition (Patrizii and Resce 2015)

As per Fig. 1.3 the input excesses are particularly significant on the CO_2 emission side along with some significance on the Vehicles and Personnel side.

Given the result of Fig. 1.3, Fig. 1.4 highlights and confirms with more significance the level of input excesses on the CO_2 emission side confirming some significance on the Vehicles, Personnel and Production Costs side.

1.5 Conclusions

The European Union with the adoption of the 2009/490 has introduced the concept of the Sustainable Urban Mobility Plans for metropolitan and city areas defining priorities and encouraging the development by means of monetary incentives with the aim of supporting the planning and implementing actions for sustainable mobility, integrating the other existing plan instruments and following principles of participation, monitoring and evaluation. In this European context the role of municipalities now becomes a necessary condition for obtaining funding for the implementation of urban mobility interventions, in particular in the framework of the POR-FESR 2014–2020 plans. Indeed, it is also

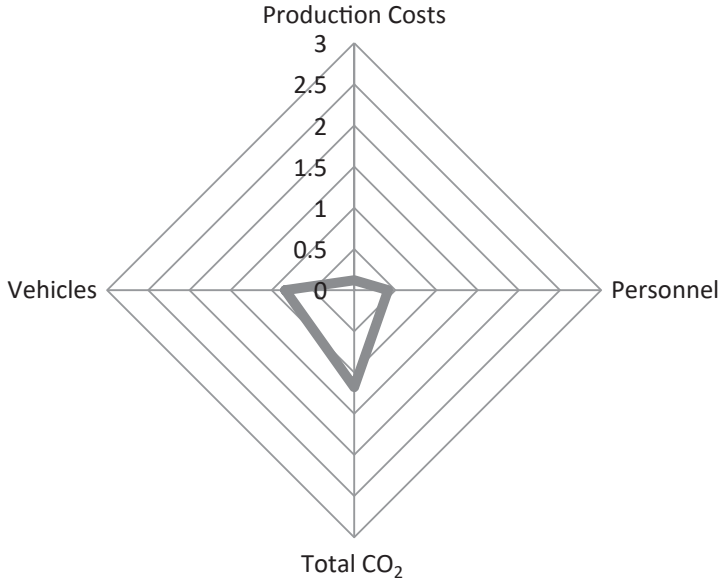

Fig. 1.3 The constant return to scale DEA variable slacks for the year 2010 (*Source* Own elaboration)

a priority to find resources for the renewal of the bus fleet and replace by 2020 the most obsolete vehicles with buses with low environmental impact and reduced energy consumption, also in order to improve or at least maintain the average age of the vehicle fleet.

This study as an application of input-oriented Slacks-Based Model of DEA analysis able to encompass economic, technical, environmental and governance variables, provided a quick overview of the relative efficiency level for Italian bus transportation enterprises sector over the year 2010 considering 131 enterprises and by distinguishing between public and private governance.

The efficiency performance analysis for the Constant Return to Scale SBM model showed that 5/33 (15.15%) of private bus transportation companies were fully technically and scale efficient, while 7/33 (21.21%) were fully managerial efficient (VRS) reaching the score of 100%. The efficiency performance analysis for the Constant Return to Scale SBM model showed that 12/98 (12.24%) of public bus

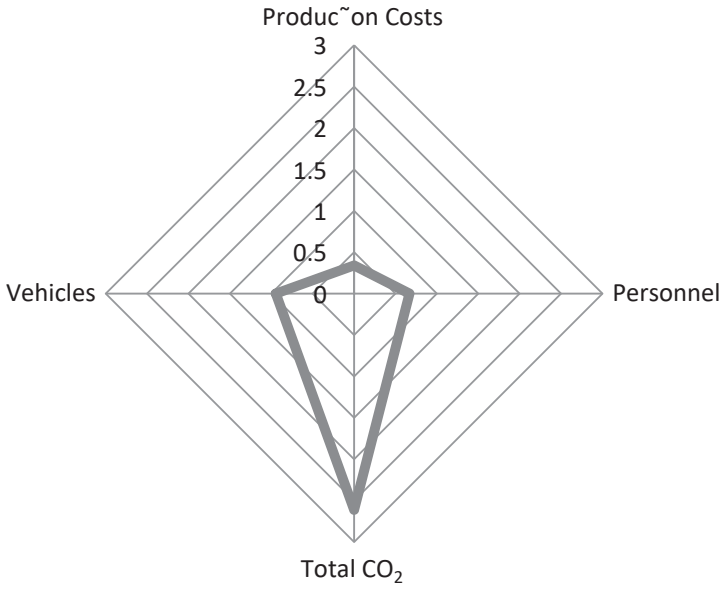

Fig. 1.4 The variable return to scale DEA variable slacks for the year 2010

transportation companies were fully technically and scale efficient, while 20/98 (20.41%) were fully managerial (VRS) efficient reaching the score of 100%.

The efficiency complete framework showed that the CRS Overall Efficiencies is 0.57439, while 0.57255 for the Public companies' and 0.57895 for the Private. The VRS Overall Efficiencies is 0.64209, while 0.6171 for the Public companies' and 0.64320 for the Private. The Overall Scale Efficiencies is 0.64209, while 0.6171 for the Public companies' and 0.64320 for the Private. Consequently, the CRS Overall Inefficiencies is 0.42561, while 0.42745 for the Public companies' and 0.42015 for the Private. The VRS Overall Inefficiencies is 0.35791, while 0.35829 for the Public companies' and 0.35680 for the Private. The Overall Scale Inefficiency is 0.08556, while 0.08582 for the Public companies' and 0.08478 for the Private.

In fact, no significant differences were observed with respect to their being public or private for all the efficiencies dimension: technical, managerial and scale. Indeed, this may be due to the fact that public

enterprises they do not invest due to lack of public governance and lack of money, while the private ones save costs in order to achieve a certain level of profitability for their shareholders.

Further development of the study should consider how, after 10 years at the end of POR-FESR 2014–2020, the situation is changed in terms of economic, environmental and governance variables in order to come up with a kind of comparison. Is to be highlighted that, after the year 2010, many public companies, due to a sort of inefficient public governance, in fact declared bankruptcy or have had access to laws that allow a piloted rescue.

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CHAPTER 2

Decreasing the Environmental Risks Through Inclusion of the Private Companies in the Process of Household Waste Management

Daniela Ivanova and Dessislava Kotcheva

2.1 Introduction

Household waste management is a responsibility of municipalities, who have significant difficulties in reaching the goals set for recycling and recovery of waste. Mixed household waste in Bulgaria contains a large amount of recyclable waste, although a separate collection system is in place. Recyclable materials have some value, and the households still prefer to throw those away, although they pay the cost for waste management through household waste fees (HWF). Waste management policy focuses on decreasing the cost for neutralizing negative environmental impact as well. This requires citizens to follow specific behaviour rules. The big quantities of recyclable waste in the mixed waste shows that

D. Ivanova (✉) · D. Kotcheva
Department of Natural Resource Economics,
University of National and World Economy, Sofia, Bulgaria
e-mail: danielai@unwe.bg

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those are not enough followed. At the same time, there is not much space for increasing the HWF. That is why new instruments are sought for, so that waste management policy efficiency is increased and environmental risks decreased. The study focuses on instruments aimed at the inclusion of the business who is interested in the treatment of waste.

The objective of the study is to gather information on the waste management services market, the private companies' main activities, obstacles to their expansion and attitude to future development and investments. The data gathered are to be analyzed in order to confirm the possibility of attracting the business to the process of household waste management.

The paper is organized into 3 sections. Section 2.2 covers the literature review on which the study is based. Section 2.3 describes the methodology used for data collection and analysis. Section 2.4 is devoted to the findings and discussion from each of the methodological steps—institutional case study analysis, sociological survey among waste management companies and modularity analysis of waste management. The results are summarized and used for drawing a conclusion and making recommendations to municipalities.

2.2 Literature Review

New Institutional Economics (NIE) uses the concept for "efficiency" as it is used by the classical welfare economics as "efficiency in the production of Pareto-optimal combinations and distribution of goods and services" or the so-called distributional efficiency. Under certain conditions, the alternative ways of organizing transactions (governance forms), e.g. hierarchy, decrease the transaction costs and result in distributional efficiency. Under different conditions (governance failure) those lead to higher transaction costs and lower distributional efficiency compared to the market. Following that, the conditions for market and organizational failure have been studied. NIE economists agree that markets are inefficient when public goods are concerned (non-rivalrous and non-excludable), as well as when there are external effects due to which prices do not reflect the full costs due to incomplete property rights (Libecap 2008). Williamson adds that hierarchy replaces the market because transactions generate costs, which lead to the market failing to provide distributional efficiency (Williamson 1971). He adds to the conditions for market failure specific equipment or investments needed for the production transaction of some goods. Under the conditions of no economies of scale in

the production of intermediate goods, the transaction costs are avoided through integration of the production in the firm. Neoclassical and NIE share the view that some market structures in which barrier to entry are observed hinder the efficiency. Williamson adds to those conditions markets with few transactions as well as the condition of uncertainty in demand. Hierarchy according to him is more efficient than market, when there is only one supplier, or when economic agents benefit from centralizing their activity in one governance structure.[1]

So when analyzing the waste management policy and its boundaries, we should take into account the results from a detailed study of the capacity of the market and the firms which the central or local government can use to tackle the problem. Before going to the evaluation and choice of instruments of the environmental policy through calculations of the costs and benefits or efficiency of costs, it is necessary to analyze the market and all market participants, as well as the reasoning behind all current measures for waste management. On the basis of the results of the analysis the boundary line between the market and the policy will be outlined, as well as the possible solutions for decreasing environmental risks and the instruments for doing this can be identified. An adequate method for such an analysis is the case study method used by NIE. It allows for the studying of the causes and consequences for the institutions and institutional change by isolating the impact of theoretical concepts in detail (Alston 2008).

NIE extends the focus of economic research from analysis of the quantities and prices to analysis of the existence and structure of the economic systems, by applying the theories of the firm and the market and studying the structure of individual transactions and their impact on the activity of the firms and the market. As a result of this approach, reasons and consequences for the different governance modes of distribution and coordination of economic resources can be studied (Sykuta 2008). According to Sykuta, these kind of studies focus on the question of what are the factors, influencing the costs for internal coordination and market transactions, leading to the firm deciding to integrate the distribution of resources or to use the market, the so-called "make-or-buy" decision.

[1] Hierarchy has a competitive advantage to single suppliers, when collective decisions are better, when decisions require information which is scattered among a lot of individuals, when it is cheaper to transmit information centrally, and not through the market, or when it is cheaper to make decisions centrally or professionally through professional networks.

It is relating to the two extremes—produce or buy on the market, but between these there are a lot of possible contract solutions, which have the characteristics of both market transactions and managerial control, called "hybrid" (Williamson 1991; Menard 2001). Most of the empirical literature focusing on the firms' forward integration (e.g. production distribution), is based on the stimuli and the risk aversity, while backward integration, known as the make-or-buy in literature, studies the transaction costs (Lafontaine and Slade 2007). In the case of waste management, the integration of waste management activities by the municipality, e.g. after collection of waste, would mean forward integration. The integration of waste management activities by companies, e.g. collection of waste, would mean backward integration for them. So in order to decide which of the possible governance forms is going to decrease the environmental risks in a certain municipality, we need to look at both stimuli and risk aversity, as well as transaction costs.

The distinction between factors of the environment (uncertainty, frequency of transactions and asset specificity) and the behavioural factors (limited rationality and opportunism), allows for the use of analytical methods for the determination of the reasons for choosing the market, hierarchy or hybrid governance forms (Garrouste and Saussier 2008). The alternative to contracts in most cases is market transactions, and in other cases, it is vertical integration or "internal organization" (Masten and Saussier 2000). According to Masten and Saussier the empirical studies show that the bigger the specificity of investments, the more vertical integration is preferred to concluding a contract. On the one hand, with asset specificity, the contract is preferable to the alternative of market transactions, but in order to protect the specific investment, threatened by the relations between the contracting parties, integration of property and production is preferable. On the other hand, uncertainty and complexity of production decrease the advantages of the contract compared to integration as well (Masten 1984). On the basis of these arguments, Masten and Saussier conclude that contracts are an expensive and inflexible way of adaptation to the changes in the environment. They think that a lot of studies consider the asset specificity and the level of investment in these assets as exogenous factors, and those should rather be viewed as decision-making variables. Furthermore, location of equipment, specialized design and scope of investment, should be considered as endogenous factors. In order to eliminate such shortcomings

of the studies, NIE recommends the implementation of the method of case studies, which compensates the lack of generality through providing details about the development of variables with time and with different transactions.

In order to analyse transactions, it is good to know the reason for their existence, so that the right method is chosen. According to Clark and Baldwin "transactions come from the modular structure of the underlying network of tasks and transfers of material, energy and information". "Transfers within modules in the network are numerous and complex, while transfers between modules are relatively few and simple. The between-module transfer points thus constitute a set of 'thin crossing points' in the overall network. These are places where the division of labour and information hiding are high, where transfers are few and simple, and where the mundane costs of converting a transfer (or set of transfers) into a transaction are low. Cost-effective transactions can be located at these points" (Clark and Baldwin 2006).

The scope of the firms should be based on a precise analysis of transactions in the sector and on defining the boundary between monopolistic activity and the potential competitive activities. These transactions are the result of segregating the industry into new operational modules, independent of each other, so that competitive and monopolistic activities are clearly differentiated (Baldwin and Clark 2000). According to Baldwin and Clark, the perfect modularity defines independent groups of tasks, builds clear interface, divides hidden from visible information and in result increases the potential for the management of complex chains of operations. This allows for their parallel and independent operation and makes uncertainty response easier in case it is encapsulated in one module. Unclear boundaries between modules and their interdependence result in external effects, e.g. distortion of competition through the establishment of state monopoly which leads to underdevelopment of the market. The modules of the waste management process should be differentiated on the basis of specifics of activities, e.g. provision of waste collection bins, collection and transport of waste, separation, recycling and recovery. This would allow for the competitive activities to be identified, and all the activities not supplied by the market to be undertaken by the municipalities through the integration of contracting. Before going for reforms aimed at ensuring competition, an institutional analysis needs to be done (Glachant and Perez 2008).

2.3 Methodology and Data Collection

On the basis of the literature review, we assume that environmental risk could be alleviated and waste management goals achieved by municipalities if the waste management system is modularized, and the terms for transactions in the "thin crossing points" between them provided. The modules have to encapsulate all the transfers which do not meet the conditions for performing transactions. Provided certain conditions of the environment and property rights are ensured, transactions could be carried out by exchanging goods and services with companies on the market. In the case of transactions, the municipality and the companies would have to cover the transaction costs for the exchange. If the characteristics of the transactions put limit on the exchange, there have to be ways of changing the organization of transactions (to hybrid or hierarchical) through adaptation of the governance structure, the specificity or uncertainty. This means that the municipalities will have to choose the appropriate governance form for carrying out the transactions or to change the institutional environment by developing and establishing rules of conduct, which everybody has to accept and follow.

Finding the most appropriate solution for decreasing the environmental risk in municipal waste management requires the analysis to go through several methodological steps:

1. Case study analysis of the institutional environment (strategic, legal and regulatory), property rights and market segments on the basis of contracts signed by the municipality and waste permits issued to companies.
2. Sociological analysis of the empirical data on the business motivation and attitudes.
3. Modularity analysis of the transfers and transactions and theory-based identification of an appropriate governance structure.

The case study is focusing on the household waste problems in Ruse municipality and its waste management policy. The choice of a specific municipality is preceded by several factors, including demographics, household waste statistics and external financing opportunities. According to the National Statistical Institute's (NSI) data on collected household waste per capita for 2014, Ruse is the region with the highest volumes of this component—637 kg/person/year (NSI 2014).

In addition, the landfilled waste accounts for 69% of the total waste generated, the recycled—for 26% and the pretreated for 5%. According to this indicator (landfilled waste), the municipality ranks among the regions of the country with the highest values. The institutional analysis covers the strategic and regulatory framework as well as property rights. The aim of the analysis is to assess available and needed financial resources for the waste management activities, covered by the HWF, as well as the possible financial income from waste management activities. The analysis of the segments of the waste management services and the products from those aims at identifying the level of market development and possible barriers to entry. It will show which waste management activities are supplied by the market and which are handled by the public authorities.

The sociological analysis aims at identifying possible market instruments for waste management by the municipality. The survey among companies from the waste sector aims to gather information on the companies' activity, their evaluation of the business environment, the difficulties they meet and their development plans. The subject of the survey is the state of the waste management services market, business activity, obstacles to companies' development and attitude towards future development and investments. The object of the survey are the companies owning permits for dealing with waste. The questionnaire consists of three sections introductory questions, main questions on the problem and final questions related to recommendations and suggestions.

The data is gathered through a direct individual interview with a representative of the managerial staff directly involved with the company's main waste management activity, incl. the manager of the company; production manager, etc.

The total number of the companies owning permits for dealing with waste on the territory of Ruse region is 138 (EAE 2016). For an acceptable level of the statistical error of up to 5%, 102 companies need to be interviewed. The sample of participants in the survey was determined by identifying all 138 companies with permits for waste treatment operations with code R (recycling) on the territory of Ruse region. In most cases, companies can get permissions to carry out multiple activities at once—collection, transportation, temporary storage and processing. After the elimination of the repeating companies, a list of 85 companies with permits for waste treatment activities on the territory of the Ruse region was prepared. The list of 85 companies has been supplemented

with companies operating in nearby regions, still holding waste permits for recycling of waste.

The modularity analysis aims at distinguishing between transactions and transfers. It will study the reasons for the lack of market influence and the necessity of property rights redistribution or integration. It focuses on the choice between stakeholders' actions and its effects. The results from the modularity analysis would allow for the decision on which waste management activities should be provided by the local authorities, and which should be provided by market agents, since market transactions allow for accomplishing the optimal price/quality ratio. The analysis of specific transactions, which are not provided by the market, and are a public function of the municipalities, aims at finding a close-to-the-market solution by redistribution of property rights. If property rights redistribution is not possible, the alternative of changing the organization of transactions through hierarchical or hybrid governance forms will be analyzed. Thus the risk could be decreased either through the implementation of a market or quasi-market structure, or through the adaptation of the governance structure, so that financial and budget restrictions for waste management activities are overwhelmed.

The implementation of this methodology would allow for the identification of the most adequate governance structure for the existing institutional environment. Measures supporting market transactions could be identified, so that competition is not distorted and governance failure avoided.

2.4 Findings Discussion

2.4.1 Institutional Case Study Analysis

The institutional analysis shows that the waste management plan of Ruse municipality is based on the strategic goals on EU level and its responsibilities imputed by the Law for Waste Management. The municipality covers the costs for waste management through the budget income from the HWF due by households. The fee can reach a level up to the maximum social affordability of 1% from the average income of the population. This means the financial resource is limited. The municipality has to choose the basic waste measures needed by its residents and try to limit budget expenses to their minimum.

According to the Law for Waste Management the waste recovery activities have to generate a product subject to market demand. Otherwise the waste quantities, although diverted from landfilling, would not be counted as part of the recycling goals. At the same time, the municipality should use the HWF income for covering costs, which are not covered by the price of the final product from recycling. This means there should be a clear distinction between costs for waste management services which should be paid by the polluters, and costs which are adding value to the final product from the waste treatment and should be paid by the final user or buyer of the product. This distinction should be made on the basis of waste management activities servicing polluters and those which benefit the private companies in the waste sector.

The first step towards defining activities benefiting the citizens and those benefiting the business, is the analysis of the market segments. The aim is to review the waste management services market segments, and be aware of the active and potential market players, as well as the demand and supply of the final products from waste treatment. If there is market demand for these products, the municipality would have the possibility to reach its strategic goals by using market and quasi-market instruments for the distribution of waste as a production resource. Or otherwise the lack of market demand and the reasons behind it would provide information about decreasing environmental risk despite the budget limitations.

The household waste management market segments are based on the activities of collection, transport, separation, reuse, recycling and recovery, incineration and landfilling. The infrastructure for waste management includes regional landfill for non-dangerous waste, sites for handing over non-hazardous inert waste and hazardous waste, automated installation for sorting paper and plastic packaging waste. The landfill is a property of the municipality but is operated by a private operator after a procurement procedure. The site for non-hazardous inert and hazardous waste is on the territory of the landfill. Residents from the Ruse region can hand over large-sized household waste for free, they do not pay and do not get payment.

There is a site for handing over and mobile installation for recovery of construction waste which is property of a private company on a rented municipal land. The waste is hander over for a fee, which is lower than the landfilling fee, so that recycling is stimulated instead of recovery. Ruse municipality can transfer construction waste from the landfill

to companies who have a permit for recycling. So a part of the content of the inert waste cell is already recycled by the private installation. The automated sorting installation operating on Ruse municipality territory is a property of one of the waste packaging recovery organizations in Bulgaria. These organizations are a form of collective responsibility funded by the business. The local district heating company is building an installation for separation of household waste against established gratuitous and permanent right of construction on municipal land. Recycling of green and biodegradable waste is not done due to the lack of an installation. The municipality plans to build a composting and an anaerobic installation through grants from the European Structural and Investment Funds.

All the waste management services organized by the municipality are contracted out to private companies. Additionally, there are 35 sites for taking over waste from plastic, glass, paper and cardboard owned by 27 private companies. They do not report the quantities of waste they take over but it is assumed they recover a big part of the waste generated by households. Their number confirms the market demand for these types of waste.

Although Ruse municipality organizes all the waste management activities required by law, it is difficult to achieve the waste goals set in the strategic documents. There are big quantities of recoverable waste in the content of the mixed household waste containers. This fact confirms the inefficiency of the separate packaging waste collection system as well as the need for implementing a system for separate collection waste with the highest share in total mixed waste—biodegradable, textiles, plastics, inert, paper and cardboard.

The municipality performs on its own just the activities of infrastructure construction, e.g. the landfill, financed by grant funds. All the rest activities are awarded to private companies by public procurement. The only exception is the performance of activities of cleaning of contaminated terrains, watercourses, roads and public spaces, collection of green waste by a municipal enterprise. Although these activities are not directly related to the household waste generated and disposed in the mixed waste containers, they are funded by the budget income as part of the HWF. In conclusion, it may be assumed that there is market interest towards all the segments of the waste management service. The market interest is confirmed by the number of waste recovery sites and of the companies with permits for dealing with waste.

2.4.2 Sociological Survey

The private companies interest of companies in materials from waste needs to be studied, in order to find an adequate solution of the problem with reaching the goals for recycling and recovery of waste and especially with diverting recyclable and recoverable waste from the mixed waste containers. This necessitates a survey of the market environment regarding infrastructure construction and establishment of separate collection systems, including through mobile centres, for biodegradable, inert, textile, plastic, paper and cardboard waste.

After gathering data through interview with the managerial staff of 103 waste companies, conclusions were made on the basis of statistical analysis regarding their willingness to invest in infrastructure in the Ruse region. The problems described by the companies are assessed in order to identify opportunities for motivating the business to provide a part of the funds needed for investments towards increasing the recycling rates.

The conclusions in summary of the business opinion are that the waste management services market is developed only for metal, plastic and cardboard and paper waste. This fact is preconditioned by the demand for these materials. The market for rubber waste is poorly covered by companies. Treatment of construction waste is provided by one company, while there is no market for biodegradable, food and textile waste—a logical consequence from the low rate of demand for these materials. Due to the market demand for certain types of materials, the main services provided by the market are those for recycling. Landfilling is rather a necessity for the company's residual waste after recycling. Composting services are not provided by the market, and incineration is provided by a limited number of companies.

Most of the companies purchasing metal, plastic, paper and cardboard waste are positive about their future development, while all the rest are pessimistic. Logically comes the result from the study of the companies' attitude towards future investments. Most of the companies trading with waste confirm their interest in investing their money in mobile equipment for the collection of waste. Separation and treatment installations are of interest to companies, who do not sell the waste, but treat it themselves. This is most probably related to their expertise in these types of activities, as well as to the financial resource they have access to. Companies who trade only on the local market are probably specialized in collection of trade and rely on quick turnover, so they do not have

the funds needed for long-term investments. Unlike them, the companies who have access to local and international markets are more prone to investments, because they have information about local and international price margins for certain services. Furthermore, the companies selling waste to international markets only, lack willingness to invest in their own installations. This could be explained with their international partners' already owning installations and providing a stable demand for untreated waste. The companies on the local market who have already invested in installations and have information about the rate of demand for the product from treatment of waste are willing to continue investing. All of these observations are valid for the most developed segments of the waste management service for materials such as metals, plastic, paper and cardboard.

The uncertain future income is one of the main factors hindering business development, along with the lack of opportunities for long-term investments and the difficult access to financial resources. In line with these identified difficulties, businesses see opportunities for development, provided that grants or subsidies, clear and long-term rules and long-term waste purchase contracts are available. The willingness of the companies to buy recyclable waste from the municipality or to participate in municipal auctions for separated household waste confirms the interest in waste as a material. The interest of the business in concession of facilities for the separation of municipal waste confirms the importance of security of supply. Companies participating in the survey would not invest in such an installation if they do not have the resource to power it.

2.4.3 Modularity Analysis

The main points of transfer between the activities are identified through analysis of the separate stages of the household waste management process. The transfers by which materials are exchanged for financial resources are classified as transactions. Transactions are differentiated according to the direction of the financial transfer. When the citizens hand over waste for money, i.e. sell the waste to private companies, they make a transaction for materials. On the contrary, when waste is transferred to another stage of the waste management and citizens pay money to the municipality of a private company, they make a transaction for

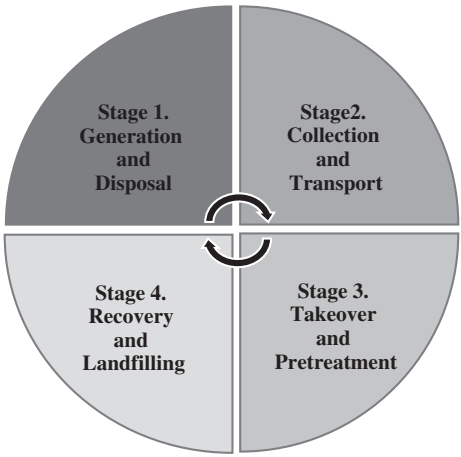


Fig. 2.1 Waste management process stages

waste management services. On the basis of the transfer points, where transactions occur, the separate modules of the waste management service are defined (Fig. 2.1).

Stage 1—Generation, Storage, Handover and Disposal of Waste
At this stage from the process of household waste management, the activities described are related to mixed and separate generation of waste. The main participants in the waste management process are the citizens. They make the decision whether to dispose all the waste in the mixed waste container or to separate it and to dispose the packaging waste in the separate waste collection containers. The main difference between the two choices is the transfer party who gets the materials. It could be either the organization for recovery of packaging waste, who transports the waste to its own separation installation, or the company hired by the municipality who transports waste to the landfill. In this relation transfer 1 and 2 are connected to the activities from Stage 2 of collection and transport (Table 2.1).

A key characteristic of the transfer of materials is the transfer of financial resources. It could largely determine the choice of citizens. In the present case, the difference between the two transfers is that HWF is paid for the transport and landfilling of mixed waste, i.e. the transfer generates costs to the households. In the separate collection, the transfer does not generate costs because the price of the

packaging is included in the price of the product and the producer is responsible for its recovery. By Transfer 3 citizens can hand over large-sized waste free of charge. This transfer is aimed at performing tasks from Stage 4 activities—recovery and landfilling. The cost for citizens come from expenses for transport to the site, as well as for the increased value of HWF, which is distributed to all households. Transfer 4 citizens may choose to sell the recyclable materials (metal, plastic, paper and cardboard, glass and textile) at waste purchasing sites. The transfer is related to fulfilling the activities from Stage 3 and generates income for the citizens. After the municipality builds the composting and anaerobic plant, the citizens will have the opportunity for making Transfer 5, which will bring costs to them again. The choice of disposing the biodegradable waste mixed with all the rest or separately would not make a difference to the costs they cover. The reason is that the expenses for transport of both mixed and separately generated waste is a part of the HWF. The choice between transfers citizens could make regarding widespread waste, e.g. batteries, electric and electronic waste, etc. does not provide financial incentives to them as well. They could either dispose those together with mixed waste or hand those over to companies responsible for their recovery as part of Stage 4. In case citizens hand those over separately, there is no transfer or financial resources, i.e. no transaction. According to data from the morphological analysis of household waste, inert waste is also a relatively big part of the mixed waste content. The citizens are obliged to hand those over to special sites where they pay a fee lower than the landfilling fee. This transfer of materials generates a transfer of funds, at the expense of citizens for their own transport to the site and the fee they pay for handing it over.

All the transfers related to Stage 1 and their characteristics are described in Table 2.1. Each group of tasks is indicated according to the Stage it is a part of, indicated by the first integer, and the activity from the respective stage, indicated by the second integer (e.g. group of tasks 1.1. is a part of Stage 1 activity 1—mixed waste generation, group of tasks 1.2. is a part of Stage 1 activity 2—separate waste generation etc.).

Table 2.1 Transfers of material and financial resources from Stage 1 to other stages

# Transfer	*Type of waste*	*Transfer from group of tasks*	*Transfer to group of tasks*	*Financial transfer*
Transfer 1	Mixed household waste	1.1. Mixed generation and disposal	2.1. Mixed collection and transport	HWF expense to citizens
Transfer 2	Separate packaging waste from metal, plastic, glass and paper	1.2. Separate generation, disposal and hand over	2.3. Separate collection and transport of packaging waste	No, expenses are paid by producers
Transfer 3	Large-sized household waste	1.2. Separate generation, disposal and hand over	4.6. Take over and landfilling	HWF expense Expense for own transport to site
Transfer 4	Waste from metal, plastic, paper and cardboard and glass	1.2. Separate generation, disposal and hand over	3.2. Separate take over and baling	Income to citizens
Transfer 5 (future)	Biodegradable, incl. green waste	1.2. Separate generation, disposal and hand over	2.2. Separate collection and transport of biodegradable waste	HWF expense
Transfer 6	Widespread waste different from packaging	1.2. Separate generation, disposal and hand over	4.4. Widespread waste recycling	No financial transfer, expenses are paid by producers
Transfer 7	Inert waste	1.2. Separate generation, disposal and hand over	4.3. Recycling of construction waste	HWF expense Expense for own transport to site

Stage 2—Collection and Transport of Waste

The Ruse municipality and its contracting private parties for mixed waste collection and transport, as well as separate biodegradable waste in the future are participants in the second stage from the waste management process. The first transfer from this stage (Transfer 8) is related to the handing over of mixed waste to Stage 4 for landfilling (Table 2.2). The next Transfer 9 is between the companies

transporting separately collected biodegradable waste and the composting installation, i.e. to composting tasks from State 4. Here the transaction cost is at the expense of the citizens in the form of HWF as well. Transfer 10 shows the connection between the separate packaging waste collection and transport activities to separate take over and baling activities from Stage 3. The costs are covered by the producers. Transfer 11 will be possible after the construction of separating installation by the local heating company on a municipal land. The municipality is not going to pay for the separation against the right of the private operator to use the recoverable waste for energy production. The residual waste will be transferred further to landfilling in Stage 4 (Table 2.3). There is no transfer of funds from the municipality and its residents respectively at the time of Transfer 11, since the costs are covered by the private partner. Furthermore, the municipality is decreasing its landfilling costs and the costs for deductions paid to the state budget for future waste infrastructure investments.

Table 2.2 Transfers of material and financial resources from Stage 2 to other stages

# Transfer	*Type of waste*	*Transfer from group of tasks*	*Transfer to group of tasks*	*Financial transfer*
Transfer 8	Mixed household waste	2.1. Mixed collection and transport	4.6. Take over and landfilling	HWF expense
Transfer 9 (future)	Biodegradable waste, incl. green waste	2.2. Separate collection and transport of biodegradable waste	4.1. Composting	HWF expense
Transfer 10	Packaging waste	2.3. Separate packaging waste collection and transport	3.2. Separate waste take over and baling	No financial transfer, expenses are paid by producers.
Transfer 11 (future)	Mixed household waste	2.1. Mixed waste collection and transport	3.1. Separation	No financial transfer, expenses are paid by the private partner

Stage 3—Pretreatment of Waste (Separation and Baling)
The takeover and purchasing activities for pretreatment are related to the decisions for transfers of the owners of the sites. At the time of the analysis, the Ruse municipality does not have its own site for purchasing of waste. There is no evidence of the municipality selling waste, except for the planned work with the separation installation built by the heating company. Furthermore, the separated recyclable waste is going to become property of the heating company (Table 2.3), who can sell it to recycling installations (Transfer 12). The rest of the separated waste will be transferred to recovery activities from Stage 4 (Transfer 13). This transfer will not include financial resources exchange since the heating company will use the waste for its own production. According to the contract between the municipality and the heating company, Transfer 14 of residual waste from separation to landfilling from Stage 4 will not include financial transfers as well. The rest of the companies performing take over and baling activities work directly with citizens who have chosen to sell their waste. There are several choices the owners of

Table 2.3 Transfers of material and financial resources from Stage 3 to other stages

# Transfer	*Type of waste*	*Transfer from group of tasks*	*Transfer to group of tasks*	*Financial transfer*
Transfer 12 (future)	Mixed household waste	3.1. Separation	4.2. Recycling for resource recovery	Income from the sales of waste
Transfer 13 (future)	Mixed household waste	3.1. Separation	4.5. Energy recovery	No financial transfer, input in own production
Transfer 14 (future)	Residual fraction after separation	3.1. Separation	4.6. Take over and landfilling	No financial transfer, at the expense of the municipality
Transfer 15	Separate waste	3.2. Separate waste take over and baling	4.2. Recycling for resource recovery	Income from sales of waste
Transfer 16	Separate waste	3.2. Separate waste take over and baling	4.2. Recycling for resource recovery	No financial transfer, input in own production

infrastructure and equipment for pretreatment could make. The first of them is to sell the recyclables to treatment installations (Transfer 15). This transfer would generate income for the companies fulfilling Stage 3 activities. The next opportunity for them is to use the materials for their own production, i.e. to transfer them to their own installations as resource or energy input from Stage 4 (Transfer 16) without transfer of financial resources.

All the identified transfers of material and financial resources are summarized in Table 2.4, where there is a short description of the choice the participants in the transfer make. The aim is all the transfers to be analyzed and evaluated for their capacity to be turned into transactions. This will allow the Ruse municipality to organize these transfers as close to the market as possible. The transfers that do not qualify for a transaction may be included in the relevant modules and possibly organized into a hierarchical management structure.

The analysis shows that the transfers do not include financial resources exchange when waste is transferred back to the producers, such as packaging waste and other widespread waste. Transfer of materials without the exchange of financial resources is different between Stage 3 and 4. Instead of returning the waste to its producer, it is transferred to private companies owning separation installations.

Households can make a transaction and exchange materials for money only between Stage 1 and Stage 3. The private companies on the other hand can transfer materials in two directions: (1) they can take materials over from the households in the same transfer point between Stage 1 and Stage 3; (2) they can transfer materials to other companies in the transfer point between Stage 3 and Stage 4. All the rest of the transfers described in Table 2.4 are made for the provision of a paid service, where materials are not subject of the transfer.

All the transfers of financial resources are characterizing transactions, which for the purposes of the analysis are differentiated as two types—transactions for materials and transactions for services. The difference between these types of transactions is that supply of materials by citizens depends on the price offered, and the supply of services does not depend on the price, but on the rate of demand. While the price of materials from waste is an incentive for the citizens

to hand over waste for recycling, the demand for the services is not determined by the price for its supply. HWF does not have an effect on waste prevention since it is calculated on the basis of residential property area in square meters, i.e. it is not influenced by the quantity of waste generated.

The fact that households dispose of their waste mainly in the mixed waste containers instead of the separate packaging waste containers, means that the obstacles to this behaviour or the lack of incentives for waste prevention influence their decision not to collect separately. Furthermore, despite the opportunity to hand over the recyclables against payment, most of the citizens do not go to waste disposal sites. This is probably due to the lack of economy of scale in paying the transport cost for going to these sites, i.e. the price they would get is an insufficient incentive for them to make the effort. Each citizen gives up the value of the materials in waste by disposing it. In this connection as a result of the giving-up of the value of the material resources by the households, a necessity of waste collection and transportation service arises. However, the materials are not transferred to the service provider but become the property of the municipality as a collective body representing the interest of the citizens.

This is probably the reason behind the planned investment in mobile centres for free disposal of paper, plastic and metal waste in the municipal waste management plan. The implementation of the plan requires additional financial resources gathered through HWF. At the same time this transfer would duplicate Transfer 4, provided by private companies (Table 2.4). The difference between the existing and the planned transfer is that Transfer 4 provides the opportunity for the exchange of materials for a payment, while the planned transfer costs would be paid by the citizens for a service, and the materials will be the subject of a further transfer from the municipality to an installation for waste treatment. In this regard, provided there is already an opportunity for transferring of materials to private companies, it is better for the municipality to attract the business to investing in mobile equipment. In this way, the service transaction would be avoided by transferring the costs to the business who needs the material resources.

Table 2.4 Participants and subject of transfers in the process of waste management

From	*To*	*Transfers without payment*	*Transfers with payment*	*Participants and subject of financial transfer*
Stage 1	Stage 2	T2—disposal in packaging waste separate collection containers	T1 and T5—disposal in mixed and biodegradable waste containers	Private companies contracted by the municipality—households pay HWF for the **service** of collection and transport
Stage 1	Stage 3	N/A	T4—waste from metal, plastic, glass, paper and cardboard	Private companies—households **receive income** for waste they hand over
Stage 1	Stage 4	T6—handing over of widespread waste different from packaging	T3—handing over large-sized household waste T7—handing over inert waste	Regional landfill operator—households pay HWF for the **service** of waste disposal Private company—households pay for the **service** of waste recovery
Stage 2	Stage 3	T10—handing over separate packaging waste for pretreatment T11—handing over mixed waste for separation	N/A	N/A
Stage 2	Stage 4	N/A	T9—handing over separate biodegradable waste for composting T8—handing over mixed waste for landfilling	Composting installation operator—households pay HWF for the **service** of biodegradable waste recovery Regional landfill operator—households pay HWF for the service of recovery and for deductions for future investments and closure of the landfill
Stage 3	Stage 4	T13—transfer of separated waste for energy recovery in own heating installation T14—residual fraction from separation and energy recovery is transferred to the landfill without payment T16—transfer of separate waste to own production	T12—handing over separated waste for recycling T15—selling separated waste for recycling	Private companies, owners of recycling installations—**income** for the owner of the separation installation from selling of recyclables. Private companies, owners of recycling installations—**income** for the owner of site for taking over or baling of waste from selling recyclables.

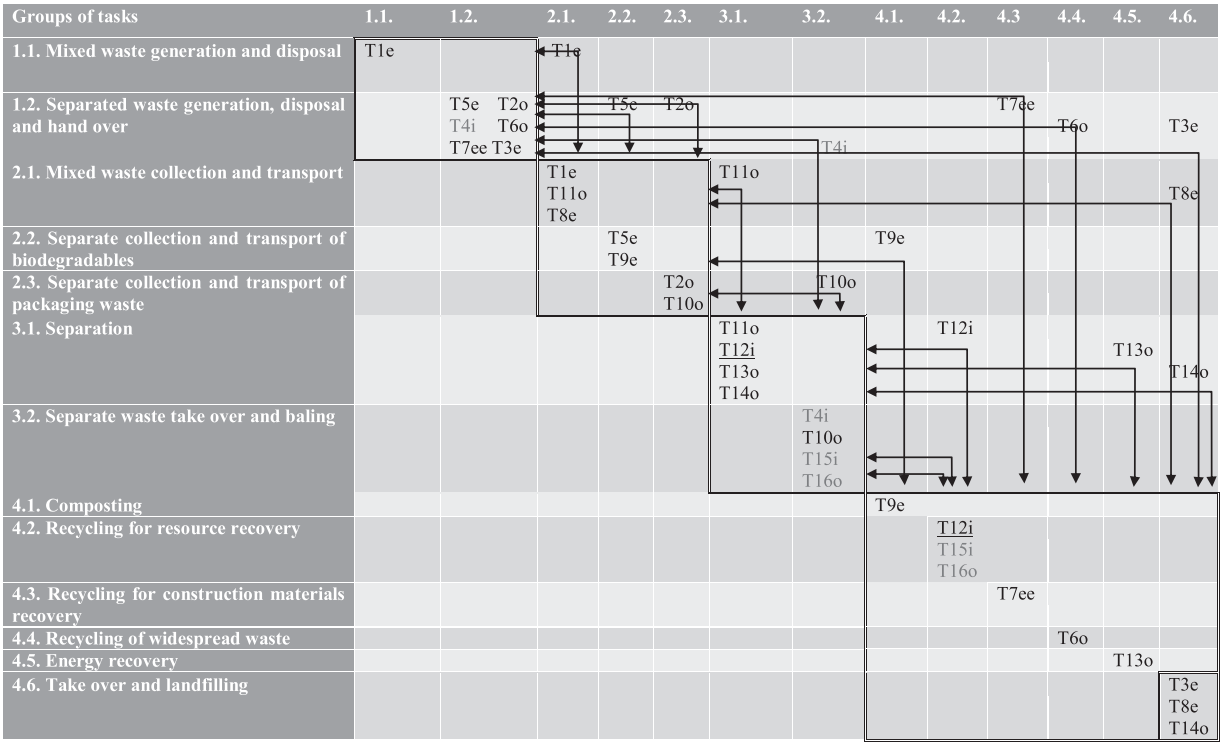
Table 2.5 Transactions delineating the modules of the waste management

Transaction for materials	Transactions for services
	⬅

All the transfers are summarized as transactions for materials and transactions for services in Table 2.5. Transactions are carried out between the various modules, i.e. they outline their boundaries. Transactions for services arise as a result of the lack of market impact in certain segments. The reasons for lack of market impact can be sought both in the way property rights are distributed and in the weak demand for the end product, resulting in uncertainty in its realization. Ideally, for example, there would be no need for service transactions, but the lack of sufficiently developed markets for some materials and the low impact of price signals necessitated the organization of service transactions for the implementation of these task groups. Still the presence of private companies interested in the provision of services and the relatively low number of transactions gives grounds for the assumption that these segments of the entire waste management process are eligible for waste management modules. Service transactions can be converted into material transactions, so that the costs are borne by the business.

All observed transfers are summarized in Table 2.6, so that individual modules and connections between them in the waste management process are distinguished. Each transfer is indicated by a letter T, a sequential number and a letter "o"—for transfers where there is no transfer of financial resources, "i"—for transfers that generate income or "e"—for transfers that generate expenses. The direction of the transfer is ascending, i.e. it is always from a lower-numbered activity to a higher-numbered activity, following the logical sequence of the waste management process. The groups of tasks are placed both vertically and horizontally in the table, so that the points in which there is a transfer between them are marked. Instead of being put at only one point marking the intersection between horizontal and vertical tasks, each transfer is indicated in two places—in the task cell from which it is transmitted and in the task

Table 2.6 Transfers and modules boundaries in the waste management process



cell to which it is transmitted. This is done in order to outline groups of tasks with a line so that squares are visually formed for each activity.

In sum, it can be argued that each of the separate sets of tasks of Stages 2, 3 and 4, outline different modules as described in Table 2.6. The activities of Stage 1 depend entirely on citizens and are related to numerous transfers. That is why it is hard to distinguish the groups of interrelated tasks from this stage into separate modules and the whole Stage 1 represents one module. Thus, for example, the provision of mixed waste collection containers, separate collection containers for biodegradable waste, or containers for separate collection of packaging waste takes place in different ways depending on who performs the collection service. The number of containers depends on the settlement, construction, etc. On the one hand, the provision of equipment, the organization, the execution of some of the tasks or the hiring of a contractor is part of the functions of the municipality and cannot be divided into separate modules with a small number of transactions to any of the other modules. The large number of transactions corresponds to the diversity and conditionality of decisions and behaviour of citizens. In this sense, all tasks related to the activities of Stage 1 are one module. However, any of these tasks may be imputed to one of the contractors in other modules, e.g. providing equipment by the waste collection company.

Each of the activities in stages 2, 3 and 4 is a stand-alone module that a single firm can operate regardless of whether it performs a transaction for the provision of a service or for the utilization of a material resource. It is important to note that within one module there are no transactions of both types at the same time. The explanation for this may be that, for material-related transactions, companies are looking for inputs to their business and thus trigger the market. Where there is no market interest, there is a need for a service that is contracted out, such as the collection and transport service. The level of need for this service may be progressively reduced if the collection and transport of valuable resources are performed by market players involved in material transactions. Such an example could be the cost for the mobile equipment if it is provided by the companies purchasing recyclable waste. They would recover their costs through the sales price of recyclable materials. In this way, the citizens would have an incentive to participate in the separate collection by getting a price for the separately collected waste. Even if the price is lower than the one provided at the waste purchasing sites, they would be able to hand the waste over in front of their homes without going to the

containers or paying the transport costs for going to the sites. The citizens' tasks would become a part of the takeover and baling module.

The study of the transactions shows that they are formed where there is a need for materials or services. The public authority, in our case the municipality, bears the cost for service transactions, while the private business bears the cost for material transactions. In this respect, if materials are collected or produced as a result of the services, it should be possible to convert the transaction for service into a transaction for materials, so that the costs for the transaction are borne by the business.

If waste is not generated separately and is thus not suitable for direct use by the companies, it is transferred to the municipality. As a consequence, the municipality needs to organize the collection, transport and subsequent delivery services for separation, recycling, recovery or as the case may be landfilling. From the point of view of companies which provide waste recycling and recovery services, mixed waste is the subject of a transaction with an unclear volume. Forecasts can be made of what amount of recyclable and recoverable materials there is in its content, but they can by no means be accurate. For this reason, it is difficult for the municipality to pass it on for processing at a specific market price.

In this regard, the municipality should try to ensure the possibility of direct transaction of materials by the citizens to the companies. As mentioned earlier, this can be done by overcoming barriers to separate waste collection. First of all, as it is written in the legislation, the municipality of Ruse will have to adjust the way of formation of HWF, based on the actual amount of waste. This would improve the efficiency of the existing separate collection system for packaging waste as a result of introducing an incentive for citizens to reduce the amount of mixed waste they dispose of. However, it cannot be expected that only this measure will solve the problem of separate collection and complete prevention of mixed municipal waste.

The generation of household waste and its discharge into containers is in direct connection with the collection and transport modules of separately collected waste and the takeover and baling. In order to avoid the need to pay for a collection and transport service, the Ruse municipality could transfer property rights and the responsibility for separate collection of waste to companies engaged in the purchase, trade or processing of recyclable materials. In this way, businesses that have an interest in separate waste will be able to do this at their expense. In order to provide an additional incentive for the citizens to separate waste in their home, the municipality may put a condition to the contracting company

to purchase the waste. The payment could be provided either by cash-back machines, or by kerbside collection with mobile equipment on a confirmed schedule, so that the purchase price of the recyclable materials is paid at the moment of collection.

The results of the modularity analysis show that most household waste management activities can be assigned to market participants. Provided that property rights on waste collection facilities are reallocated to private companies, so that they buy separately collected waste directly from households, the municipality will achieve the minimum possible cost for transport. This condition is complemented by the provision of additional negative incentives for the population by adjusting the way HWF is calculated and informing citizens about that. Such a transaction would be purely market-based without the need for administrative control by the municipality. The transaction takes place directly between citizens and businesses and fulfils the rule for mixed waste prevention. Cost control is carried out by the companies themselves, and citizens decide whether the proposed market price is a sufficient incentive for them to hand over their waste. The question which arises is why companies are not doing this. The analysis of business opinion survey results indicates that the reason lies in the insecure operating income and the impossibility of long-term investment. The incentives identified by them as long-term contracts would be appropriate to increase the interest in such activities. The property rights distribution to certain companies would guarantee the volume of transferred materials, so that economy of scale and return on investments are provided. The additional measures of informing society about its role in the separate collection and its effect on the HWF would provide for a certainty in the level of demand.

Such a transaction corresponds to the definition of a public transaction of the public procurement type (Williamson 1999). According to the contractual choice mechanism of (Menard and Saussier 2000), no big investments are needed, although the assets are characterized by specificity, so the task can be contracted out and due to the lack of uncertainty guaranteed by the distribution of property rights, concession can be used as a form of the contract. This type of governance structure corresponds to the hybrid contract in Williamson's contractual scheme (Williamson 1999). The contract is concluded to prevent or minimize the risks of free market transactions. The concession contract provides exclusive rights for the respective company to perform the tasks of the separate collection directly from the population and transport, thus

eliminating the need for the organization of collection and transport services by the municipality. By the property rights redistribution, the separate collection and transport module is integrated into the separate take over and baling module or any of the recycling modules, and the transaction costs are borne by the private companies. This solution eliminates the risks the business would take in case of uncertainty of the demand by free competition with other companies on the market.

2.5 Conclusion and Limitations/Further Steps

The case study results show that the environmental risks of household waste management could be decreased by redistribution of property rights for the collection of separated waste directly from households. Transfers of rights for full liberalization have been assessed as insufficient for a material transaction to be carried out due to the uncertainty in the demand level. Therefore, an opportunity to integrate the collection and transport tasks into the waste pretreatment module or any of the recycling modules has been identified. The hybrid contract with a condition for the purchasing of waste collected as an incentive to households is evaluated as the adequate governance structure.

The study is limited to assessing the use of governance structures of transactions of household waste management in a Bulgarian municipality. Given the limitations of this study, efforts can be made in the future to solve waste management problems in other municipalities as well. At the same time, the developed methodology can be applied to other types of waste.

The study can be complemented by further analyses to verify the relationship between the stage of the waste material market development and the provision of public services as part of the waste management policy. It would be interesting to trace the effect of public policy measures on the market and vice versa—the effect of the market development on waste management policy.

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CHAPTER 3

Customs and IoT for Monitoring Risk-Management Systems: Some Recent Applications

Erica Varese and Stefano Maria Ronco

3.1 Introduction

With the rapid growth in trade volume, illegal activities still exist in import and export channels; the essence of a modern customs system is based on a mutually beneficial cooperative customs-to-business partnership (Meng 2017).

After the terrorist attacks of 11 September 2001, the USA and many other countries and regions, such as the EU, desired to implement

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E. Varese (✉)
Department of Management, University of Torino, Turin, Italy
e-mail: erica.varese@unito.it

S. M. Ronco
Department of Legal Studies, University of Torino, Turin, Italy
e-mail: stefanoronco@icloud.com

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cooperation in order to increase the safety and security of international logistics while leaving the flow of goods unobstructed.[1]

Security in supply chains and better trade facilitation (hereafter, TF) have therefore become a top priority. This topic has received increasing attention not only from researchers but obviously also from all supply chain actors.

The matter has immediately attracted the attention of relevant international bodies as well: in June 2002, the World Customs Organization (hereafter, WCO) formed a Joint Customs-Industry Task Force on Security and Facilitation. Subsequently, in June 2005, the WCO Council adopted the SAFE Framework of Standards to Secure and Facilitate Global Trade (hereafter, SAFE Framework). The main objective of the SAFE Framework is to secure and facilitate global trade through the establishment of cooperative arrangements among customs, trade and other government agencies in order to promote a uniform movement of goods through secure international trade supply chains (Wolffgang and Natzel 2007; World Customs Organization 2018).

According to Tweddle (2008), key elements of the SAFE Framework are "*the mutual recognition of controls and information which will allow a broader and more comprehensive view of the global supply chain and create the opportunity to eliminate duplication and multiple reporting requirements*".

Similar steps have been undertaken in the European Union framework, as highlighted in the Strategic Plan 2016–2020 proposed by the European Commission's Directorate-General for Taxation and Customs Union (TAXUD).

In particular, this EU document underlines the need of balancing protection of revenue sources with support to the competitiveness of EU

[1] In international trade, according to Grotteli (2015) safety is most often defined "*as a condition in which the vast majority of risks associated with the conducted activity, have been identified, the probability of specific adverse events has been defined, accepted and special measures have been taken to limit the risks*" while security and trade facilitation "*should be defined as the conditions enabling business activity in a free and adjustable way, with the autonomy of the will of the operators engaged in that activity and the necessity to maintain existing volumes of risk by maintaining limited confidence in the economic and legal relations between the contracting parties, and also between internal and international environment. In the context of transnational threats such as terrorism and smuggling, security is also defined as the physical protection of technical infrastructure of the company, as well as cargo security and security of any information associated with it*". The objects of security are therefore (Manuj and Mentzer 2008; Sarathy 2006) for example harbours, warehouses, terminals, transport means and also staff operating in all this infrastructure.

businesses on the world markets. It also highlights the importance of a comprehensive trade facilitation reform that could "*cut trade costs by up to 10% for OECD countries*".

Against this background, the European Commission stresses that "*increasing the efficiency of customs is pivotal*" and that "*Modernising customs and strengthening international customs cooperation are the main drivers*". The European Commission also underlines that such a goal should be achieved by improving risk analysis at customs level, specifically selecting for controls those consignments which present a higher risk of non-compliance.

Further, significant relevance should be given to quality management systems adopted by the international standard setting ISO 9001:2015, the implementation of which by import–export companies is considered (Afanasieva et al. 2017) helpful in facilitating customs activities.[2]

Given the above, the aim of this paper is to present some thoughts on two different risk-management tools—the Authorized Economic Operator (hereafter, AEO) at EU level and the "*Fiche Electronique de Renseignement à l'Importation* - Feri certificate" (hereafter, FC) used in some African countries—developed in the context of the customs system, which both adopt some features typical of an IoT-based technology.

This research fills a gap in literature: to the Authors' knowledge, this is the first paper comparing the two mentioned programmes, and one of the very first studies on the FC.

This paper is divided into 7 sections: Sect. 3.2 presents a brief theoretical framework on risk-management systems in customs administration; Sect. 3.3 explores the relationship between risk-management capabilities and IoT considering the opportunities presented by IoT-based technologies for customs authorities and trade facilitation institutions; Sect. 3.4 introduces the cases of the AEO status and the FC; Sect. 3.5 offers a literature review on AEO status and FC mechanism and on the role of pre-shipment loading notes in the practice of some African countries; Sect. 3.6 discloses methodology and data collection, and in Sects. 3.7 and 3.8 the findings/discussion and the final conclusions, implications and limitations of the work are summarized.

[2]These Authors highlight that "*Currently one of the most widespread and effective systems of management is the quality management system, the basic requirements of which are set out in the international standard ISO 9001:2015. Introduction in activity of customs requirements and quality management principles in accordance with this standard, is a strategic decision that will enable to increase the efficiency, effectiveness, reliability and quality of customs services*".

3.2 Risk-Management Systems in Customs Administration: General Considerations

As briefly pointed out above, developing a closer customs-to-business partnership and improving trade facilitation mechanisms while effectively guaranteeing safety and security in the flow of goods at international level is a key issue for fostering economic growth by significantly reducing trade costs.

In this regard, it is well-known that one of the components for achieving such a result derives from the limitation of intrusive customs examination, which is an action advocated under the Kyoto Convention and discussed within the WTO framework.[3]

According to Laporte (2011), modern customs activities should "*now intervene at all stages of the customs chain, using electronic data exchange and risk analysis, and focusing their resources on a posteriori inspection*".

However, as is widely known, this is a challenging task, especially for customs authorities located in developing countries, which are in a more difficult position as to implementing risk analysis and management techniques.

Although risk analysis should be considered a key element for modernizing customs administration in these countries, it should be noted that any effort on this side would be impaired unless it were matched by significant reforms in human resource management and governance at administrative level (Laporte 2011).

In addition, it happens rather frequently that developing countries prefer to outsource risk-management systems to private parties, with the aim of complementing ineffective customs checks with pre-shipment inspection programmes or other auditing services.

The effectiveness of the overall system appears questionable, doubts having been expressed as to the real integration and level of exchange of information between private companies entrusted with risk-management

[3] In this regard, see *Harmonisation of the customs risk management system with the EU standards and best practices* by the Republic of Croatia Ministry of Finance—Customs Administration, which underlines that "*customs controls should ensure that the movement of vessels, vehicles, aircraft, goods and persons across international borders occurs within the framework of laws, regulations and procedures that comprise the customs clearance process. Given the high number of export, import and transit transactions many customs administrations use risk analysis to determine which persons, goods and means of transport should be examined and to what extent* (WCO Revised Kyoto Convention, Standard 6.4.)".

checks on behalf of the developing country and their customs authorities (Johnson 2001).

However, it should be pointed out—as will be further discussed below—that there is a conceptual difference between customs authorities and trade facilitation mechanisms entrusted to private parties: only customs authorities are public entities, carrying out functions of public nature, such as the collection of taxes and duties at borders. Tasks entrusted to private entities, on the other hand, even if carried out with the aim of fostering import–export of goods, remain dependent upon their contractually defined scope of intervention which is limited to trade facilitation mechanisms and does not fall within the realm of entitlements of public entities.

Given the considerations above, it is unquestionable that risk-management techniques are acquiring growing importance in the customs scenario. However, as doctrinal studies have pointed out, careful attention should be paid to the existing "divide" between capabilities and institutional tools put into place in developed countries *vis-à-vis* structural deficiencies in developing countries' customs management.

As put forward by some Authors, these limitations on the part of developing countries are usually overcome by resorting to services provided by private entities, which are able to facilitate import–export formalities, even if lack of proper exchange of information and gaps in structuring a strong relationship seem to impair the overall efficiency of the system in developing countries.

3.3 Risk-Management Capabilities and IoT: Which Opportunities for Customs Authorities and Trade Facilitation Institutions?

It is against this background, briefly described above, that IoT developments in improving risk-management capabilities should be understood, taking into consideration existing diverging practices among customs authorities located in developed countries vis-à-vis those pertaining to developed countries.[4]

[4]It is difficult to find a generally agreed definition of IoT. In very broad terms, this notion means "a networked connection of physical objects that are not computers in the classic sense" (Okazaki 2017). This Author further describes IoT as "*a variety of items, including household products and community facilities which have been equipped with*

This being said, the relevance of IoT and, more generally, data-driven technology is well-known and its growing acceptance by industries and business sectors is undisputable.

In this scenario, the logistics industry has quickly adopted such technological innovation, seeing in advance its benefits for strengthening networks and improving information sharing at logistics level. As put forward by Lacey et al. (2015), "*companies in this sector have embraced the suite of data-driven technologies dubbed the Internet of Things (IoT) in diverse settings, from maritime and aviation freight to warehousing to package delivery*".

Given the above, the importance of IoT deserves to be discussed in the light of the implications it could have in terms of risk management as a tool for ensuring that customs authorities are able to receive better information and make smarter decisions.

In any case, the most interesting feature of IoT application to customs management has to do with the fact that this technology enables to turn any object into a source of information about that object; such a feature is extremely important in an industry which is fundamentally about moving things from one place to another.

In this regard, as noted in scholarly researches (Lacey et al. 2015), most IoT technologies already implemented by transport and logistics companies concern track-and-trace applications, such as GPS asset tagging, which are aimed at optimizing routes by detecting real-time locations of shipments and cargoes and identifying the shortest and most fuel-efficient route to destination. Again, the immediate goal of this application is to "*allow for faster movement through the network with fewer transitions*".

However, adoption of IoT technologies provides further benefits, which are not merely limited to improvements in fuel-efficiency or in time-saving applications for the transport and logistics industry.

In this regard, widespread introduction of IoT technologies and better use of the information acquired in the process might create significant value and new resources for companies in the transport and logistics industry. However, as has been pointed out, the latter development is

information terminals and thus become a provider of raw or initial data, focused on their regular use, helping to facilitate certain business tasks, public or private".

still under way as it poses challenges and hurdles on companies, demanding significant changes to existing business practices.[5] It appears, on the other side, that such a change in business practices is unavoidable and companies in the transport and logistics sector are more and more realizing that "*the value generation based on collected information is becoming a T&L industry standard for their customers: the market is beginning to demand a strategic positioning related to the IoT*".[6]

As has been described, the relevance of IoT technologies in the transport and logistics field is well-known and is acquiring growing importance. On the other side, IoT application by customs authorities or in a customs-related setting appears to be less common.

In this regard, the most important IoT applications developed by customs authorities relate to big-data technologies, aimed at improving analytics and risk-management applications.

In other words, as pointed out in scholarly researches (Okazaki 2017), when IoT initiatives are undertaken by customs authorities, this translates into the acquisition of a better analytical power and improved quality of the data received regarding shipments, cargoes and so on.

It should also be noted that the adoption of IoT applications by customs authorities is already underway, particularly in some developed countries (as discussed above, structural deficiencies in developing countries' customs management play a role in this dynamic as well).

Empirical researches on this matter have highlighted that big-data technologies are already implemented in the customs systems of the U.S. Customs and Border Protection; the New Zealand Customs; the Hong Kong China Customs; the United Kingdom Revenue and Customs.[7]

[5] The reasons are clearly described in Lacey et al. (2015). The Authors note that: "*currently, the highest concentration of use cases can be found within the sensing and shaping category, such as applications offering track-and-trace. Such applications are simplified by the fact that they must exist on the supply side of logistics, which can be owned entirely by the T&L company. Therefore, such applications can be accomplished with relatively few hurdles or changes to existing business practices. By contrast, few companies—in any industry, not only T&L—have thus far adopted IoT applications that achieve ecosystem scope. In T&L, the difficulty encountered in moving to these higher-value, larger-scope applications can be captured by the fact that they must incorporate both demand- and supply-side logistics capabilities*".

[6] Cfr. Lacey et al. (2015).

[7] Okazaki (2017). This Author remarks that this is not an easy task as "*in order for Customs administrations to implement a big data strategy, knowledgeable experts, whether in-house or outsourced, are necessary. Furthermore, a strategy on how to engage specialists in the relevant fields, including cyber security and incident readiness, should be elaborated*".

The practices and regulatory techniques adopted in the above-mentioned cases are however remarkably diverse and it seems difficult to see, at this stage of development, common patterns in the way IoT and big-data technologies are introduced at customs level in each of these countries.

In addition, as noted in literature, customs seem to have "*not yet been fully prepared to use such data to extract the information which could result in improved decision-making*".[8]

This outcome is the result of a two-folded issue. On the one hand, existing data exchanged at customs level are disordered and untidy; therefore, they are difficult to structure and then properly be used by customs authorities during customs and clearing procedures.[9]

On the other hand, big data usage requires developing a skilled workforce, capable of mastering data analysis techniques and professionally trained to use datasets for customs purposes.[10]

It follows from the above considerations that IoT-based technologies are surely gaining a growing importance in the transport and logistics field. However, these techniques seem to be less developed in the context of customs activities. It appears that their relevance in improving risk-management capabilities is still limited and at an early stage.

[8] Okazaki (2017).

[9] As noted in Okazaki (2017), "*big data contains clusters of raw data that are disordered and untidy. More technically, it relies on a broad mix of both structured and unstructured data formats. This represents a stark change for Customs administrations usually accustomed to structured data; that is, data from electronic declarations for example are well defined by the WCO Data Model, and the EDIFACT family of standards. The 'standards' defining big data would be much more varied, and largely outside of government's control. It is clear that any intentions to exploit the potential of big data will require Customs, on the one hand, to have a strong mastery of its own structured data management and, on the other hand, to advance into other areas to exploit new data as well. The standards are still being written for the areas of commerce and industry; therefore, Customs administrations seeking data from the business community will be encouraged to focus their attention on new emerging standards, with a view to benefiting from the 'sense-making' potential of big data*".

[10] As noted in Okazaki (2017), "*unlocking potential for big data usage will require strategically developing their workforce by identifying high potential data analysts that can be hired early in their career and grow professionally inside the organization*".

3.4 Risk-Management Framework and Applications: A Brief Introduction to the Cases of the Authorized Economic Operator Status and of the FC

Both the SAFE Framework and the "security amendment" to the European Community Customs Code feel the need to introduce a "*wide risk management framework to support a common approach so that priorities are set effectively and resources are allocated efficiently with the aim of maintaining a proper balance between customs controls and the facilitation of legitimate trade*" (Regulation EC, No. 648/2005). This status is called AEO and came into effect in the EU from 1 January 2008. The programme implies that the relationship between customs and AEO should always be based on the principles of mutual transparency, correctness, fairness and responsibility.

There are other AEO initiatives in the world such as, the Custom-Trade Partnership Against Terrorism (C-TPAT) in the USA, Partners in Protection (PIP) in Canada, Golden List Program in Jordan and Secure Exports Scheme (SES) in New Zealand (Weerth 2015). The main objective of these supply chain security programmes is to identify security risks before goods move (den Butter et al. 2012).

In the EU, criminal activities such as counterfeiting, piracy and theft have been committed against almost each product sector. Thanks to customs controls, in 2016 more than 41 million (41,387,132) counterfeit articles have been discovered, with an estimate retail value of original goods of 672,899,102 euros. The top categories of detained articles were cigarettes, which accounted for 24% of the overall amount of detained goods, followed by toys (17%), foodstuffs (13%), packaging material (12%) and other goods (8%) (European Commission—Taxation and Customs Union 2017).

The AEO is an EU supply chain security authorization that has the scope of enhancing international supply chain security and facilitating legitimate trade. Security and safety are a priority in the EU territory, as any "*security/safety gaps are likely to be exploited by wrongdoers, thereby putting in question the integrity of the single market as well as security in the EU*" (Aigner 2017).

Many companies consider AEO authorization as a passport for doing business globally (Miled and Fiore 2014).

Outside the EU, goods shipped to some African countries such as the Democratic Republic of Congo require the FC. It provides an example of application of an IoT-based system adopted in customs-related activities with the aim of tracking the flow of imported goods in the country and simplifying relevant customs formalities. It may be included in the framework of the TF.

3.5 Literature Review

3.5.1 Literature Review: AEO Mechanism

TF can be explained as the application of "*methods for the reduction of barriers that can hinder trade in global operations*" (Campos et al. 2018) without compromising the security of trade or the ability of governmental agencies (mostly customs) to charge taxes and collect revenue (Moïsé 2013).

TF are a set of measures aiming to simplify, harmonize, standardize international trade procedures. They relate to customs procedures, logistics, licensing procedures and documentation, insurance and other financial requirements imposed on the entry or exit of goods from countries (Behar et al. 2011; C.de Sá Porto and Morini 2017).

TF encompasses a link between a public and a private party and is therefore considered as a type of Public–Private Partnership (hereafter, PPP).

In international trade, PPPs are partnerships between customs and businesses that have taken the form of structured programmes (Campos et al. 2018). The AEO is the one that has become the most important and widespread in international trade worldwide.

In the EU, the so called "Union Customs Code legal package" has modified the pre-existing framework that regulates the procedure for issuing the AEO *status* and the related benefits (European Commission—Taxation and Customs Union 2018b).

The "Union Customs Code legal package" that directly relates to the AEO *status* is composed of the following legal acts (Agenzia Dogane e Monopoli 2018):

i. The Union Customs Code (hereafter, UCC): Regulation (EU) No 952/2013 entered into force on 30 October 2013, although most of its substantive provisions apply since 1 May 2016;

ii. The UCC Delegated Act adopted on 28 July 2015 as Commission Delegated Regulation No. 2015/2446. It supplements certain non-essential elements of the UCC;
iii. The UCC Implementing Act adopted on 24 November 2015 as Commission Implementing Regulation No. 2015/2447. It aims to ensure the existence of uniform conditions for the implementation of the UCC and a harmonized application of procedures by all Member States;
iv. The UCC Transitional Delegated Act adopted on 17 December 2015 as Commission Delegated Regulation No. 2016/341. It establishes transitional rules for operators and customs authorities pending the upgrading or development of the relevant IT systems to create a fully electronic customs environment.

As mentioned above, the EU established its AEO concept based on the internationally recognized standards, creating a legal basis for it in 2008 through the "security amendments" to the Community Customs Code (CCC) and its implementing provisions. The programme is open to all supply chain actors, including small- and medium-sized enterprises.

There is no legal obligation for economic operators to become an AEO, nor is there any legal obligation for AEOs to require their business partners to obtain the AEO *status*.

According to article 38 (1) UCC, an economic operator may apply for the *status* of AEO only if he is established in the customs territory of the EU and meets the criteria specified in article 39 UCC.

An economic operator is "*a person who, in the course of his or her business, is involved in activities covered by the customs legislation*"—article 5 (5) UCC—and therefore is entitled to benefits within the entire customs territory of the EU.

The *status* of the AEO consists of different types of authorizations: AEO for Customs Simplification (hereafter, AEOC), AEO for Security and Safety (hereafter, AEOS) or a combination of the two, Customs Simplification + Security and Safety, AEO Full (hereafter, AEOF).

The AEO *status* can be granted to any economic operator meeting the common criteria (article 39 UCC) listed in Table 3.1 and, if obtained, this authorization is recognized by the customs authorities in all Member States—article 38 (4) UCC.

Table 3.1 AEOC, AEOS and AEOF: conditions and criteria

Conditions and criteria	*AEOC*	*AEOS*	*AEOF*
Economic Operator	X	X	X
Established in the Customs Territory of the Union	X	X	X
Compliance with customs legislation and taxation rules, including no record of serious criminal offences relating to the economic activity of the applicant	X	X	X
Demonstration of a high level of control of its operations and of the flow of goods, by means of a system of managing commercial and, where appropriate, transport records, which allows appropriate customs controls	X	X	X
Proven financial solvency	X	X	X
Practical Standards of Competence and Professional Qualification directly related to the activity carried out	X		X
Appropriate Security and Safety standards		X	X

Source European Commission—Taxation and Customs Union (2016a, b)

The economic operator may hold at the same time a combined AEOC and AEOS authorization if he/she fulfils all the above-mentioned criteria.

Each type of authorization offers different kinds of benefits (article 38, UCC) (direct and indirect) which are recognized in all Member States (Table 3.2).

Indirect benefits may be summarized as follows (European Commission—Taxation and Customs Union 2016a, b): "*analysis in detail of all the related international supply chain processes; visibility and tracking; personnel security; standards development; supplier selection and investment, transportation and conveyance security, building organisational infrastructure awareness and capabilities, collaboration among supply chain parties, proactive technology investments and voluntary security compliance. Some examples of the indirect benefits that may result from these positive effects could be the following:*

- *reduced thefts and losses;*
- *fewer delayed shipments;*
- *improved planning;*
- *improved customer service;*
- *improved customer loyalty;*
- *improved inventory management;*

Table 3.2 AEOC, AEOS and AEOF: benefits

Benefits	*AEOC*	*AEOS*	*AEOF*
Easier admittance to customs simplifications	X		X
Fewer physical and document-based controls: –related to security and safety –related to other customs legislation	X	X	X
Prior notification in case of selection for physical control (related to safety and security)		X	X
Prior notification in case of selection for customs control: –related to security and safety –related to other customs legislation	X	X	X
Priority treatment if selected for control	X	X	X
Possibility to request a specific place for customs controls	X	X	X
Indirect benefits	X	X	X

Source European Commission—Taxation and Customs Union (2016a, b)

- *improved employee commitment;*
- *reduced security and safety incidents;*
- *lower inspection costs of suppliers and increased co-operation;*
- *reduced crime and vandalism;*
- *improved security and communication between supply chain partners*".

Mutual Recognition of AEOs is a key element of the WCO SAFE Framework. By mutual recognition of AEOs two customs administrations agree to: (i) recognize the AEO authorization issued under the other programme and (ii) provide reciprocal benefits to AEOs of the other programme.

Until now the EU has concluded and implemented Mutual Recognition of AEO programmes with Norway, Switzerland, Japan, Andorra, the USA and China.

Economic operators may apply for AEO *status* through an application process that determines their eligibility.

AEOs are entitled to utilize the AEO logo (Fig. 3.1) that can be used under the following conditions: (i) the right to use the logo is on condition of having a valid AEO authorization; (ii) only the holder of a valid AEO authorization can use the logo; (iii) AEOs must stop using it as soon as their AEO *status* is suspended or revoked.

Fig. 3.1 AEO logo (*Source* European Commission—Taxation and Customs Union [2018a])

Table 3.3 illustrates the number of AEO holders in the 28 EU Member States on 27 August 2015 and 2018.

Concerning the type of AEO authorization, at the end of August 2018 there were 7118 companies with AEOC *status*, 647 with AEOS *status* and 15,917 with AEOF *status*.

A comparison of these data with the ones presented by Laszuk and Ryciuk (2016) shows, over a period of exactly 3 years (27 August 2015–27 August 2018) an increase in the total number of AEO holders by 19.3% (AEOC: +22.3%; AEOS: +25.1%; AEOF: +16.3%).

As shown in Table 3.4, the ranking of the first five Member States with the highest number of AEO holders is quite the same in 2011 and 2018.

3.5.2 The FC Mechanism and the Role of Pre-shipment Loading Notes in the Practice of Some African Countries

As briefly introduced above, goods shipped to some African countries, such as the Democratic Republic of Congo, require the FC or a similarly denominated electronic document.

Table 3.3 Numbers of AEO holders in EU28 (as for the day 27 August 2015[a] and 27 August 2018[b])

Country	*AEOC*		*AEOS*		*AEOF*		*Total*	
	2015	*2018*	*2015*	*2018*	*2015*	*2018*	*2015*	*2018*
Austria	82	126	2	4	173	208	**257**	**338**
Belgium	29	53	28	32	315	387	**372**	**472**
Bulgaria	1	9	0	0	19	46	**20**	**55**
Croatia	17	24	0	0	1	7	**18**	**31**
Cyprus	3	5	0	0	14	16	**17**	**21**
Czech Republic	49	137	6	12	99	102	**154**	**251**
Denmark	4	21	1	0	85	95	**90**	**116**
Estonia	6	8	4	3	15	23	**25**	**34**
Finland	7	10	10	8	63	72	**80**	**90**
France	319	441	179	228	730	948	**1228**	**1617**
Germany	3281	3564	41	58	2336	2622	**5658**	**6244**
Greece	47	81	2	2	43	55	**92**	**138**
Hungary	177	236	21	17	111	130	**309**	**383**
Ireland	15	18	1	1	104	124	**120**	**143**
Italy	385	580	18	33	532	713	**935**	**1326**
Latvia	3	12	1	1	17	18	**21**	**31**
Lithuania	8	25	1	1	21	39	**30**	**65**
Luxembourg	7	9	3	3	20	24	**30**	**36**
Malta	1	4	1	1	10	10	**12**	**15**
Netherlands	359	411	94	123	1000	1031	**1453**	**1565**
Poland	478	519	29	34	244	263	**751**	**816**
Portugal	67	72	7	8	24	29	**98**	**109**
Romania	6	21	4	6	66	104	**76**	**131**
Slovakia	28	57	7	5	33	40	**68**	**102**
Slovenia	31	44	8	9	51	58	**90**	**111**
Spain	208	237	34	36	409	467	**651**	**740**
Sweden	136	129	5	4	174	155	**315**	**288**
United Kingdom	64	265	10	18	300	366	**374**	**649**
Total	**5818**	**7118**	**517**	**647**	**7009**	**8152**	**13,344**	**15,917**

Source [a]Laszuk and Ryciuk (2016). [b]European Commission—Taxation and Customs Union (2018c)

This is an example of application of an IoT-based system adopted in customs-related activities with the aim of tracking the flow of imported goods in the country and simplifying relevant customs formalities.

As a first introduction, it should be highlighted that the loading note or waiver is a document obtained to load cargo which is necessary in several African countries to effectively control, supervise and manage import and export traffic. In this regard, the FC is one kind of loading note,

Table 3.4 Ranking of the first five Member States with the highest number of AEO holders on 2 January 2011[a] and 27 August 2018[b]

EU Member State	*Number of AEO (2 January 2011)*	*Ranking (2 January 2011)*	*Number of AEO (27 August 2018)*	*Ranking (27 August 2018)*
Germany	1413	1	6244	1
France	361	3	1617	2
Netherlands	430	2	1565	3
Italy	332	4	1326	4
Poland	289	5	816	5

Source [a]Weerth (2011). [b]European Commission—Taxation and Customs Union (2018c)

adopted for the shipment of goods into the Democratic Republic of Congo.

The use of loading notes to load cargoes shipped to African countries is a well-known practice adopted not only in the Democratic Republic of Congo but also, inter alia, in Angola, Gabon, Niger, Ivory Coast and Mali. The management of these certificates is left in the hands of private companies, which have the task of running it on the basis of contractually defined agreements with other private entities entrusted with the task of managing pre-clearance activities at border. None of these entities is entrusted with customs activities on the part of the country's customs administrative authorities and the overall system is private in nature, without any direct intervention of the country of importation of the goods.

Besides its legal design, the most interesting feature of the FC, as well as the other loading note systems adopted in these African countries, is that it embodies a technology platform allowing the regularization of goods from all ports of embarkation and tracking of the same.

In addition, considering the particular maritime geography of some African countries adopting pre-shipment loading certificates, some certificates embody additional technology tools allowing to track cargo from port of discharge to entrance point, facilitating customs controls at various border crossings in the country of destination.[11]

[11] Further features of these pre-shipment loading certificates allow to develop and manage a network of satellites which guarantee the connection of various systems, overcoming lack of accessibility in many remote areas in Africa.

It is however difficult to discuss in further detail the characteristics of these pre-shipment loading certificates, considering that, as explained above, there is a literature gap on their application in the practice of African countries.

This being said, it appears that, similarly to the AEO status, also the FC—as well as similar certificates adopted in other above-mentioned countries—should be considered a trade facilitating tool.

As briefly underlined, it both enhances international supply chain security, by allowing the tracking of cargoes at the borders of the country of destination, and provides a facilitation for legitimate trade, incorporating in an electronic certificate multiple information on the imported goods, which is useful for importers and eventually helpful in customs clearance activities.

As a matter of fact, there are also two important features deserving to be taken into consideration in a deeper fashion.

On the one hand, it is unquestionable that the mechanism at stake falls within the category of those risk-management systems adopted in many developing countries, the operation of which is entrusted to private companies with the aim of providing better and more reliable information than is potentially receivable from public customs administrations.

On the other hand, it is interesting to note how the design of these certificates incorporates many of the typical features of IoT-based applications.

While these certificates are not used by public entities and no exchange of information exists between the private companies running the system and the customs authorities, it clearly appears that these tools are an example of IoT applications implemented in the transport and logistics industry, mainly for track-and-trace purposes of cargoes and shipment in remote areas lacking accessibility.

3.6 Methodology and Data Collection

Even if the two above-mentioned programmes have dissimilar origins and legal technical aspects making them significantly different, we aim at demonstrating that both are intended to simplify customs procedures and facilitate customs controls related to safety and security in all stages of supply chains of goods by adopting a risk-management strategy.

Our study can be divided into two steps, one following the other.

To analyse the object, the scope, the characteristics and the pros and cons of the AEO authorization, first of all, various research papers

provided by library services (https://www.scopus.com) and publishers (https://www.sciencedirect.com; https://www.emeraldinsight.com; https://login.webofknowledge.com) were reviewed. To better outline the key aspects of AEO and to support or challenge the findings, this search has been integrated also by other data collected through websites, guidelines, etc.

As noted above, to the Authors' knowledge, this is the first research paper that analyses the FC and similarly denominated certificates: this certificate has never been subject to significant scholarly debate. It is for this reason that data are being collected through websites, guidelines and guidance notes suggested by various institutes.

This part of the essay used a wide range of sources of information in order to develop and analyse the FC and similarly denominated certificates.

In particular, attention was paid to websites of private companies operating in the business of issuing pre-shipment loading certificates and running the technological infrastructure behind it, as well as to public information available on websites of entities and other bodies located in African countries that help and provide assistance in the management of said certificates, particularly shippers' councils of some African countries.[12]

We are conscious of the weaknesses of such observation, which could appear to be selective (might miss facts) and less documented than an on-site observation (Tellis 1997; Yin 2013).

We have autonomously analysed all data obtained by literature review, websites, guidelines, and we finally compared our individual interpretation of the results.

3.7 Findings Discussion

The AEO authorization demonstrates how PPP may become a practical application: on the one hand, it enhances security and control with less physical checking for customs and, on the other hand, it reduces administrative charges and facilitates trade for business operators.

[12] In particular, reference in the research has been made to the websites of the Shippers Council of Eastern Africa (http://www.shipperscouncilea.org); Ogefrem website (http://www.ogefrem.net); Conselhos de carregadores africanos of Angola (http://www.cnc-angola.com); Fabema website (http://www.frabema.it/en/certificati/certificati.html).

Security measures have been introduced to prevent theft, deter illegal access to facilities and protect intellectual capital right.

Even if some companies state that AEO authorization has provided both collateral (indirect) and direct benefits, according to Fletcher (2007) it is crucial that customs organizations regularly document any quantified benefits to AEO participants, as a report made by an external source can be an invaluable confirmation of investment pay-back.

Some Authors (den Butter et al. 2012) have noticed that as this authorization is voluntary, with entry costs and associated benefits, on the one hand it may happen that compliant and trustworthy companies are not willing to get the authorization if they see no fair value for them to participate. On the other hand, opportunistic and fraudulent enterprises may perceive "*opportunistic benefits (with less checking, and simplified procedures may create chance for easier ways of committing fraud), relatively less compliance costs than good firms (they can make a false compliance report to show the fulfilment of the requirements), and thus are more willing to get the certificate*". They state that information technologies (hereafter, IT) are a key aspect to eliminate information asymmetry in PPP. The so-called "IT-enabled risk management" has two meanings: (i) information technology and information systems are the main focus for the assessment, and (ii) it refers to automated IT support, in the form of decision support systems, for the general risk-management approach.

Similar considerations can be made with reference to the above-mentioned FC system adopted in some African countries. This tool should also be considered a trade facilitation instrument, even if, differently from the case of the AEO status, there is no link between public and private parties.

In this regard, as mentioned before, customs administrations and clearance activities remain subject to an autonomous regime, with no connection to the pre-shipment loading notes fulfilment carried out by importing companies in agreement with African shippers' councils.

This element marks the most significant difference between the two tools as in this latter case—differently from the AEO program—no PPP partnership exists in any form.

3.8 Conclusions and Limitations/Further Steps

In accordance with the mapping of Portugal-Perez and Wilson (2012), trade facilitation (TF) measures include a "soft" dimension related to intangible issues (customs management, business environment and

transparency) and a "hard" dimension associated to tangible infrastructures (roads and ports). With reference to the soft dimension, some Authors (Liu and Yue 2013) suggest that it may be possible to increase the trade structure of a country by accelerating customs clearance procedures.

Both AEO and pre-shipment loading notes like the FC have in common the goal of simplifying flows of goods at international level and stimulating international transactions while minimizing risks. However, only the AEO is a tool able to accelerate customs clearance procedures in their respective country of application.

This being said, a critical aspect of AEO is that the authorization is not cost free and, as the companies have increasingly limited resources, many AEOs want their benefits to be commensurate with their level of investment.

On the other hand, a critical aspect of pre-shipment loading notes like the FC tools is that they do not provide any link with public customs activities, therefore their scope of application seems limited; if no change is made to this system, hurdles at customs level would not be mitigated in any way. In this case, the main application of pre-shipment loading notes would remain at the level of simplifying tracking of imported goods in the country of importation.

In any case, further research is needed as regards the scope of application of African pre-shipment loading notes like the FC used in the Democratic Republic of Congo, in order to better understand their legal and technical aspects with a view to providing additional insights and stimulating a widespread debate on pros and cons at academic level.

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CHAPTER 4

The Relevance of Climate Change Related Risks on Corporate Financial and Non-Financial Disclosure in Italian Listed Companies

Paola De Bernardi,
Francesco Venuti and Alberto Bertello

4.1 Introduction

International organizations, government leaders and other societal actors have been facing one of the greatest challenges in recent history: climate change (CC). Melting ice, rising seas, longer droughts, stronger storms, and threatened habitats have had and will have disastrous

P. De Bernardi (✉) · A. Bertello
Department of Management, University of Turin, Turin, Italy
e-mail: paola.debernardi@unito.it

A. Bertello
e-mail: alberto.bertello@unito.it

F. Venuti
ESCP EUROPE, Paris, France
e-mail: fvenuti@escpeurope.eu

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repercussions if our society does not adopt more sustainable approaches in the future. According to the last Assessment Report released by the Intergovernmental Panel on Climate Change (IPCC 2014), "Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history. Recent climate changes have had widespread impacts on human and natural systems […] Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level has risen".

Climate change has been identified as a central challenge for sustainable development by the United Nations 2030 Agenda for Sustainable Development. Especially, Goal 13 is calling for action to combat climate change and its impacts, while enhancing resilience, developing a sustainable low-carbon economy. In a scenario featured by a growing awareness upon global sustainability and development issues, countries have been called to strengthen their cooperation for enhancing adaptation and narrowing the gap between climate science and policy. During the 24th session of the Conference of the Parties (COP 24) to the United Nations Framework Convention on Climate Change (UNFCCC), the 196 participating countries approved the rulebook which will allow the Paris Agreement to become executive in 2020, replacing the existing Kyoto Protocol, signed in 1997 and came into effect between 2008 and 2012 (Testa et al. 2017). According to the definition released by the UNFCCC (2018), the Paris Agreement aims to bring "all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so. As such, it charts a new course in the global climate effort".

Climate change effects also have negative consequences for companies and businesses, increasing their level of risk. Companies, in order to be successful, have to adopt serious actions to measure and manage this potential risk that may deeply affect their businesses (Kunreuther et al. 2013). Moreover, recent policy changes in annual reporting such as the ones related to the European Directive on Non-Financial Disclosure (2014/95/EU), as well as the standards issued by the American Sustainability Accounting Standard Board (SASB), the G4 guidelines of the Global Sustainability Standard Board (GSSB), and the framework of the Integrated Reporting Council (IIRC) stressed the importance of extending sustainability issue and environmental risks within financial

report. Specifically, the need to set up a risk management framework to identify, detect, measure and mitigate sustainability risks within company strategy, policy, and business practices has been evidenced. Despite that, the industrial responses to climate change are still sparse and fickle (Testa et al. 2017). The evidence refers both to actions and presentations. Company communication by disclosure of financial and non-financial performances should be seen in fact as a crucial element of the legitimization process, because even if corporate activities reflect social values, legitimacy may be threatened when communication failure happens (Kouloukoui et al. 2018). Companies should recognize that disclosing climate-related information is their own responsibility since climate change is becoming a strategic risk (CDSB 2018) with both sustainable and financial implications.

The increasing policy makers' interest in ensuring the financial system resilience to every form of risk led, in April 2015, the G20 to ask the Financial Stability Board (FSB) to also consider climate risk. Eight months later the FSB launched the industry-led Task Force on Climate-related Financial Disclosures (TCFD) to develop recommendations on climate-related financial disclosures. The Task Force published its final recommendations in June 2017. The aim of this framework is two-fold: first, making disclosures more complete, consistent, and comparable and second, giving investors, lenders, and insurers more visibility of how organizations are exposed to climate-related risks and opportunities in the short, medium and long term. According to Eccles and Krzus (2017), there are several reasons to implement the TCFD recommendations. First of all, investors are increasingly incorporating climate change scenarios and climate risk management strategies into their investment processes and engaging with high-emitting companies. In addition, they are mobilizing to ensure companies take the recommendations seriously, reporting reliable and decision-useful climate-related financial information to price climate-related risks and opportunities effectively. Second, companies that lead in implementing the recommendations enacting strong climate and low-carbon energy policies will see significant economic benefits, and attract increase in investment that will create jobs in industries for the future. Third, the recommendations will likely affect regulation and companies that have not yet fulfilled the recommendations will probably try to catch-up, perhaps under time pressure and great expense.

Since TCFD recommendations have been introduced only recently, there is still a lack of investigation on their compliance. Generally, companies disclose on climate change, but the information reported is generally limited in regard to aspects such as the four categories of governance, strategy, risk management, and targets and metrics addressed by the TCFD recommendations. Hence, there is still a lack of empirical evidence on the readiness and quality of company climate change related risk disclosure. This is a quite underdeveloped topic in the literature, so moving on from such preliminary remarks, this paper, based on the legitimacy theory (Campbell et al. 2003; Deegan 2006, 2010; Kouloukoui et al. 2018), aims to foster a better understanding of (i) how and to what extent companies disclose on climate change risk in annual and standalone reports according to TCFD recommendations; (ii) what is the extent, depth, and global readiness of climate change risk disclosure and finally, and (iii) what category of Climate Change risks they mainly disclose.

The remainder of this paper is structured as follows. The next section discusses the theoretical framework and related literature. Section 4.3 describes the research design and method. Section 4.4 presents the results of our empirical analyses and discussion. Finally, Sect. 4.5 provides conclusions and limitations, suggesting possible avenues for further research.

4.2 Literature Review

4.2.1 Why Does Accounting and Disclosure on Climate Change Risk Matter?

This section presents an overview of the main research streams on climate change disclosure and the risks identified by scholars. Extensive literature underlined the importance of risk management, recognizing that its primary objective "is not to prevent or prohibit taking risk, but to ensure that the risks are consciously taken with complete knowledge and clear understanding" (Raghavan 2005, p. 528). Among the overall company's key risks, the need for companies to disclose more climate-related information and risks is constantly growing, with pressure to go mainstream in their enterprise risk management (Baumeister 2018). According to the recent definition issued by ISO 31000 (ISO 2018), a risk can be expressed as the "effect of uncertainty on objectives". In

every step of their processes and practices institutions have to deal with the potential element of risks that can lead them to an uncertain outcome, affecting the entity's performance and financial position (Alfiero et al. 2016; Carlon et al. 2003). Different research streams address the topic of climate risk disclosure. Kouloukoui et al. (2018), for instance, have focused their attention on understanding the relationship between the disclosure level of climate change risk-related information and companies' characteristics such as size, location, and percentage of women in the board of directors. Other researchers have analysed the relationship between business responses to climate change and companies' economic and financial performance (Hallenberg 2015; Lee 2012; Ziegler et al. 2011). Bui and De Villiers (2017), instead, deeply analysed the strategies that organizations take to respond to the risks and opportunities emerging from changing government climate change policies and the supporting management accounting adopted. According to their framework, there are five possible strategies depending on the respective levels of climate change and market opportunities: stable, reactive, anticipatory, proactive, and creative. Finally, Eccles and Krzus (2017), conducted a type of "field experiment" to evaluate how difficult it will be for Oil and Gas companies to implement the recommendations of the TCFD. Motivated by prior research, this paper responds to recent calls in the literature for more insight into the role of financial and non-financial disclosure (NFD) in integrating climate change risks in business strategy and practices (Bui and De Villiers 2017; Burrit et al. 2011; De Aguiar and Bebbington 2014).

Hence, what is meant by climate risk? According to the literature, the main climate-related risks highlighted by the scholars are: regulatory, technological, market, reputational, and physical (Brody et al. 2008; Busch et al. 2012; Gasbarro et al. 2017; Jakob and Steckel 2016; Lash and Wellington 2007; Meinel and Abegg 2017; Sakhel 2017; Weinhofer and Hoffmann 2010; Wittneben and Kiyar 2009)

As pointed out by Sakhel (2017), regulatory risks refer to potential regulatory changes implemented in response to climate change. Policy makers are responding to a crescent awareness of climate change in society enacting national and international climate regulations aimed to mitigate companies' negative impact on the climate (Rogelj et al. 2016). At the same time, regulations such as carbon taxes, emissions reduction requirement, and cap and trade systems could represent an additional cost for companies if not well managed (Lash and Wellington 2007;

Wittneben and Kiyar 2009). However, it is not yet clear how future carbon regulations will develop. The lack of a clear context might lead many firms not to adopt the necessary far-reaching investments such as renewable energy technologies and alternative supply chain arrangements for climate mitigation. As a matter of fact, many leaders would prefer a wait-and-see approach (Busch et al. 2012).

Technological risks can often be related to regulatory ones. The adoption of new technologies aiming at reducing emissions or innovative technology solutions that completely avoid emissions to guarantee a GHG independence (Kolk and Pinkse 2005; Sakhel 2017; Weinhofer and Hoffmann 2010) is often a response to the introduction of new regulation. As pointed out by Gasbarro et al. (2017), new technologies are often seen as an opportunity, but their adoption under environmental incertitude could also be risky.

Market risks play an important role since even more stakeholders have been demanding actions around climate mitigation in return for purchasing goods and services, investing capital or partnering (Busch et al. 2012), leading companies to disclose their activities or other attempts to communicate their carbon strategies (Sakhel 2017). According to Levy and Kolk (2002), companies' responses to climate-related market risks depend mainly on stakeholders and market partners' characteristics and the way they control critical resources. Despite the evidence that market pressures drive certain carbon strategies, only a few studies have focused their attention on the relation between market risks and corporate responses (Sakhel 2017). Climate-related market risks often overlap with regulatory and technological ones. As pointed out by Weinhofer and Hoffmann (2010), response measures that address regulatory climate risks serve as countermeasures to market risks as well. At the same time, most of these measures are reached through innovative technological solutions.

Reputational risks can be separated into two subcategories: direct (i.e., when they stem from a company's specific action), and indirect (i.e., when they refer to a public perception of the overall industry). In the climate change context, reputation risk can be explained as the probability of profitability loss due to a business' activity or position in endeavours or practices considered harmful (Engel et al. 2015). Reputational risk mainly affects companies that pursue to use products, processes, or practices with a negative impact on climate and those ones that operate in industries where brand loyalty is an important component of corporate value (Gasbarro et al. 2017; Lash and Wellington 2007).

Climate-related physical risks represent a challenge for companies. Scholars have identified some industries that are more sensitive to climate change. First, agriculture and tourism, namely those industries depending on specific conditions in terms of temperature and seasonality (Chowdhury and Moore 2017; Hopkins and Maclean 2014; Lash and Wellington 2007); second, energy, automotive, transportation, and the other sectors relying on large scale infrastructure (Winn et al. 2011); third, insurance because of its intrinsic nature (Johannsdottir 2014; Mills 2009). At the same time, physical risks characterize those industrial buildings located in climate-sensitive areas such as coasts and floodplains and with long-lived capital assets (Gasbarro et al. 2017). Despite some categories are more likely to be affected by physical climate effects, negative impacts can occur across a wider set of industries. These kinds of risks are recognized by companies and often incorporate at a strategic level but it is still unclear how they are perceived and countered compared to other categories of risks.

4.2.2 A Legitimacy Theory Lens to Explain Company Responsibility for Climate Change

There are many theories that can explain voluntary corporate disclosure. As pointed out by Dilling and Harris (2018) the main ones are the "stakeholder theory" (Freeman 2010), the "signaling theory" (Verrecchia 2001); the "agency theory" (Barako et al. 2006) and the "legitimacy theory" (Campbell et al. 2003; Deegan 2006, 2010). All of the theories mentioned above should be considered when analysing voluntary corporate reporting; however, our research has been developed adopting the legitimacy theory. According to it, a social contract is formed between the organizations and the society in which they operate, representing a set of implicit and explicit expectations of its members as to how they should act (Deegan 2006, 2010; Gray et al. 1995). In other words, legitimacy theory recognized that any organization has a social responsibility towards society (Dilling and Harris 2018; Testa et al. 2017). Companies have two main legitimization enabling factors: action and presentation. While the former refers to the activities developed by the company in congruence with social values, the latter refers to the disclosure of corporate activities in line with social values. Consequently, communication is a crucial element since legitimacy may be threatened because of communication failures (Kouloukoui et al. 2018). At the

same time, the identification of climate-related risks and their communication is actually considered as one of the first steps to design and implement climate-related strategies (Gasbarro et al. 2017; Kolk and Pinkse 2005; Weinhofer and Busch 2013). The implicit premise of the legitimacy theory is that society, as a set of individuals, allows an organization to continue to operate as long as the organization considers the rights of the general public, in accordance with society's expectations (Deegan 2006, 2010). The phenomenon that leads organizations to conform to society's expectations of behaviour in order to preserve legitimacy is called "isomorphism". With regard to climate risk, it can be associated with companies' willingness to support climate initiatives or to refrain from action (Testa et al. 2017).

4.2.3 The Recommendation of TCFD: Principles for Effective Disclosure

In September 2015, Mark Carney, Governor of the Bank of England, issued a clear warning about the Tragedy of the Horizon, stating that by the time climate change impacts financial stability, it will already be too late. Taking immediate action, the G20 asked the FSB to develop recommendations on climate-related financial disclosure. The FSB, chaired by Michael R. Bloomberg and consists of 32 experts from the financial and production sectors, published the TCFD with the aim to deliver a voluntary, consistent climate-related financial risks disclosure framework in order to provide material information to investors, lenders, insurers, and other stakeholders. TCFD recommendations should be included in organizations' mainstream (i.e., public) annual financial filings. In most G20 jurisdictions, public companies already have a legal obligation to disclose material climate information in their financial filings. However, the TCFD encourages organizations where climate-related risks and opportunities could be material in the future to begin disclosing climate-related financial information outside financial filings to facilitate the incorporation of such information into financial filings once climate-related issues are determined to be material (TCFD 2017). At the same time, the recommendations were developed according to existing climate change reporting frameworks, such as the SASB and the Global Reporting Initiative (GRI) in order to not force companies to invest in yet another new framework or guidelines or information. The report contains 11 recommendations divided into four thematic areas: governance, strategy, risk management, metrics, and targets (Fig. 4.1).

Governance	Strategy	Risk Management	Metrics and Targets
Disclose the organization's governance around climate-related risks and opportunities.	Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's business, strategy, and financial planning.	Disclose how the organization identifies, assesses, and manages climate-related risks.	Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities.
Recommended Disclosures	**Recommended Disclosures**	**Recommended Disclosures**	**Recommended Disclosures**
a) Describe the board's oversight of climate-related risks and opportunities.	**a)** Describe the climate-related risks and opportunities the organisation has identified over the short, medium and long term.	**a)** Describe the organisation's processes for identifying and assessing climate-related risks.	**a)** Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process.
b) Describe management's role in assessing and managing climate-related risks and opportunities.	**b)** Describe the impact of climate related risks and opportunities on the organisation's businesses, strategy, and financial planning.	**b)** Describe the organisation's processes for managing climate-related risks.	**b)** Describe Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG emissions, and related risks.
	c) Describe the potential impact of different scenarios, including a 2°C scenario, on the organisation's businesses, strategy, and financial planning.	**c)** Describe how processes for identifying assessing, and management climate-related risks are integrated into the organisation's overall risk management.	**c)** Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets.

Fig. 4.1 Four thematic area and 11 recommendations of TCFD (*Source* Recommendations of the Task Force on Climate-related Financial Disclosures)

Fig. 4.2 Linking climate change risk and opportunities to strategic planning risk management and financial impact (*Source* Recommendations of the Task Force on Climate-related Financial Disclosures)

Generally, companies disclose on climate change, but scarce information is still reported on these four categories and their relevant aspects.

The TCFD focuses its attention on different categories of risks as well. According to it, there are two types of risks: transition and physical. Transition risks can be sub-categorized into 4 groups: regulatory (policy and legal), technological, market-related, and reputational. Physical aspect, instead, can be grouped in acute and chronic, depending on the frequency and intensity (Fig. 4.2).

Even though a complete and correct approach to risk management should always compare and balance risks and opportunities, this study is mainly focused on the "risk-side". Identification of risks is easier and usually is the first step that comes before the analysis of the opportunities (that is more difficult and complex). If companies have not even reached a level of complete adherence and full satisfaction of the recommendations on risk disclosure, they are probably even further behind in the part concerning the analysis (and disclosure) of the related opportunities.

This paper aims at providing a better understanding of how and to what extent large Italian companies disclose on climate change risks in their annual and standalone reports according to TCFD recommendations. The analysis will be conducted investigating firstly the extent, depth, and global readiness of the selected companies on climate change risk disclosure

according to TCFD recommendations, and secondly, mapping the category of risk (and related impact) that climate change could have in each company.

4.3 Methodology and Data Collection

The major objective of this research is to examine the characteristics of the disclosure on climate change produced by non-financial companies listed in the FTSE MIB in their financial reports and/or related documents. The research question seeks primarily to identify the characteristics of the disclosure on climate change risk of the biggest Italian non-financial listed companies. The motivation to develop an answer to this question is informed by the fact that climate change is a significant environmental concern and hence how organizations respond to this agenda will dictate what outcomes might be achieved.

This analysis was developed using the lens of the legitimacy theory and adopting the TCFD framework described in the previous section. As reported by Eccles and Krzus (2017), the TCFD recommendations state that climate-related disclosures should be fully and harmoniously integrated into financial filings, including a discussion about the board's role in overseeing climate-related policy, legal, technology, and market risks and opportunities.

This research, that is the first step of a wider analysis of climate change risk disclosure, was developed following a research design implemented with the following steps:

1. Literature analysis
2. Sample selection
3. Data gathering and collection
4. Data analysis

After the analysis of the literature as well as the contribution of many reports and documents coming from academia, international institutions and practitioners, we have selected a sample of Italian listed firms. An empirical methodology was used to gather and analyse the required information from companies of the Italian FTSE MIB index. Italy FTSE MIB index includes the 40 Italian companies listed on the MTA (Borsa Italiana's Main Market) with greater capitalization, free float (i.e., Public float), and liquidity.

The choice of this sample of Italian companies was motivated by the fact that they are the biggest and "more visible", and, therefore, a higher level of attention to these aspects and a more detailed disclosure is expected from them. In other words, it is expected that these companies could be considered as "best practices" and "forerunner". As pointed out previously, TCFD expects that investors could be less inclined to invest in companies that do not implement the recommendations. Consequently, it is expected that large listed companies should be the most sensitive to this aspect and act accordingly.

Furthermore, the Italian context is deeply influenced by the existence of specific legal requirements (Decree 254/2016), that constitutes the national transposition of the European Directive 2014/95/EU, regarding disclosure of non-financial and diversity information by certain large undertakings and groups.

To ensure the consistency and comparability of data, banks, insurance companies, asset managers, and asset owner companies have been excluded from the sample, given that financial services organizations are subjected to specific financial and market risks, thus resulting in a hindrance of comparability with other industries, also due to the very specific regulatory requirements (i.e., Basel, Solvency, specific IFRS, etc.).

Excluding financial companies, the final sample was composed of 25 non-financial companies included in FTSE MIB in the year 2017, as presented in Table 4.1.

Table 4.1 Sample composition

Automobiles and components	4	16%
Construction and engineering	1	4%
Food	1	4%
Healthcare	1	4%
Household and personal products	3	12%
Industrial manufacturing	4	16%
Information technology	1	4%
Materials	1	4%
Media	1	4%
Oil and gas	2	8%
Telecommunication services	1	4%
Utilities	5	20%
Total	25	100%

Source Own elaboration

Table 4.2 Companies of the sample in high-risk sectors

Non-financial sectors identified by TCFD as most exposed to risk	*Companies of FTSE MIB*	*Number of companies reviewed*
Energy	Oil and gas	2
	Utilities	5
Transportation	–	–
Materials and buildings	Materials	1
	Construction and engineering	1
Agriculture, food, and forest products	Food	1
Total		10 (40% of the sample)

Source Own elaboration

It should be noted that 40% of the companies of our sample belong to non-financial sectors identified by the TCFD as most exposed to climate change risk, as presented in Table 4.2.

The third step of the research was data collection. The financial disclosure of the companies of the sample was examined, in particular the financial annual reports and related documents, such as the sustainability reports and the Non Financial Disclosure (thereafter, NFD). It was decided to focus the analysis on the annual reports, not only because of the various recommendations (the European Directive 2014/95/EU specifically and explicitly requires that this information shall be included and "reported in the annual financial statements"), but also because annual reports represent the most important tool for periodic companies' communication to a wide category of external stakeholders (Eccles and Krzus 2017). Moreover, the Task Force explicitly recommended that "preparers of climate-related financial disclosures provide such disclosures in their mainstream (i.e., public) annual financial filings". Furthermore, we have also examined additional documents such as NFD and Sustainability reports or specific report on climate change.

Only one company (ENI, which is also a member of the TCFD) published a specific document that provides detailed and specific information on climate change risk, following the recommendation of the TCFD in a quite complete way. Most of the other companies in the sample provided information on climate change risk both in their annual reports and in

Table 4.3 Type and number of analysed documents

Type of document examined	*Number of companies reviewed*	
Annual financial statements	22	
Separate NFI section		3
Sustainability report		18
Integrated report	3	
Specific separate document for CC	1	

Source Own elaboration

separate NFD and/or separate sustainability report. Only 3 companies presented an Integrated Report (IR) (Table 4.3).

The examined accounting period was 2017. The analysis was limited to one year not only because firm's disclosure policies are expected to remain constant over time (Abraham and Cox 2007; Botosan 1997), but also because the recommendations of the task force has been published only in 2017. One of the research aims was precisely to check to what extent the largest Italian non-financial listed companies were already ready and adhering to the recommendations of these guidelines in 2017.

For data collection and analysis of the information, two structured checklists had been designed, following the guidelines and the recommendation of the TCFD, one to measure the *extent* of the disclosure, the other to quantify the *depth*.

More specifically, the first checklist aimed at measuring the *extent* of the disclosure and was structured around the four key thematic areas that, according to the TCFD, represent core elements of how organizations operate. These four areas, according to the TCFD, are: ***governance*** (defined as the organization's governance around climate-related risks and opportunities), ***strategy*** (that is the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning), ***risk management*** (as the processes through which the organizations identify, assess, and manage climate-related risks), and ***metrics and targets*** (used to assess and manage relevant climate-related risks and opportunities).

Beneath these four areas, there are 11 more detailed recommendations, referred to as "recommended disclosures". According to the TCFD, these 11 recommended disclosures "build out the framework with information that will help investors and others understand how reporting organizations think about and assess climate-related risks and

opportunities". As previously stated, this research is only focused on the risk-side. An analysis of the related opportunities may be developed in further studies, with larger samples.

For each recommended disclosure, a set of parameters and a detailed checklist have been developed to measure the extent of the disclosure. The 25 companies examined were consequently scored against each of the 11 recommended disclosures with 0/1 (Yes/No) value. In this way, we have measured a proxy for the extent of the climate change risk disclosure of each company. The maximum possible extent would be to fully satisfy the 11 recommended disclosure on the 4 areas.

Tables 4.4, 4.5, 4.6, and 4.7 present the detailed structure of the 11 recommended disclosures, grouped for each of the 4 key areas.

The second checklist aimed at measuring the *category of climate change risk disclosure* (assuming that the impacts and perceptions of climate risk are different for the companies in the sample) and was structured following the TCFD terminology that suggests two broad types of climate-related risks: physical and transitions risks. These two types of risks are divided into categories and subcategories. The subcategory risks described under each major category are not mutually exclusive, and some overlap may exist. The highest is the number of the risk that each

Table 4.4 Recommendation and checklist for the governance area

1. GOVERNANCE	
Recommendation: Disclose the organizations governance around climate related risks and opportunities	
a) Describe the board's oversight of climate-related risks and opportunities.	*b) Describe management's role in assessing and managing climate-related risks and opportunities.*
i) processes and frequency by which the board and/or board committees are informed about climate-related issues; ii) whether the board and/or board committees consider CC related issues when reviewing and guiding strategy, risk management policies, annual budgets, and business plans as well as the organization's performance objectives, monitoring implementation and performance, and overseeing major capital expenditures, acquisitions, and divestitures, and iii) how the board monitors and oversees progress against goals and targets for addressing climate-related issues.	i) whether the organization has assigned climate-related responsibilities to management-level positions or committees; and, if so, whether such management positions or committees report to the board or a committee of the board and whether those responsibilities include assessing and/or managing climate-related issues; ii) a description of the associated organizational structure(s); iii) processes by which management is informed about climate-related issues, and iv) how management monitors climate-related issues.

Source Elaborations on TCFD (2017)

Table 4.5 Recommendation and checklist for the strategy area

2. STRATEGY		
Recommendation: Disclose the actual and potential impacts of climate related risks and opportunities on the organizations businesses, strategy, and financial planning		
a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	*b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.*	*c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2° C or lower scenario*
i) a description of what they consider to be the relevant short-, medium-, and long-term time horizons, taking into consideration the useful life of the organization's assets or infrastructure; ii) a description of the specific climate-related issues for each time horizon that could have a material financial impact on the organization, and iii) a description of the process(es) used to determine which risks and opportunities could have a material financial impact on the organization (Organizations should consider providing a description of their risks)	i) Describe the impact on businesses and strategy in the following areas: i) Products and services; ii) Supply chain and/or value chain; iii) Adaptation and mitigation activities iv) Investment in research and development; v) Operations (including types of operations and location of facilities). ii) Describe how climate-related issues serve as an input to their financial planning process, the time period(s) used, and how these risks and opportunities are prioritized. iii) Disclose the impact on financial planning in the following areas: Operating costs and revenues; Capital expenditures and capital allocation; Acquisitions or divestments and Access to capital.	i) Where they believe their strategies may be affected by climate-related risks and opportunities; ii) how their strategies might change to address such potential risks and opportunities; and iii) the climate-related scenarios and associated time horizon(s) considered. **Supplemental Non Financial Group:** Description targets: ii) i) whether the target is absolute or intensity based; iii) ii) time frames over which the target applies; iv) base year from which progress is measured, and v) iv) key performance indicators used to assess progress against targets
	Supplemental Non Financial Group. Climate Change Integration into their (1) current decision making and (2) strategy formulation, including planning assumptions and objectives around climate change mitigation, adaptation, or opportunities such as: i) Research and development (R&D) and adoption of new technology. ii) Existing and committed future activities such as investments, restructuring, write-downs, or impairment of assets. iii) Critical planning assumptions around legacy assets, for example, strategies to lower carbon-, energy-, and/or water-intensive operations. iv) How GHG emissions, energy, and water issues, if applicable, are considered in capital planning and allocation; this could include a discussion of major acquisitions and divestments, joint-ventures, and investments in technology, innovation, and new business areas in light of changing climate-related risks and opportunities. v) The organization's flexibility in positioning repositioning	

Source Elaborations on TCFD (2017)

Table 4.6 Recommendation and checklist for the risk management area

3. RISK MANAGEMENT		
Recommendation: Disclose how the organization identifies, assesses, and manages climate-related financial risks		
a) Describe the organization's processes for identifying and assessing climate-related risks.	*b) Describe the organization's processes for managing climate-related risks.*	*c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.*
i) How the relative significance of climate-related risks is determined in relation to other risks; ii) whether existing and emerging regulatory requirements are considered related to climate change (e.g., limits on emissions) as well as other relevant factors considered; iii) the processes for assessing the potential size and scope of identified climate-related risks; iv) definitions of risk terminology used or references to existing risk classification frameworks used.	i) How they make decisions to mitigate, transfer, accept, or control those risks; ii) ii) the processes for prioritizing climate-related risks, including how materiality determinations are made within their organizations (addressing the risks presents in the map of risks)	How their processes for identifying, assessing, and managing climate-related risks are integrated into their overall risk management

Source Elaborations on TCFD (2017)

company identifies and measures for each subcategory, the deepest can be considered the disclosure.

The 25 examined companies were consequently scored against each of the 6 categories, see Table 4.8.

Finally, based on all the previous assessments, an overall evaluation was made, scoring globally the company's disclosure on climate change risk ranging from 0 (not publically disclosed) to 5 (detailed, complete, and material disclosure). This measure will be a proxy for the readiness and adherence to the TCFD disclosure.

The analysis of the data collected and other information from companies' websites and other reports is reported in the following section.

4.4 Findings and Discussion

In order to assess TCFD preparedness of the selected sample of Italian listed companies, the existing state of climate disclosure was examined following the steps described in the previous section.

Table 4.7 Recommendation and checklist for the metrics and target area

4. METRICS AND TARGETS		
Recommendation: Disclose the metrics and targets used to assess and manage relevant climate-related financial risks and opportunities		
a) Disclose the metrics used by the organization to assess climate related risks and opportunities in line with its strategy and risk management process.	*b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.*	*c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.*
i) Provide the key metrics used to measure and manage climate-related risks and opportunities (organizations should consider including metrics on climate-related risks associated with water, energy, land use, and waste management where relevant and applicable); ii) describe, where climate-related issues are material, whether and how related performance metrics are incorporated into remuneration policies; iii) provide the internal carbon prices as well as climate-related opportunity metrics such as revenue from products and services designed for a lower-carbon economy (organizations should provide metrics for historical periods to allow for trend analysis and, where not apparent, a description of the methodologies used to calculate or estimate climate-related metrics).	Provide i) their Scope 1 and Scope 2 GHG emissions and, if appropriate, Scope 3 GHG emissions and the related risks (GHG emissions should be calculated in line with the GHG Protocol methodology to allow for aggregation and comparability across organizations and jurisdictions); ii) accepted industry-specific GHG efficiency ratios; iii) GHG emissions and associated metrics should be provided for historical periods to allow for trend analysis; iv) where not apparent, a description of the methodologies used to calculate or estimate the metrics.	1.) Describe their key climate-related targets (such as those related to GHG emissions, water usage, energy usage) in line with anticipated regulatory requirements or market constraints or other goals, i) whether the target is absolute or intensity based; ii) time frames over which the target applies; iii) base year from which progress is measured; iv) key performance indicators used to assess progress against targets and v) where not apparent, a description of the methodologies used to calculate targets and measures. 2.) Include efficiency or financial goals, financial loss tolerances, avoided GHG emissions through the entire product life cycle, or net revenue goals for products and services designed for a lower-carbon economy.
Supplemental Non Financial Group: i) organizations should provide historical trends and forward-looking projections for all relevant metrics (by relevant country and/or jurisdiction, business line, or asset type) and ii) disclose metrics that support their scenario analysis and strategic planning process and that are used to monitor the organization's business environment from a strategic and risk management perspective; iii) provide key metrics related to GHG emissions, energy, water, land use, and, if relevant, investments in climate adaptation and mitigation that address potential financial aspects of shifting demand, expenditures, asset valuation, and cost of financing.		

Source Elaborations on TCFD (2017)

Table 4.8 Type, category and subcategory of climate-related risks

Type	*Category of climate-related risks*	*Subcategory of climate-related risks*
Transition	Regulatory (policy and legal)	Exposure to litigation
		Increased pricing of GHG emissions
		Enhanced emissions-reporting obligations
		Mandates on and regulation of existing products and services
	Technology	Substitution of existing products and services with lower emissions options
		Unsuccessful investment in new technologies
		Costs to transition to lower emissions technology
	Market	Changing in consumer behaviour (changes in the demand for products and services resulting from changes in customer attitudes)
		Uncertainty in market signal
		Fluctuating socioeconomic conditions
		Increased cost of raw materials
		Investors' divestments from fossil fuel and carbon-intensive companies
	Reputation	Shifts in consumer preferences
		Stigmatization of sector
		Calling for boycotts, media and public opinion pressure for climate change
		Increased stakeholder concern or negative stakeholder feedback
Physical	Acute	Increased severity of extreme weather events
		Changes in the frequency of precipitation, floods and droughts
		Tropical cyclones (hurricanes and typhoons)
		Change in temperature extremes
		Snow and ice
	Chronic	Changes in mean (average) precipitation
		Change in mean (average) temperature
		Other physical climate drivers
		Induced changes in natural resources
		Rise in sea levels

Source Own elaboration on TCFD

Table 4.9 GRI, SDGs, CDP, and TCFD in examined companies

	#Yes	*Yes (%)*	*#No*
Has the company adopted GRI?	25	100	0
GRI Standard	*11*	*44*	
G4	*14*	*56*	
Is there an explicit reference to the UN Global Compact?	14	56	11
Is there an explicit reference to the UN SDGs?	21	84	4
Is there an explicit reference to UN SDG 13?	15	71	6
Does the company adhere to the CDP?	15	60	10
Does the company adhere to the TCFD?	4	16	21

Source Own elaboration

First of all, we have examined additional elements in companies' disclosures that give more light in understanding their approach. As it can be seen from Table 4.9, all the examined companies adopted GRI (44% adopted GRI standard and 56% are "still" following G4). Most of the companies mentioned explicitly in their reports the UN SDGs (84%), but only 71% explicitly mentioned the Goal #13 on climate change actions. More than half of the companies adhere to CDP, but only 16% adhere officially to the TCFD.

First of all, it should be noted that we found more information relevant to the TCFD's recommendations in voluntary separate reports rather than in official financial statements. This is not totally in line with the recommendations of TCFD that explicitly require an integration of this information in official annual financial reports as climate change should be analysed as risks and opportunities related to strategic planning risk management and financial impact (as pointed out previously the Sect. 4.2). Sometimes, climate change disclosures are made in multiple reports rather than being well integrated in the annual official financial statements.

In general, we could say that for the extent of the disclosure, the examined companies are only 50% ready according to the TCFD disclosure recommendation on climate change.

		Total YES	Total NO	TOT	
Governance	a) Describe the board's oversight of climate-related risks and opportunities.	5	20	25	20%
	b) Describe management's role in assessing and managing climate-related risks and opportunities.	5	20	25	20%
					20%
Strategy	a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	6	19	25	24%
	b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	14	11	25	56%
	c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	6	19	25	24%
					35%
Risk Management	a) Describe the organization's processes for identifying and assessing climate-related risks.	18	7	25	72%
	b) Describe the organization's processes for managing climate-related risks.	25	0	25	100%
	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	18	7	25	72%
					81%
Metrics and Targets	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	13	12	25	52%
	b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	25	0	25	100%
	c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	11	14	25	44%
					65%

Fig. 4.3 The extent of the disclosure on the 4 key thematic areas (*Source* Own elaboration)

Besides that, there are many differences among the four key thematic areas. Risk management disclosures were generally well done and quite complete, adhering to the recommendation for more than 80%. Also the disclosure about metrics and targets, generally speaking, were above the average level, with an average "adherence" of 65%. On the other hand, disclosures were weaker and well below the average for Governance and for Strategy. The deficiencies were directly related to the 11 specific disclosure recommendations of the TCFD. Figure 4.3 summarizes the average level of "adherence" for each key thematic area.

Table 4.10 reports the percentage of companies of the sample that follow correctly the required 11 detailed recommendations of the TCFD. As can be seen, for the strategy, metrics, and target there are quite big differences among the specific recommendations. For example, all the examined companies disclosed Scope 1, Scope 2, and Scope 3 greenhouse gas (GHG) emissions, but less than half of them described the targets used by the organization to manage climate-related risks and opportunities and performance against targets.

The "Governance" seems to be the most problematic area. Most of the companies do not describe satisfactorily neither the board's oversight of climate-related risks and opportunities nor the management's role in assessing and managing these risks and opportunities.

Table 4.10 The extent of the disclosure on the 11 recommendations

Governance	a. Describe the board's oversight of climate-related risks and opportunities	20%
	b. Describe management's role in assessing and managing climate-related risks and opportunities	20%
Strategy	a. Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term	24%
	b. Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning	56%
	c. Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario	24%
Risk management	a. Describe the organization's processes for identifying and assessing climate-related risks	72%
	b. Describe the organization's processes for managing climate-related risks	100%
	c. Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management	72%
Metrics and targets	a. Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process	52%
	b. Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks	100%
	c. Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets	44%

Source Own elaboration

Table 4.11 Disclosure level for type and category of risks

Type	*Category*	*Disclosure level (%)*
Transition	Regulatory	12.57
	Technology	12.00
	Market	8.00
	Reputation	7.00
Physical	Acute	23.20
	Chronic	16.00

Source Own elaboration

As for the different types and categories of risks disclosed, the physical risk is the one reported by the highest number of companies, both for the category "acute" (e.g., those risks that are event-driven, including

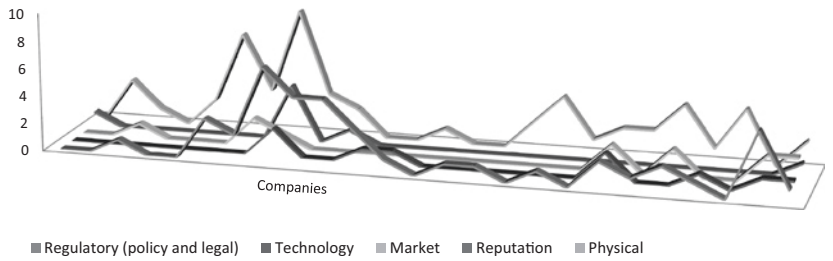

Fig. 4.4 Categories of risks disclosure for each company (*Source* Own elaboration)

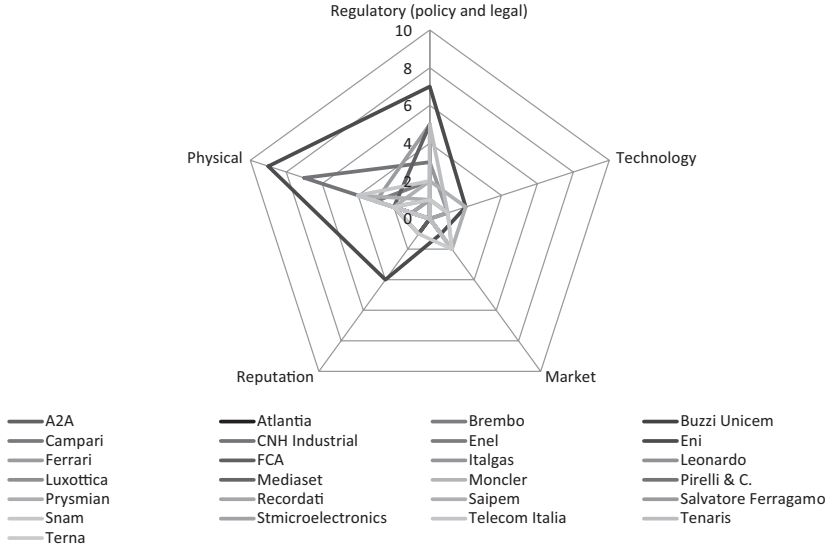

Fig. 4.5 Categories of risks disclosure for each company (*Source* Own elaboration)

cyclones, hurricanes, or floods) and for "chronic" (e.g., longer-term shifts in climate patterns such as sustained higher temperatures that may cause sea level rise or chronic heat waves). The less disclosed category of risk is the reputation, related to the potential change in customer or community perceptions of an organization's contribution to (or detraction from) the transition to a lower-carbon economy (Table 4.11).

Figures 4.4 and 4.5 present the level of disclosure of each company, broken down by risk category. Acute and chronic risks have been grouped together as "physical risk". The results confirmed that the situation is extremely heterogeneous, both between the various risk categories and between the different companies.

More specifically, Fig. 4.4 shows for each company (horizontal axis) the number of risks identified and disclosed by the company for each of the four areas. As can be seen, there are quite evident differences among the areas. For many of them, there is still a large room for improvement.

Only a couple of companies present satisfactory levels for at least some risk categories, but most companies report on average a very limited disclosure and they are still quite far from the recommendations of the TCFD.

Examining the materiality matrix for the climate change risk, only one company did not publish its materiality matrix and 8% of the companies did not even mention this type of risk in their matrix. Most companies (64%) include in their matrix only partial or vague risk (e.g., gas emissions, pollution, energy consumption, plastic wastes, etc.) obviously related also to climate topics, but without mentioning explicitly the climate change risk.

Among companies that explicitly include climate change risk in the materiality matrix, most of them (67%) identify climate change risk related to a high materiality level (Table 4.12).

Finally, the global level of adherence and readiness of companies' disclosure to the TCFD recommendation is reported in Fig. 4.6. As previously highlighted, globally we could say that the level of readiness is around 50%. Large differences exist among different areas. While a high

Table 4.12 Climate change risk and materiality matrix

There is NO materiality matrix in their reports	4%
There is NO climate change (CC) risk in their materiality matrix	8%
Vague/general/partial CC risk in the materiality matrix	64%
CC risk in the materiality matrix	24%
–High materiality	*67%*
–Medium to high materiality	*17%*
–Low or no materiality	*17%*

Source Own elaboration

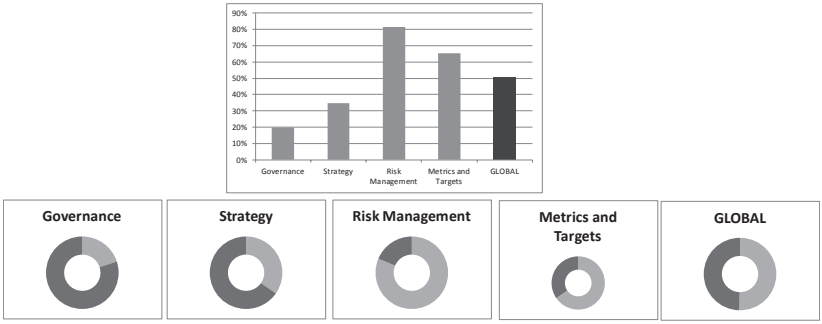

Fig. 4.6 The level of readiness of companies to TCFD (*Source* Own elaboration)

level of adherence is shown for the risk management area, for the governance there is still a lot of room for improvements.

In line with Eccles and Krzus (2017), even if there is still a lot of work to be done, FTSE MIB non-financial companies "won't be starting with a blank sheet of paper". While there are some companies that have already made significant progress in adopting TCFD recommendations, for many others the path to achieve a good level of adherence to TCFD recommendations is still quite long.

Surely this constitutes a significant divergence from the evolution of stakeholders' expectations at the global level. As previously indicated, recent studies have reported that about one out of four investors (27%) expects significant improvements in the dissemination of organizations on climate risks and how they are managed. At the moment, therefore, among the aspects of the TCFD recommendations, "governance" and "strategy" are mostly insufficient, and even the dissemination of "metrics and targets" has been scarce for some sectors.

4.5 Conclusion, Limitations and Further Steps

One of the results of the research is that, at a general level, at least for the companies of our sample, a comprehensive climate risk report compliant with the TCFD recommendation has not been produced yet. Since the examined companies are the largest and most relevant, it is reasonable to think that for companies of a considerably smaller size the situation could be even worse. The distance is significant (albeit in a different way

between the different areas and categories of climate risk) even in sectors that, as highlighted in Sect. 4.2, are considered highly risky.

Quite big and evident gaps in the information disclosed across the examined companies—specifically on the financial impact of climate risk—are undeniable.

Only two companies (ENI and ENEL) stand out clearly in providing the most solid information. For all other companies, the information provided is much more limited, and in some cases, superficial and still quite far from the recommendations of the TCFD. Although companies that achieve a high level of compliance with the TCFD guidelines are still too small, this still demonstrates that the TCFD recommendations can be adequately met. The disclosures of Eni and Enel can provide a good initial roadmap for all listed companies.

Particularly, it has been noted, firstly, that often the information already held or disclosed by companies simply needs labelling or cross-referencing to highlight its relevance to the assessment of climate-related risks. Moreover, the authors argue that company disclosures should enhance deep cross-departmental collaboration that supports the integration and connectivity of climate change issues into governance, risk management, planning, and control processes to facilitate company-wide assessment. It should be noted that the categories of disclosure identified by the TCFD framework are well within the ambit of Companies' Boards oversight. The information that should be disclosed are rooted in the analysis about what a specific company's board is doing today (and what should do in the future) to evaluate better both the risks and the opportunities related with changes in the physical environment, in the regulatory environment, and the necessary transition to a lower-carbon economy. Furthermore, information, strategies, results, and ambitions relating to climate change are often widely dispersed and disconnected (e.g., mainstream reports, sustainability reports, submissions to surveys of rating agencies, investor presentations, etc.). Finally, as "the direction of travel is quite clear", it needs improved transparency and rigour in how climate-related disclosures are prepared. For example, this includes methodologies and operational/organizational boundaries used for reporting, as well as the assurance processes applicable both to financial and non-financial information.

In our opinion, the disclosure in line with the TCFD recommendations should not be considered by companies and their directors as just merely a "compliance" activity. On the other hand, it should be

considered as a significant risk management opportunity and strategy, as well as an effective response to the increasing market demand for robust climate risk disclosure. This disclosure activity would also provide significant commercial benefits.

Additionally, more efforts should be made to better integrate climate change risk disclosure within annual reports, providing also more information and evidence on the financial implications.

This paper contributes to the literature on both financial and NFD because TFDC recommendations, that have been defined by the TCFD itself 'without historical precedent', highlight the need to consider the financial implications of climate change which has been usually up to date been considered as a non-financial aspect (Eccles and Krzus 2017).

The paper has also practical implications since it highlights that companies may gain a competitive advantage by proactively responding to voluntary disclosure (Depoers 2000) initiatives as these are increasingly being translated into law requirements. In general, a suggestion for more integration of climate change into governance processes with "Board buy-in" should be desirable.

Like all studies, this paper presents several limitations. The sample size is one of the most common limitations of studies like this one that employs analysis techniques using hand-collected data. Even though one of the major purposes of the study was specifically identified in showing how the biggest listed Italian companies disclose on climate change risk, the sample of 25 companies may be considered too limited. Moreover, the analysis was conducted only for one specific year (even though there are specific reasons for this choice, as explained in Sect. 4.2) and it was focused only on "risk-side", without considering also the "opportunities" that could arise. Analysing different contexts and employing a longitudinal analysis may advance the insights on this topic. Future research lines may also consider relevant factors that might moderate the relationship between climate change risk disclosure and reputation, stock volatility, and cost of capital.

This paper is an analysis of the existing disclosure (i.e., financial statements) in order to "measure" and capture the "level of readiness" of the major Italian listed companies. Further steps of the research to enhance company disclosures may also include: (i) a focus on a more holistic climate change disclosure, including the analysis of opportunities; (ii) an expansion of the sample to a significant number of companies that are the expression of more diversified sectors, including also the financial

sector (banking and insurance companies offer interesting and promising insights); and (iii) a comparison with companies that have been involved in the pilot projects to understand how best practices have added knowledge on the topic.

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CHAPTER 5

Risk Assessment and Environmental Impacts: Economic and Social Implications

Maria Claudia Lucchetti, Gabriella Arcese, Olimpia Martucci and Chiara Montauti

5.1 Introduction

The M.I.D.A. project (Methodologies for environmental damage identification) was born from the collaboration between the Department of Business Economics of the Roma Tre University and ISPRA; it has created the opportunity to develop a model that can give an assessment of environmental damage based on the Life Cycle Impact Assessment (LCIA).

The risk related to environmental deterioration and damage to ecosystems, which have significant and weighty effects on human health, is mainly due to pollution deriving from human activities and in particular, from industrial production activities.

The main consequences deriving from this type of damage is not only the source of one of the main threats to human health but is also the main cause of loss of biodiversity. For this reason, environmental regulatory systems, especially OECD countries, apply to owners and operators of the aforementioned harmful activities, the responsibility for

M. C. Lucchetti (✉) · G. Arcese · O. Martucci · C. Montauti
Department of Business Studies, Roma Tre University, Rome, Italy
e-mail: mariaclaudia.lucchetti@uniroma3.it

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environmental damage, which is configured as the obligation to sustain the costs related to environmental restoration but which does not require any evidence of negligence or non-compliance. Who is held responsible for the damage is obliged to restore to a legal or administrative order based on the provisions of a specific project. To recover the costs of rehabilitation, the authorities have sanitary measures, to recover the costs of restoration and rehabilitation, in the event that there is a real and effective threat to human health or the environment. The quantification of environmental damage does not have a reference model at international level: this deficiency has as its main consequence that of not being able to proceed to comparisons that analyze the emerging results between different companies but active in the same production area.

The literature review process made it possible to clarify and examine the existing and applicable methodologies for the assessment of both real and potential environmental damage. The reference framework that emerges from this work is intended to be useful for identifying the critical issues that may occur in business contexts, allowing the application of a strategy of complete sustainability. In this way it may be easier to apply the correct evaluation and risk management practices.

5.2 General Background

The number of companies that perceive the environmental variable as an essential element for their business management is certainly growing, as they are increasingly interested in meeting the objectives of full sustainability.

The main reason for which companies are increasingly paying attention to environmental issues arises primarily from the obligation to adhere to and comply with the provisions of environmental regulations.

In the field of environmental legislation, for example, the committee's report to the council and the European parliament on environmental responsibility for the prevention and remedying of environmental damage, describes successful actions and difficulties that the countries belonging to the EU have lived in the application of Directive 2004/35/EC on environmental liability in relation to the prevention and remedying of environmental damage between 2007 and 2013.

The aforementioned directive deals with significant environmental damage and concerns the implementation of the "polluter pays" principle enshrined in Article 191 of the Treaty on the Functioning of the European Union.

As is known, the "polluter pays" principle provides for the exemption by citizens of the payment of environmental damage caused by an industrial activity: they are in fact to be recognized as responsible for the environmental damage caused by the operators.

The objective of the directive is to act before environmental damage can take place, in the case of proven or presumed imminent threat, or to intervene through remedial action in case the damage has already occurred. In this last case, the directive clarifies that the environmental damage is considered repaired only when the state of the damaged environment re-presents the same original characteristics and conditions.

Therefore, because of the stringent and increasing legislation present at national, community and international level, many companies have activated various systems of containment and prevention of environmental damage. A further example is provided by the growing willingness of companies to voluntarily adhere to the ISO 14001 standard on environmental management systems. The voluntary adhesion to ISO 14001, a company has the possibility not only to achieve the preestablished environmental objectives but also to exercise continuous monitoring on its environmental performance and to keep under control any critical environmental situations of its production systems.

Therefore, the management of environmental risk assumes an important connotation that must be taken into consideration, since with the occurrence of damage to the environment, the company incurs sanctions and must take into account the internalization of the costs of the negative externalities produced, on the environment and on society and also must take into account any economic effects produced by a loss of image between its customers and consumers.

With the actions and practices of pollution prevention, companies therefore tend to use processes, techniques, materials, products, services or energy sources that seek to completely eliminate the occurrence of damage.

Obviously, every company works in different fields and sectors, so the actions to be implemented in the field of environmental risk prevention will also depend on these factors and the context in which the company is involved.

Risk management decisions are strongly influenced by the action that is exercised by different areas such as political, economic and social, but also by research, technical feasibility and risk assessment.

In particular, the management and assessment of environmental risk requires the adoption by companies of suitable instruments to avoid the occurrence of environmental damage attributable to an incorrect or dangerous exercise of its production.

Continuous monitoring of the most critical production activities is a prerequisite for many operators takes into consideration, but it is not the only action to be taken.

For this reason, it is useful to consider the multiplicity of environmental stress factors that can negatively affect ecosystems. Given the fundamental characteristics of ecosystems such as complexity and their mutual interconnection, an Environmental Risk Assessment should be carried out.

According to the definition provided by the US Environmental Protection Agency (US EPA), the ecological risk assessment is the process that establishes the probability of negative effects on the environment due to exposure to one or more factors of ecological stress.

It is a procedure that makes it possible to establish, with a satisfactory degree of scientific rigor, the amount of risks associated with a given stress factor.

On a regional scale, stress factors relevant to environmental risks are typically "multiple", as there are numerous effects deriving from several causes that lead to a significant deterioration of the environment and ecosystems (pollution of groundwater, chemicals, change in land use).

The main objective is to try to define the cause–effect relationship to prevent damage, through the definition of planning and management strategies. In the event that the damage occurs, actions must be taken that report the affected environment to its original state, or at least, if this is not possible, of improvement.

As already widely debated, the impacts on environmental resources at the regional level derive from human activity. From this derive the multiple stress factors that, given their characteristics, differ from each other by type.

Basically the following types of multiple stressors are identified from human action, which have regional impacts:

- Exhaustion or disappearance of species due to over-exploitation of resources and which involves numerous indirect effects.
- hydrogeological instability and pollution of groundwater.

- Change in land use for the agricultural sector and expansion of urban development.
- Release of substances and chemical agents from production activities.
- Variations in species composition and alteration of ecosystems due to the more or less intentional introduction of exotic species.

The assessment of environmental risk on a regional scale is further complicated given the characteristics of different intensity and spatial-temporal frequency, different for each risk factor (Ashauer and Brown 2013).

Given the large number and nature of multiple stressors, it remains highly difficult to establish what are the cause–effect connections of environmental risk. However, it is clear that these derive directly from actions taken to create the conditions of economic development and population growth.

An adequate forecast of environmental risk requires a significant amount of data to be used in complex environmental models. These models offer scientists the ability to formulate different scenarios, providing useful information to managers and policymakers.

To verify the effects that exist between environmental stressors and the influence on the ecosystem, it is necessary that the ecological models include within them all the processes and the different biological entities that are influenced by the factors themselves (Forbes and Calow 2013).

5.3 Literature Review

Based on the work of reviewing the literature, the works that allow us to achieve the objective of the present study have been identified.

With the literature review, the techniques for calculating and assessing environmental damage and the main objectives that have been pursued have been highlighted.

Starting from the analysis of the documents, the work of Amann and Lutz (2000) highlights the evolution of the European ozone regulation with the aim of verifying the impact of human health benefits on the implementation of environmental policies through a willingness to pay approach (WTP).

The OECD for the assessment of environmental damage mainly uses cost–benefit analysis as a tool: the report “Cost benefits analysis and the environment: recent development”, conducted by Atkinson et al. (2006),

which in recent years has represented the main point of reference for the assessment of environmental damage, contains a cost-effectiveness analysis that integrates information on the economic, technical, physical and biological aspects of ozone pollution and abatement. The report, in particular, analyzes the methodology of cost-benefit analysis that is applied to environmental issues, and contains information on decision-making rules, cost management, total economic value, evaluation of revealed preferences, assessment of declared preferences, value of the option, evaluation of ecosystem services, value of health/life and net worth including the value of a statistical life, sustainability, benefits transfer, decision-making and political orientation.

In Bickel et al. (2013), the impact is estimated for the estimation of the marginal environmental cost of transport through a bottom-up approach using the WTP methodology.

Through the use of the Disability-Adjusted Life Year (DALY), Borruso (2008) develop in their work a methodology for the estimation of costs deriving from atmospheric and acoustic pollution.

This study demonstrates the main motivations for which it is better to consider life expectancy rather than the number of deaths, in the quantification of the effects produced by pollution in terms of years of life lost.

In the work "Final Report on the Monetary Evaluation of Mortality and Morbidity Risks" from air pollution by Desaigues et al. (2007), he demonstrates the appropriate metric for the assessment of the impact of air pollution on human health through the calculation of life expectation.

The ExternE methodology (External Cost of Energy 1995–2005) is widely recognized and widely accepted by the scientific community as a world reference in the field of environmental damage assessment.

This method exposes a classification of the technologies used according to their social and environmental impact and provides for internalizing external costs, through a system of taxation of the most damaging technologies or through the subsidization of technologies recognized as cleaner and healthier, which contribute to achieve a more sustainable world.

In particular, ExternE, through an "impact pathways approach" (IPA), determines the external impacts and associated costs arising from the supply and use of energy.

Also the work of Hainoun et al. (2010) is based on an IPA approach. In particular, the environmental impacts deriving from the Syrian electricity generation system and atmospheric pollutant emissions are studied.

In the work, the costs associated with external damage to human health are assessed and the results derived from it indicate that the environmental impacts entail a significant increase in costs outside the typical cost of production.

Holland and Krewitt (1996) use the Value of a Life Year methodology (VOLY) and Value of a Statistical Life (VSL) with the aim of defining the concept of "total economic value" through the use of technical evaluations.

In particular, the VOLY is defined as the monetized value of a statistic increase in life expectancy of one year while the VSL results as the marginal rate of substitution between income and mortality risk: this indicator therefore allows to measure the speed through which individuals are willing to exchange money for a reduction in the risk of death.

VSL and VOLY represent alternative notions of WTP given a specific reduction in the risk function of a population, which link the risk of mortality in a specific period with the increase in life expectancy (Hammitt 2007).

An important contribution to understand the potential of damage caused by environmental pollution is provided by the work of Kahn J. and Yardley J. (2007) in which the strong impacts of deterioration and environmental pollution in China are exposed and outlined.

Krewitt et al. (1998) as part of the Life Cycle Assessment (LCA), have used the IPA approach for quantifying and assessing the environmental impacts resulting from power generation technologies.

The use of this approach seeks to carry out not only a comparative assessment of environmental damage resulting from electricity generation and transport technologies but also an assessment of environmental policy measures in the energy sector.

Rabl et al. (2003) demonstrate through the existing relationship between results from epidemiological studies on mortality caused by air pollution and impact indicators, that the mortality rate is not significant in relation to air pollution and shows that the loss of life expectancy (LLE) is configured as an indicator of timely impact.

In the recent years, some research papers are published and increasing the theoretical framework on this issue. In detail, there has been a growing scientific contribution that has recently developed on the theme of pollution and the environmental impacts that derive from microplastics that have allowed us to deepen and consolidate knowledge on this issue (Barboza and Gimenez 2015; Kramm and Volker 2018). For this reason,

Everaert et al. (2018), considered it appropriate to carry out an assessment of the marine environmental risk of microplastic concentration in the oceans, based on current available data and forecasts on the quantity of plastics and particles concentrated in marine environments, developing a reference framework up to 2100.

The evaluation carried out consists of an assessment of the risk of exposure and the effects, as well as of a risk characterization process for marine ecosystems. The data that have been used for this purpose are those available in the literature.

The evaluation process aims to assess how and if microplastics are a potential risk in marine ecosystems. Despite the growing interest of the scientific community regarding the impacts deriving from this type of contaminants, a study that deepens the problem in this way has never been conducted until now.

In fact, there are many analyses and studies that focus mainly on demonstrating the effects that derive from the ingestion or absorption of microplastics by marine organisms (Lusher 2015).

However, it is necessary to specify that the approach used does not allow to demonstrate with absolute certainty the level of risk associated with this type of impact but provides useful information on potential effects. For a more in-depth analysis of environmental risk assessment in the oceans, it is appropriate to use tests that can verify the relationship between the level of concentration and the response of the marine environment (Van Cauwenberghe 2015; Koelmans et al. 2017).

In the recent study by Grachev V. et al. (2018) "New Methods of Assessing Damage from Environmental Pollution", it is considered a new approach for the economic assessment of environmental damage, compared to the past, which simultaneously takes into consideration factors economic and assimilation.

In the work of Novoselova et al. (2016) with the use of the theory of fuzzy through the triangular numbers, an economic simulation of the accumulated damage is performed with the aim of responding to a wide variety of tasks related to management in the field of protection for environmental and ecological rehabilitation in a region.

Another issue examined for the environmental risk assessment is certainly that of the food sector. Brock et al. (2018), through a working group of the Scientific Committee of the European Food Safety Authority (EFSA), have developed a reference framework, which can

provide indications for carrying out recovery and resilience operations in agricultural landscapes, through evaluations of the environmental risk.

One of the tasks of the ESFA is to carry out the environmental risk assessments of regulated products for the production of food and feed (pesticides, genetically modified organisms (GMOs), additives), as well as assessments for all the exotic species that are harmful to the health of plants.

In order to carry out potential environmental risk assessments within the context of the European Union, it is necessary to develop various environmental scenarios, useful for defining the instruments of effects analysis (EFSA PPR 2014; Rico et al. 2017).

The approach that is followed in this work is of a systemic nature and makes it possible to reinforce and complete the integration of the various ecosystem services (ES).

The ES allow to have units, environmental factors and their relative responses to the associated stress factors, so as to be able to analyze the dependence that is generated in the context of ecological recovery and resilience.

This type of systemic approach has already been used by EFSA to draft recent documents of regulated products (pesticides, GMOs or for the protection of endangered species), and it was applied both landscape scale and local scale (EFSA PPR 2015, 2018; EFSA GMO 2015; EFSA SC 2016).

A further theme found in the context of the literature review, concerns the obstacles that are generated in the communication processes of environmental risks that analysts have to face.

Coleman and Zalk (2014), propose a model for this purpose that can be used as a tool for response and control, which can be used for environmental problems characterized by the same level of risk.

The model has been structured so as to be easily integrated into a work safety and health management system and uses multidisciplinary control strategies in risk analysis.

In this work an Environmental Risk Matrix (ERM) is proposed and presents a language similar to that foreseen for the Occupational Health and Safety Management Systems (OHSMS).

The environmental risk matrix is divided into four levels of risk (RL): levels can vary from RL1 with which the lowest level of risk is indicated, up to RL4 which associates the highest level of risk.

As shown in Fig. 5.1. the matrix combines the different scales of danger of the consequences on the environment (left column) with the level of probability.

Severity (Consequence to the Environment)	PROBABILITY			
	Extremely Unlikely (P1)	Less Likely (P2)	Likely (P3)	Extremely Likely (P4)
Long-term damage (reportable)	RL3	RL3	RL4	RL4
Short-term damage (reportable)	RL2	RL2	RL3	RL4
Short-term damage (non-reportable)	RL1	RL1	RL2	RL3
Minimal damage/Nuisance/Not immediately reportable event	RL1	RL1	RL1	RL2

Fig. 5.1 Environmental risk matrix—ERM (*Source* Coleman and Zalk, *Environmental risk communication through qualitative risk assessment* ([2014]))

The relative levels of RL risk are defined by the intersection between the two variables.

The method considered, allows to define the probability of environmental risk based on the level of risk severity or the effects produced on the environment.

This is an environmental risk matrix through a control banding (CB) approach to the environmental level that can be performed jointly with a Risk Level Based Management System (RLBMS) that is used for safety, hygiene and health on the work (Zalk et al. 2010).

CB is defined as a methodology that carries out a qualitative risk assessment trying to identify the wounds and illnesses related to work, in order to be able to minimize them (Zalk and Nelson 2008; Zalk 2010).

The inclusion of the environmental variable in the RLBMS model provides a useful and indispensable support for the management systems, based on the models proposed by the OHSAS 18001 and ISO 14001 standards.

The model proposed by the authors, although it requires further investigation, especially regarding its components, has proved to be of great use in industrial hygiene applications.

The ERM can be used for decision-making strategies, as it allows the risk assessment to be conducted at multiple levels.

5.4 Methodology

Based on what is defined in the work of Dwayne R. J. Moore and Steven M. Bartell (2000), it is possible to affirm that the estimation of the risks caused by the anthropic activities is carried out through the use of advanced methods.

These methods require a thorough knowledge of the available techniques and an important amount of data. For this reason, it is useful to avoid using them for assessments of environmental risks that do not cause particular concern but to use them to assess the effects that would have on the decisions that are incorrect and that require effective risk management actions.

The assessment of environmental risks is an important topic for evaluators who must make management and policy decisions, and it is a very complex process to manage because it requires to bear economic costs for data collection and to take into account, during the process of analysis of the complexity of the ecological system, as this assessment includes multiple stress factors that act simultaneously on the environment.

It is important to underline that these evaluations are mainly developed on the basis of uncertainty analysis and ecological models.

The two themes are particularly sensitive. The origins of uncertainties, if they are underestimated, lead to significant problems and do not allow proper action decisions to be taken.

Ecological models, on the other hand, represent the only way to consider the effects that derive from multiple stress factors that, by their nature, interact with each other on different space/time levels (for example, some resources can suffer the effects that derive so much from local and regional contamination as to the effects to be attributed to global warming).

Therefore, when an environmental risk assessment is carried out, all these elements must be taken into account. In such a context it is clear that a large amount of data is needed and the interactive, direct and indirect effects that arise when multiple stressors change at the same time must also be taken into account.

These problems demonstrate the complexity of risk assessments and since it is impossible to estimate the single impact of each stress factor, it is useful to perform an evaluation of those receptors that have characteristics of greater sensitivity and with the highest risk of exposure.

Such a procedure must be carried out upstream of the evaluation process in a gradual and iterative way so as to allow to clearly and immediately delineate the level of the possible risk scenario.

The iteration process is a method that allows you to check the risk levels of the different scenarios resulting, so as to eliminate those that have a non-significant risk level and therefore have a minor or no chance of causing environmental damage. In this way it is possible to analyze

with greater attention the scenarios that present combinations of multiple stressors with strong and significant environmental impacts and for which immediate action and management actions are required.

As already widely discussed, the assessment of environmental risk is largely influenced by the multiplicity of multiple stressors that can create uncertainty in the assessment. In order to carry out a correct evaluation it is not possible not to take into account the level of risk uncertainty: most of the methods that estimate and quantify the evaluation of multiple stressors are essentially of a probabilistic nature.

The process that is generally followed consists of 7 steps as shown in Table 5.1 and then outlined.

When it is decided to carry out an uncertainty analysis, the first step to be addressed concerns the specification of the risk model equation.

This equation allows to define the combination of inputs for the estimation of exposure, effects and risk (if this is present). The main objective of a risk equation for the evaluation of multiple stresses is to clearly define how stress factors combine and take on a more complex connotation than that of individual stressors.

This is mainly due to the interactions that can occur between the factors causing different types of impacts. The model equation can take several variations: from very simple to complex.

Table 5.1 Process to carry out an uncertainty analysis

Analysis level	*Description*
1. Equation of the risk model	Definition of the model equation
2. Variables as distributions	List of all the variables that are referred to as distributions
3. Density function for each input variable	A distribution is generated for each input in the model equation
4. Evaluation of the correlations between input variables	Consider the dependencies between the input variables of the model equation
5. Combination of output distribution and input distribution	Its needs to generate the output distribution combined with the input distribution as specified in the model equation
6. Optimization	Performed by sensitivity analysis
7. Analysis of the results	Highlight the relevant implications for the model

Source Personal elaboration of the author based on Moore D. R. J. and Bartell S. M., *Estimating Ecological risks of multiple stressors: Advanced methods and difficult issues* (2000)

In the second step of definition of the analysis, it is necessary to specify in a list the distributions of all the variables used and which have a significant influence on the final output. The list of distributions so organized must be as concise as possible (Seiler and Alvarez 1996).

Afterwards it is necessary to have, for each input variable present in the equation of the model, a distribution, that is a function of probability density. In the context of this step the choice of distribution is necessary. This choice is subject to two conditions: first of all, it is necessary to know the form of the observed data, obtained through statistical techniques or from forms of adaptation. The second condition concerns the basic knowledge of the input variable, used to describe the underlying reality.

The fourth step is certainly the most delicate as it tends to be notoriously underestimated and concerns the correlation between the input variables. At this level of analysis, there could be problems of over estimation or underestimation in the risk assessment, due to the failure to take into account the existing dependence between the variables (Seiler and Alvarez 1996).

Once the correlation between the variables is ascertained, the input distribution is set, based on the model equation, such that the relative output distribution is generated. The possible methods that can be used to carry out this fifth step for the definition of an analysis of uncertainty are numerous, but the analysis of Monte Carlo remains the preferred one.

In the sixth step of the analysis of uncertainty, through a sensitivity analysis, the importance of input variables is verified thanks to the optimization process. In particular, the most important correlations between input and output variables are identified. This step of optimization of the analysis is typically iterative and allows to verify the scientific validity of the variables. In fact, in the event that these do not have to be sufficiently suitable for the prefixed purpose, it is necessary to collect further empirical data that allow to repeat the analysis using new variables that define a new model equation.

The seventh and last step to be carried out to correctly conduct an analysis of uncertainty, concerns the exposure of the results. These must be represented in a clear and concise manner, such that the effects deriving from risk management can clearly emerge.

The techniques that can be used for this purpose are numerous, both graphic and statistical, but must be appropriately chosen, depending on

the type of output resulting. In the choice of the representation of the results, it is absolutely necessary to take into consideration also the recipients of the results and their level of statistical knowledge, so that it is possible to read them clearly.

The methods that are generally applied to perform multiple-factor evaluation are taxa-sensitivity distributions and the Monte Carlo analysis or simulation.

Taxa-sensitivity distribution is an approach developed by Parkhurst et al. (1996) and a request to formulate a distribution on intensity, concentration or stress dose and a distribution on environmental exposure.

The analysis allows to highlight only the sensitivity of the species to the risk but does not allow to quantify the level of uncertainty that comes from a non-adaptation of the model or from the estimate of toxicity end-points.

The percentage of the taxa involved is represented as a joint distribution.

The associated risk is defined by a curve that shows the probabilities of the effects for various entities. The approach adopted is of an additive type, in the sense that it is possible to assume that the risk associated with individual stressors are integrated with each other, so as to obtain cumulative risks.

For this purpose, it is necessary that the risks related to the single stress factors have a common scale of measure, so that risk curves can be realized that allow a better visualization of the results in support of the decision strategies to be taken.

There are some downsides deriving from the application of this method, such as the assumption of simplistic assumptions that can be made upstream of the assessment, making sure that some sources of uncertainty are overlooked. However, taxa-sensitivity distribution has the undisputed advantage of being easy to use and obtaining results that are easily understandable to stakeholders. It also allows to determine which stress factors and receptors require quantitative analyses of more in-depth uncertainty.

When an estimate on the uncertainty of environmental risk assessment is to be made, the Monte Carlo method or simulation is mostly applied. This is because, for the evaluation of multiple stresses that consider complex ecological models, this is the most viable calculation method. In fact, it has clear advantages in terms of ease of understanding of results,

simplicity in the use of calculation software and allows the incorporation of complex modelling systems between them.

The logic underlying the Monte Carlo simulation foresees that probability distributions are used instead of point estimates, then the samples are randomly taken from each distribution and finally the results are evaluated as a probability density function or as a cumulative distribution.

Among the disadvantages related to the use of the Monte Carlo technique is the large amount of data that must be used for a correct specification of the model equation, the distribution of inputs and the relationship between the distributions of the inputs themselves. If it is not possible to obtain empirical data, it will be necessary to conduct an analysis based on a model of elicitation.

On the basis of the latter approach, of Bayesian types, it is necessary to consider the probability as representative and based on existing information, rather than on the actual frequency with which an event occurs.

Those outlined are the most common ways in which the assessment of uncertainty is dealt with through the use of multiple stressors. In fact, in the literature there are other methods, above all probabilistic, that can be used in such evaluations and that allow to calculate and quantify the level of uncertainty such as the analysis of the probability limits and the Bayes' theorem.

When deciding to carry out an uncertainty analysis, there are many variables that need to be taken into account such as the complexity of the risk, the type and amount of information available and the skills of the person performing the analysis. One way to try to minimize impacts on uncertainties may be to minimize the impact of estimates on the final risk assessment.

As already highlighted above, assessments on environmental risks are based not only on uncertainty analysis but also on ecological models.

Ecological models have characteristics of complexity, dynamism and adaptability and are based mainly on mathematical models. In order to estimate risk assessment fairly effectively, economic models can be applied jointly with experiments and monitoring models.

The step that requires greater accuracy in the formulation of the model for risk assessment, concerns the ecological structure examined. This complexity derives mainly from the fact that for the modelling of an ecological structure influenced by a certain type of stress factor, it can be different from that required for other stress factors. In order to reduce

these complexities, it is useful to make explicit the possible correlations to two or more stress factors.

The existing methods used to define the model equations and describe the possible ecological scenarios on the basis of the different stress factors vary according to a purely empirical analysis of the data to the postulation of formulations deriving from the similarity of the phenomena already analyzed.

5.5 Conclusion and Limitations

From the work of literature review, it has clearly emerged that the cases and types of calculation that are used to carry out an environmental risk assessment are manifold.

However, nowadays there is not yet a framework that can clearly define in a standardized way the ways in which the tools that can provide an a priori and objective assessment of environmental risk management can be applied in a homogeneous way.

What emerged from the literature review shows that a methodology for communicating environmental risk stakeholders that can be associated with certain production activities is not fully developed. The problem of communication plays a central and absolutely fundamental role, as it is the passage through which the detection and analysis of risk can be avoided through the correct management actions from decision-making.

The communication between analysts who are experts in the evaluation and the decision-makers about the hazard and severity of the risk must be clear and univocal so that the correct actions can be taken to avoid the occurrence of damage.

As already mentioned above, the environmental risk management must therefore be part of the organizational strategies of companies, which in this regard must have adequate technical assessment and hazard analysis tools. The adoption of these tools and a production approach based on continuous monitoring and the perspective of life cycle management, is essential for companies wishing to operate with a view to full sustainability and also to avoid incurring penalties due to non-compliance with requirements required by environmental standards. In fact, environmental legislation is continually subject to continuous changes, also due to greater awareness and awareness of public opinion. For this reason, companies must put into practice control and prevention actions, and must be able to predict the possible consequences that their

products and production activities can have on the environment. In this sense, therefore, all monitoring and control activities are addressed that vary according to the activity performed.

However, the interaction that exists between a process activity and the environment, and the existence of mutual interconnection that exists between ecosystems, determines a strong complexity to structure an analysis that can define all the variables that must be included in the formulation of an evaluation model. For example, in a general model of LCIA further improvements are necessary that make the applicability of the LCA method in the environmental damage assessment.

Some calculation methods, such as the TEV method, detect a part of the real economic impact of environmental damage. In fact, when addressing the issue of environmental risk, it is not possible to carry out the maximum value of damage a priori. If this occurs, the company must internalize the costs of the negative externalities produced on the environment and on the company and must take into account any negative economic consequences that are found by a loss of image between its customers and consumers. Furthermore, it may also be necessary to consider the costs associated with a possible production interruption, reclamation and rehabilitation of the places and costs associated with possible damage to employees and/or third parties involved. In addition, there may be costs associated with administrative sanctions and penal problems attributable to management.

5.6 Further Steps

Despite the significant number of scientific contributions concerning ERA, a homogeneous methodology is still not clear.

The possibility to create a standardized method for environmental risk assessment should be developed starting from those that currently exist and which are outlined in the various fields of application.

Models integration is an operation that requires multidisciplinary and multisectoral skills such as chemistry, statistics, economics, medicine, ethics, etc., to cover all the phases of realization of a model characterized by analysis, evaluation and risk management activities.

In this sense, it is therefore necessary that a methodology be developed at the same time that is able to communicate clearly and unambiguously all the parties involved in the business process. The certification system is among the tools available to companies to support the management of the environmental risk assessment.

Table 5.2 Table of abbreviations

CB	Control Banding
CSR	Corporate Social Responsibility
DALY	Disability-Adjusted Life Year
EFSA	European Food Safety Authority
EPA	Environmental Protection Agency
ERA	Environmental Risk Assessment
ERM	Environmental Risk Matrix
ES	Ecosystem Services
GMO	Genetically Modified Organism
IPA	Impact Pathways Approach
LCA	Life Cycle Assessment
LCIA	Life Cycle Impact Assessment
LLE	Loss of Life Expectancy
OECD	Organisation for Economic Co-operation and Development
OHSMS	Occupational Health and Safety Management Systems
RL	Risk Level
RLBMS	Risk Level Based Management System
TEV	Total Economic Value
VOLY	Value of a Life Year
VSL	Value of Statistical Life
WTP	Willingness To Pay

The voluntary adhesion and verification by an independent third party guarantee the regularity of the legal obligations in environmental matters and demonstrate the company's real commitment to sustainability practices, as it provides to equip or implement the management tools environmental standards required by voluntary environmental regulations such as the EMAS Regulation, the UNI EN ISO 14001 standard and the ECOLABEL mark on the environment of consumer products. Equipped with these tools, companies have the opportunity to develop strategies and business organizations that support actions to make safety, prevention, protection and control.

There should be routine and extraordinary maintenance, according to the logic of continuous monitoring and implementation of environmental objectives.

Furthermore, in the assessment of environmental damage, social variables should be taken into consideration, since the occurrence of the damage implies negative impacts also and above all to the relative communities of reference. For this reason, companies, as well as focusing on the economic and environmental aspects of their work, should take into

account the potential impacts that derive from their activity through a full functionality of corporate social responsibility (CSR) (Table 5.2).

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CHAPTER 6

Environmental Risk Management (ERM) Through a Kaleidoscope Theoretical Approach

Maurizio Cisi, Laura Corazza and Ilaria Ciliberti

6.1 Introduction

Risk management is the "coordinated activities to direct and control an organization with regard to risk" (ISO 2009), defining risk as the "effect of uncertainty on objectives" and it is used to tackle different areas from financial to the environmental perspective.[1] There are several different examples which can represent an environmental risk, from Hurricane Katrina to more recent and closer examples, like the several earthquakes shaking the central part of Italy, situations beyond control that have

[1] ISO 3001:2018.

M. Cisi (✉) · L. Corazza
Department of Management, University of Torino, Turin, Italy
e-mail: maurizio.cisi@unito.it

L. Corazza
e-mail: laura.corazza@unito.it

I. Ciliberti
University of Torino, Turin, Italy

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become an important topic to tackle making it vital for companies to put them in agenda. This has also become very important to the United Nations, which through the Sustainable Development Goals (SDGs) have included environmental risk on their agenda, for example, Goal 6 which is for clean water, Goal 11 for sustainable cities and communities or Goal 13 for climate action, making it an issue for most, if not all, the companies.

When speaking of Environmental Risk Management (ERM), it is important to mention that it uses a "multi-disciplinary approach, with input and expertise required from many fields; civil and chemical engineering, physics, life sciences, ecology, geology, hydrology, and statistics being some of them" (Muralikrishna and Manickam 2017). In the business context, it is necessary to have knowledge in the field of business, particularly regarding corporate governance and leadership.

This paper examines, under the lenses the ERM, how different theoretical approaches upfront this topic, in the context of business reality. Its main aim is to create a systematic literature review on ERM seen through the lenses of the different theories of management, to elucidate their intersections and differences, alongside creating a study to aid the widespread of knowledge

The texts from which the research has started are:

- Fiedler's "The Contingency Model of Leadership Effectiveness" (1964) and his later paper "The Contingency Model and the Dynamics of the Leadership Process" (1978) which is a little less theoretical describing—a little more the practical side of the model, also proposing a new approach to it.
- Williamson's "Corporate Governance" (1984) paper which describes a first theoretical approach to the concept of owner–manager relationship, its impact on the firm and all the parts involved in it (later described as "stakeholders"). A later interpretation of this text was given in Freeman and Evan's "Corporate Governance: A Stakeholder Interpretation" (1990) which critically analysed Williamson's work.
- Schuman's paper "Managing Legitimacy: Strategic and Institutional Approaches" (1995) is probably the most recent collection and synthesis of the literature on legitimacy in the organisational dimension. It analyses and highlights its utility in the strategic and institutional field, alongside with the effective ways to adapt strategies.

– Jensen's "Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure" (1976) was the starting point for the research on the Agency Theory, it is then followed by other works of the author like "The Distribution of Power Among Corporate Managers, Shareholders and Directors" (Jensen 1988).

The ERM is analysed primarily with a purely theoretical approach on risk management, finding the justification for the practical norms of the ISO 3001:2018 and for the ERM the ISO 14001 (2015) family.

The remainder of the paper is organised as follows. The next section reviews the literature on leadership theories, corporate theories and ERM. Section 6.3 presents the collection of data regarding studies made on the theories and ERM. The final section concludes and discusses some implications.

6.2 Understanding the Theories

This section analyses the leadership and corporate governance theories. It is important to note that, especially in the last decade, more and more studies have been done to identify different schemes of organisation within the firm reality. These are both under a more general leadership point of view, which then is adapted to the business world and more business related corporate governance models or theories. The main identified theories for the purpose of this article are the contingency theory, the legitimacy and the stakeholder theory and finally the agency theory (Fig. 6.1).

The Contingency theory is a leadership theory adapted on Fidler's Contingency Model, which main idea is: "effectiveness in interacting groups or organizations depends, or is contingent, upon the appropriate match between leader personality attributes, reflecting his or her motivational structure, and the degree to which the leaders has situational control and influence" (Fiedler 1978). It then identifies two different types of leaders "task-motivated" and "relationship-motivated", the first performing better with high or low control and the second a moderate level of control and influence. As the Contingency Theory is based on traits, there are two parameters taken into consideration: "motivational structure" and "situ".

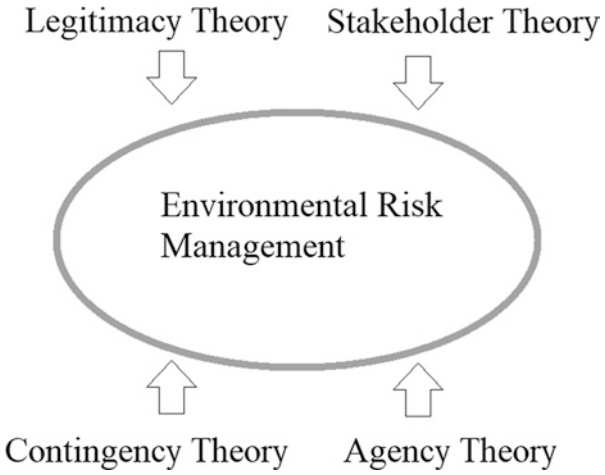

Fig. 6.1 How the different management theories fall into Environmental Risk Management

The motivational structure, which is how the leaders have motivated themselves and consequentially how they appear to others, is measured through a set of 18 opposite character attributes to identify the least preferred co-worker (or LPC). According to Fiedler an individual with a low LPC is classified as a "task-motivated", where the opposite is for the "relationship-motivated". The results obtained are not certain, as a leaders' behaviour does not depend only on their motivation, the control and influence are also dependent upon the situation. This is represented by situational control that is, in fact, the degree of control and influence a situation allows the leader to have. Contingency per se means that the actions are dependent on the uncertainty of a situation. Therefore, it is not only important to know the motivational drivers of the leaders but also the level of influence and control they would have on different occasions. In Fiedler's model, the uncertainty is how the group reacts to the leader's influence and control. A high degree of these traits on the group corresponds to a high certainty that the desired goals are achieved because the actions and decisions taken by the leader would be predictable. As a consequence, the group would be satisfied with their leader. Situational control in Fiedler's model is measured with three subscales:

- The first is "Leader-Member Relations": this measures the level of support and loyalty the leader has within his group.
- The second is "Task Structure". This dimension shows that leaders with more explicit tasks and specified procedures are preferred to others, allowing the task to be reached more positively than in other situations.
- The third is the "Position Power", defines the ability of the leaders to reward and punish, sanction or enforce the compliance on their group.

Beside this leadership theory, the "legitimacy" theory has been considered. According to Schuman (1995), the legitimacy is a "generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions". For instance, it has been observed that organisations acquiring legitimacy by conforming to institutional expectations often have better access to resources than illegitimate firms and are often insulated from scrutiny because by adopting institutional norms, firms reduce inspection by both internal and external constituents (Bansal and Clelland 2004). In other words, firms earn environmental legitimacy when their performance concerning the natural environment conforms to stakeholders' expectations so that their corporate environmental performance is desirable, proper, or appropriate.

Legitimacy theory suggests that management can influence the perception which the public has of the firm. Therefore, legitimacy implies that being legitimate, to a large extent, is controllable by the company itself (O'Donovan 2002). So, the legitimacy can be "managed" by the company changing its activities so that is consistent with social perceptions through to attempts to influence processes which may cause a change in social perceptions or values. Moreover, the nature of legitimacy makes it very difficult to discover the mechanism by which the organisations are motivated to disclose social and environmental information voluntarily. The organisation often associates the symbolic representation of its image with its culture and considers that to attain the legitimacy it is necessary only to improve its culture and to promote it in the external environment (Burlea and Popa 2013).

Stakeholders are identified as those who have a stake in the firm, from employees to managers, to consumers and suppliers, owners and communities (Williamson 1984). Moreover, within this system, there must be a clear

distinction between those who interact with the organisation (employees, customers, suppliers etc.) and those who share the risk (the owners). The Stakeholder theory (Freeman and Reed 1983; Freeman 1984; Donaldson and Preston 1995; Freeman et al. 2010) is another corporate governance theory that identifies that there are issues between the owners, defined as the shareholders, and the control parties, being the managers (Williamson 1984). However, the drivers of the actions and desires are also dictated by the other stakeholders and their interests, not only of these two parts as in other models, like the Agency theory. It has been stated, for instance, that the main impetus driving the development of sustainability reporting derives the stakeholder initiatives (Islam and Kokubu 2018).

The Agency theory often called the Stewardship theory (Davis et al. 1997) may also be known as the theory containing the "Principal–Agent Model" is the most recent adapted theory. The studies have started in the late 1970s and have been revised in the early 2000s by Jensen and other scholars. In this model the "Agency theory assumes that there is a contractual relationship and therefore the two contracting parties, one party can be described as principal, director, supervisor and the other side an agent thus subordinate" (Boučková 2015). The main issue of this theory is that considering the idea of one doing its best interest, not always the Principal's and the Agent's objectives are in the same direction, considering that the Principal is the risk-bearing part as is the one providing the capital. On the other hand, the Agent is at stake as they must achieve what the Principal has asked, acting in favour of the Principal (Boučková 2015).

The principal and the agents are considered rational economic persons motivated by self-interest, which may vary depending on preference, conviction and information, and this affects the relationship: the behaviour of the agents and his desire to maximise their utility which may not be consistent with the objectives of the principal. That's why the agency theory is characterised by moral hazard and adverse selection in a context of information asymmetry. The separation between ownership and management may lead to situations of risks growth due to the non-control of the behaviours in which the agent do not act in the interest of the principal and starts behaving opportunistically, operating frauds, working with incompetence or with indifference.

Both the Agency and the Stakeholder theory deal with the trade-off of the objectives between the parts; in one the stakeholders and the controlling parts, in the other the principal and the agent, which could still be owners (or shareholders) and managers.

The Legitimacy theory, unlike the previous two theories, is more oriented towards an ethical approach of the organisation, pushing the management to apply "sustainable governance", namely disclosing social and environmental information. On the other side, the Contingency Theory is mostly focused on the role of the leader and its impact or various dynamics rather than the dynamic per se. The model is more structured to evaluate the type of leadership and the drivers of the actions as the effectiveness of reaching the objectives, as a consequence limiting the uncertainty. Unlike the corporate governance theories, the Contingency theory tackles the issue of risk and uncertainty on the leader through the other drivers (task or relationship motivators).

In the theoretical contest described, an essential role of the ERM process is evident. This especially at an organisational level because the rational allocation of environmental risks prevention and control is an important management consideration (Sarfraz et al. 2018). ERM is therefore identified as the process of controlling, limiting and avoiding risks coming from environmental risks as having technical damages—such as oil spills, emissions or other environmental damages caused by the firm—but also environmental risk caused by natural causes which could potentially damage the company, i.e. floods or other natural disasters.

6.3 Methodology and Literature Review

In this section, an overview of the literature available on the different topics is presented. The search streams used are the main research engines, being Scopus, Science Direct and Google Scholar. To identify the best fitting papers to this research topic, a series of keywords to be inserted in the research engines. The keywords used are:

- "Contingency Theory" and "Environmental Risk Management"
- "Legitimacy Theory" or "Institutional Theory" and "Environmental Risk Management"
- "Stakeholder Theory" and "Environmental Risk Management"
- "Agency Theory" or "Stewardship Theory" and "Environmental Risk Management".

In Table 6.1, there is a summary of the results (presented in Annex 6.3) based on more than 100 articles considered from 2012 to 2018.

Table 6.1 Summary of collected number of papers

Theory	*Number of papers*
"Contingency Theory" and "Environmental Risk Management"	6
"Legitimacy Theory" or "Institutional Theory" and "Environmental Risk Management"	39
"Stakeholder Theory" and "Environmental Risk Management"	48
"Agency Theory" or "Stewardship Theory" and "Environmental Risk Management"	24

The first screening was done based upon the words matching the title or the abstract, then on the paper based on content analysis and taking into consideration the weight of the main management theories in the academic field, their primary aspects and how they serve to approach ERM. The results are shown in Table 6.2.

These results suggest a lack of literature specifically on the topic of ERM and the various leadership or corporate governance theories. The majority of the researched papers tackle the topic of ERM in general, most of which regard hazards regarding the environment rather than moral. There are also very few results from a managerial or organisational perspective. Also, the research on Google Scholar was clearly more proficient than on Scopus and Science Direct. At times the two would overlap (these have been excluded from the Google Scholar count), this is probably due to Google Scholar being a larger search engine compared to the other two, in fact, it apparently gave most results.

What appears clear is that has been a more considerable amount of researches on the topic of ERM and leadership or corporate governance theories. The Legitimacy and Stakeholder theories have undoubtedly been the most popular, growing exponentially during the past 6 years. Also, the contingency theory is either not considered too pertinent to the topic of ERM, or in the last 6 years, it has become less attractive due to the development of the other theories. What could also be important to note is that the Contingency theory falls under the "leadership" theories, whereas the other three are "corporate governance" theories, therefore easier to evaluate in empirical terms whereas the contingency theory may need a deeper analysis of the dynamics, in general. Regarding ERM the main analysed aspect is the governance rather than the leadership. However,

Table 6.2 Main management theories and authors

Theory	*Authors*
"Contingency Theory" and "Environmental Risk Management"	Xie (2012), Guenther and Hoppe (2014), Laguir and Elbaz (2014), Salvioni and Gennari (2016), Soundararajan et al. (2017), and Laguir et al. (2018)
"Legitimacy Theory" or "Institutional Theory" and "Environmental Risk Management"	Ali (2012), Amran et al. (2012), Bosire et al. (2012), Jo and Na (2012), Nandy and Lodh (2012), Rashed (2012), Lin (2013), Nikolaou et al. (2013), Dobler et al. (2014), Gibassier et al. (2014), Laguir and Elbaz (2014), Wildowicz-Giegiel (2014), Chapple et al. (2015), Dibia et al. (2015), Jain et al. (2015), Krasodomska et al. (2015), Leitoniene et al. (2015), Laidroo and Sokolova (2015), Ng et al. (2015), Rover et al. (2015), Chang (2016), Girisaballa and Bhattacharya (2016), Hawn and Ioannou (2016), Bouten et al. (2017), Cheong et al. (2017), Dahlmann and Ward-Grosvold (2017), Huang et al. (2017), Kumar et al. (2017), Mardiah et al. (2017), Soundararajan et al. (2017), Weber (2017), Yunis et al. (2017), Bose et al. (2018), Carè (2018), Cui et al. (2018), Dal Maso et al. (2018), Hu et al. (2018), Islam et al. (2018), and Laguir et al. (2018)
"Stakeholder Theory" and "Environmental Risk Management"	Ali (2012), Bosire et al. (2012), Nandy and Lodh (2012), Oikonomou et al. (2012), Bouslah et al. (2013), Choudhury et al. (2013), Nikolaou et al. (2013), Robertson et al. (2013), Allet (2014), Clark et al. (2014), Dobler et al. (2014), Gregory et al. (2014), Laguir and Elbaz (2014), Adhariani et al. (2015), Dibia et al. (2015), Laidroo and Sokolova (2015), Ng et al. (2015), Poplawska et al. (2015), Chang (2016), Hawn and Ioannou (2016), Khairollahi et al. (2016), Norgen et al. (2016), Metcalf et al. (2016), Severo et al. (2016), Abba (2017), Benlemlih and Girerd-Potin (2017), Cheong et al. (2017), Gond et al. (2017), Lin et al. (2017), Mynhardt et al. (2017), Plastun et al. (2017), Soundararajan et al. (2017), Breuer et al. (2018), Dal Maso et al. (2018), Dou et al. (2018), Easton and Pinder (2018), Ghadge et al. (2018), Hamidu et al. (2018), Iliya et al. (2018), Islam and Kokubu (2018), Jung et al. (2018), Laguir et al. (2018), Lam et al. (2018), Sarfraz et al. (2018), Sheikh (2018), Sodjahin et al. (2018), and Suto et al. (2018)

(continued)

Table 6.2 (continued)

Theory	*Authors*
"Agency Theory" or "Stewardship Theory" and "Environmental Risk Management"	Xu (2012), Bouslah et al. (2013), Robertson et al. (2013), Nikolaou et al. (2013), Dobler et al. (2014), Jung et al. (2014), Guenther and Hoppe (2014), Laguir and Elbaz (2014), Liu et al. (2014), Adhariani et al. (2015), Dibia et al. (2015), Rover et al. (2015), Boncori et al. (2016), Chang (2016), Darus et al. (2016), Jung et al. (2016), Salvioni and Gennari (2016), Benlemlih (2017), Mynhardt et al. (2017), Samet et al. (2017), Breuer et al. (2018), Laguir et al. (2018), Sodjahin et al. (2018), and Xu et al. (2018)

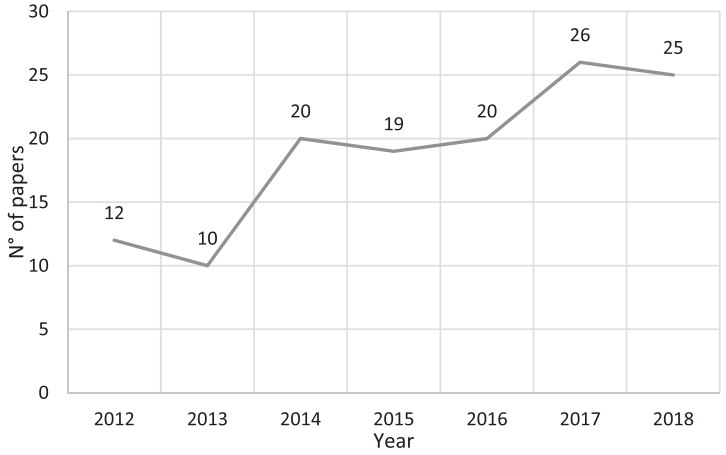

Fig. 6.2 Papers per year

Aragón-Correa and Sharma (2003) in "A Contingent Resource-Based View of Proactive Corporate Environmental Strategy" developed on the ideas of contingency theory, a theory of how external business environment of the firm determines the environmental strategy and the effects.

This table showing all the results by year clarifies the increasing interest in the correlated topics (Fig. 6.2).

What appears through all these papers is that the "environmental risk management" is not only seen in terms of ecological or human environment but the "environment" is seen as the "corporate environment". The best example is that "[The] corporate environment risk is organization's systematic risk of the whole enterprise under the sustainable environment, involves the inherent question of environment such as technical risk, the economical risk and external diseconomies risk" (Xie Kun 2012). Others do mention the ERM, but only as an argumentation on the evaluation of Environmental Accounting.

6.4 Conclusions

To conclude, from our analysis we can understand that in the past six years there has been an increase in literature including management theories and ERM. What is lacking is a full focus on ERM as most of the focus was towards environmental management rather than the risk, and that the environment was not only from an ecological point of view but as corporate environment. Also, in most of the literature, ERM was also used as a parameter to reach a conclusion on Environmental Accounting or CSR reporting rather than being the focus itself.

What did show from the results is that, due to its multidisciplinary aspects, the most adequate management theory to connect with ERM is, evidently, the stakeholder theory. This conclusion is demonstrated in Table 6.1. The second most frequent theory to connect with the topic is the legitimacy theory, which, alongside the alternative version, the institutional theory. The least applied theory is the contingency theory.

This paper's main aim was to take the literature on ERM and the different management theories, sectioning them and trying to see to what extent the management theories intersect when having to deal with ERM. This research is a starting point to proceed with a more in-depth analysis of the topic as there are no works specifically on ERM, as previously stated. It surely would be necessary to take into consideration not only the primary theories, but all the evolutions that the scholars have done on them to have a more comprehensive vision of the theories and their impacts.

One of the results of this paper is to put more and more focus on the debate around the various facets that the term environmental risk refers to. First, primordial theories do not include any notion of environmental risk, so the notion of natural capital is completely absent and

Annex 6.3 Number of papers per year depending for every keyword

Keywords	*Scopus*	*ScienceDirect*	*Google Scholar*
2012			
"Contingency Theory" and "Environmental Risk Management"	1	0	0
"Legitimacy Theory" or "Institutional Theory" and "Environmental Risk Management"	0	0	6
"Stakeholder Theory" and "Environmental Risk Management"	0	0	4
"Agency Theory" or "Stewardship Theory" and "Environmental Risk Management"	0	0	1
2013			
"Contingency Theory" and "Environmental Risk Management"	0	0	0
"Legitimacy Theory" or "Institutional Theory" and "Environmental Risk Management"	0	0	2
"Stakeholder Theory" and "Environmental Risk Management"	0	0	4
"Agency Theory" or "Stewardship Theory" and "Environmental Risk Management"	0	0	3
2014			
"Contingency Theory" and "Environmental Risk Management"	0	1	2
"Legitimacy Theory" or "Institutional Theory" and "Environmental Risk Management"	0	0	4
"Stakeholder Theory" and "Environmental Risk Management"	0	0	4
"Agency Theory" or "Stewardship Theory" and "Environmental Risk Management"	0	0	5
2015			
"Contingency Theory" and "Environmental Risk Management"	0	0	0
"Legitimacy Theory" or "Institutional Theory" and "Environmental Risk Management"	0	0	8
"Stakeholder Theory" and "Environmental Risk Management"	0	1	5
"Agency Theory" or "Stewardship Theory" and "Environmental Risk Management"	0	0	3

(continued)

Annex 6.3 (continued)

Keywords	*Scopus*	*ScienceDirect*	*Google Scholar*
2016			
"Contingency Theory" and "Environmental Risk Management"	0	0	1
"Legitimacy Theory" or "Institutional Theory" and "Environmental Risk Management"	0	0	3
"Stakeholder Theory" and "Environmental Risk Management"	0	0	5
"Agency Theory" or "Stewardship Theory" and "Environmental Risk Management"	1	0	5
2017			
"Contingency Theory" and "Environmental Risk Management"	0	0	1
"Legitimacy Theory" or "Institutional Theory" and "Environmental Risk Management"	1	0	9
"Stakeholder Theory" and "Environmental Risk Management"	0	0	6
"Agency Theory" or "Stewardship Theory" and "Environmental Risk Management"	0	2	1
2018			
"Contingency Theory" and "Environmental Risk Management"	0	0	1
"Legitimacy Theory" or "Institutional Theory" and "Environmental Risk Management"	0	0	7
"Stakeholder Theory" and "Environmental Risk Management"	0	2	12
"Agency Theory" or "Stewardship Theory" and "Environmental Risk Management"	0	1	3

not personified. Secondly, the perception of the risk related to the environment needs, perhaps, of other interpretative theories if the existents are not thought to be applied in this sense. Thirdly, financial markets and financial analysts themselves are working busily to help predict financial impacts (mostly negative) arising from an incorrect risk assessment.

In conclusion, the issue of identification, management, understanding of natural capital as a business risk must still be considerably explored, not only in terms of impacts. Although analysts and providers of capital are interested in impacts, future research will have to be done to understand whether companies have become aware through their operations to prevent and tackle those grand challenges, which often environmental hazards represent.

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PART II

Public Sector and Health Management

Track "Risk Management in the Public Sector and in Healthcare"

Part II introduces many interesting contributions on the risk management in public sector. The risk management is defined as "the activities of the identification, evaluation and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor and control the probability of unfortunate events to maximize the realization of opportunities" (Douglas, 2009). The standard ISO 31000 defines it as the effect of uncertainty on objectives.

Part II deals a research contribution on local government and well five research contributions on the risk management in healthcare due to this public sector needs an adequate risk management system in order to improve patient safety.

The research contribution on local government deals an important distorting factor in public administrations, the corruption. It strongly affects the public administration and correlated entities with high investments and high revenues, influencing also the work of managers and decision-makers. It needs an in-depth analysis of a new risk assessment tool to prevent corruption.

The research contributions on healthcare organizations deal with many factors due to the current challenges in this scenario. In fact, in the last decade, several world global agencies proposed innovative and

multidisciplinary practices to increase patient safety. For instance, in 2013 the Agency for Healthcare Research and Quality proposed a list of strongly recommended practices for patient safety. In 2015, the Italian Government defined the qualitative, structural, technological and quantitative standards related to hospital assistance and the guidelines to be followed for managing the risk. As highlighted to some research contributions in this part, clinical risk management is one of clinical governance interventions for quality improvement through a systematic process, including both the clinical-assistance and management dimension, which employs a set of methods, tools and actions that allow to identify, analyze, evaluate, process and monitor risks to improve the safety of patients and operators. Clinical Risk Management investigates the error and causes of the error, the processes mapping and the implementation of evidence-based practices. Clinical Risk Management is responsible to identify, prevent and manage the risk of error in the health sector, with the aim of improving the quality of health services and ensuring the safety of patients. However, the efficient adoption of risk management tools need the development of a new culture, to passing from the culture of guilt of medical error characterized by isolation, silence, defensive medicine to a culture of transparent error analysis, in search of organization critical points, to introduce corrective actions.

Part II explores the risk management through different research contributions under the headings of "Risk-Aware Business Process Management: A Case Study in Healthcare" (1), "Risk Management and Analytical Accounting Approach in Use of the HIV Rapid Tests in the Hospital: The Case of the Amedeo di Savoia" (2), "Priorities in Patient Safety: The Role of Clinical Risk Management" (3), "The Data Quality for Healthcare: The Risk Management Tools" (4), "How the Cartorisk Sham Method Can Boost Up the Risk Management in the Healthcare System of Piedmont?" (5) and "How Anti-Corruption Practices Boost Up Transparency and Performance Measurement Systems. Evidence from the City of Turin" (6). Each research contribution has its own methodology written in each section under the subheading "Methodology". The contents of each research contribution are as follows.

The first research contribution of this part is "Risk-Aware Business Process Management: A Case Study in Healthcare". This contribution introduces an innovative approach focused on the business process management perspective in the management of risk and compliance in the health sector. It proposes a methodological framework based

on modeling and simulation of business processes. This methodology has been applied to the blood bank department of a large hospital. The findings of this research highlight that a simulation-driven approach is an effective way to intercept and assess the real risks. Furthermore, the research underlines that this methodology can provide a useful support to decision making processes.

The second research contribution is "Risk Management and Analytical Accounting Approach in Use of the HIV Rapid Tests in the Hospital: The Case of the Amedeo Di Savoia". The study analyses the standard costs associated with each activity for the administration and management of rapid HIV tests, assessing their effectiveness and efficiency in terms of cost and sustainability based on the regional tariffs established in an Italian regional health system. It highlights that the rapid test can increase the effectiveness of the system and the diagnostic offer, however, involves a reduction in efficiency. It also highlights the need to manage the risk related to excessive costs with experimental tools that do not lead to an effective fallout within the hospital structure.

The third research contribution is "Priorities in Patient Safety: The Role of Clinical Risk Management". The research describes the implementation of the Clinical Risk Management System at the Città della Salute e della Scienza of Turin. It has been designed starting from the information collected by two main sources (scientific literature and regulations). These sources have allowed to design the Clinical Risk Management System according to some variables such as the claims for damages, sentinel events, adverse events and complaints. The findings also highlights the main areas for prior actions and implementation of corrective measures for patient safety.

The fourth research contribution is "The Data Quality for Healthcare: The Risk Management Tools". The research supports the creation of a service that advantage the dependencies and the territory through the data collection and reporting system for internal and external stakeholders. It analyses a specific tool, i.e., local plan for addictions (PLD), of an Italian regional about the risk management in the healthcare. This tool has been designed to encourage, for instance, the integration of public and private services. However, this tool highlights some problematic and challenging aspects. In this way, the authors propose new solutions and innovative ideas such as the use of the big data obtained by this tool.

The fifth research contribution is "How the Cartorisk Sham Method Can Boost Up the Risk Management in the Healthcare System of Piedmont?" This research analyses the risks connected to the services provided by some hospital units of an Italian region by the "Cartorisk" tool. This tool allows to maps the risks of the main health service supply processes, the barriers used to contain them, and the residual risk that has to be managed. After this mapping, it proposes specific activities to improve patient safety. Furthermore, the research highlights the main stakeholders in the risks connected to the services the services provided by some hospital units. The research also describes a useful instrument that can favor the availability of data, the identification of effective and efficient treatments and transparent administration of the service.

The sixth research contribution is "How Pioneering Managers Strive to Integrate Social Risk Management in Government Debt Collection". This research deals with the different approaches on risk management in an Italian local government. It describes the new control system of the Municipality of Turin that has been implemented for improving the transparency, anti-corruption and performances monitoring of its participated companies. As highlighted by authors, the corruption is one of the main distorting factor in the market and in public and private organizations. The research provides empirical evidences that the anti-corruption plan must be integrated in the corporate culture. Absolutely it must not be a simple compliance to the existing legislation.

CHAPTER 7

Risk-Aware Business Process Management: A Case Study in Healthcare

Ilaria Angela Amantea, Antonio Di Leva and Emilio Sulis

7.1 Introduction

Risk is part of every business activity and therefore part of every business process (Van der Aalst 2013; Hashmi et al. 2016). If a risk occurs it may cause loss of quality, increased costs, time delays, complaints and legal problems (Betz et al. 2011; Amantea et al. 2018) as well as, in healthcare, serious and permanent damages up to death. Thus, risks need to be managed by the applications of principles, frameworks and activities in the context of Risk Management (Sadgrove 2016; McNeil et al. 2015; Haimes 2015). Within a framework of continuous development, the

I. A. Amantea (✉) · A. Di Leva · E. Sulis
Computer Science Department, University of Turin, Turin, Italy
e-mail: amantea@di.unito.it

A. Di Leva
e-mail: dileva@di.unito.it

E. Sulis
e-mail: sulis@di.unito.it

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hospital management has to assess the risk management system regularly to ascertain whether the risk handling process achieved the desired goals.

The discipline introduces a whole range of new regulation (Tomiyama et al. 2009; DeRosier et al. 2002; Blake and McTaggart 2016) facing two sets of problems: on one side the process has to be compliant to law; from the other side new reorganizations must be implemented with the introduction of new procedures (Hayes 2014), i.e. for privacy control.

Business process analysis is one of the most recent areas of organizational management (Di Leva 2014). In this context, the Business Process Management (BPM) discipline (Dumas et al. 2013) identifies the phases of Process Analysis, Process Reengineering, Process Automation and Process Monitoring (Di Leva and Sulis 2017b). One of the main issue of BPM (Van der Aalst et al. 2010; Abo-Hamad and Arisha 2013; Dumas et al. 2013) is change management (Hayes 2014), as a valid methodology to analyze processes in a constantly evolving environment.

This research addresses the following questions:

- How to integrate modeling and compliance analysis to norms and regulations in order to better prevent risks in healthcare?
- Do computational simulation and scenario analysis help in such compliance analysis task?

Our case study refers to an Italian Hospital "Città della Salute e della Scienza di Torino". In particular, we selected a well-performing department (accordingly with the Risk Manager of the hospital) as the Blood Bank (BB). The department's laboratory performs tests necessary for production of blood components as well as for diagnostic, pretransfusion testing and prevention of hemolytic disease of the newborn. The compliance model is the starting point for the minimum requirements. This model satisfied the minimum level of checks to protect from legal risk. Our study demonstrates that it would also be a very streamlined process, even if allowing the possibility to not detect the same amount of errors. For this reason, and to solve this problem, a large amount of corrective actions has been carried out by workers in the current real model. Actually, the process is very efficient in detecting errors even if it suffers from a lack of staff (which would imply higher costs), mainly involved in repetitive manual checks that implies increasing of time. Restructuring the process with an only one centralize information system and scanning documents will maintain the efficiency of the system in the detection of

errors, streamlining the process in terms of number of tasks, staff, timing and consequently costs. Furthermore, current process Failure Mode and Effect Analysis (FMEA) analysis reveals that the causes with greater risk index are precisely those which would be torn down thanks to the new type of process. In the next section, we describe the related work, while Sect. 7.3 introduces our methodological framework. Section 7.4 treats the case study which includes modeling, compliance and business process analysis. At the end, Sect. 7.5 will show the conclusions.

7.2 Literature Review

In the health field there are many benefits of organizational vision for processes (Testi et al. 2017). The natural application of this approach concerns the care pathways, of a clinical or care nature, modeled starting from the needs of the patients. In this direction, the diagnostic therapeutic assistance (PDTA) recently introduced on the basis of *the clinical pathways* (Lawal et al. 2016; Schrijvers et al. 2012), as interventions based on the treatment and oriented in particular to the clinical, organizational and economic impact. In this way, one of the main problems in the management of the company concerns the analysis of risks related to business processes and the compliance of these processes with current rules and regulations (Dumas et al. 2013). Often, both environmental changes and regulatory innovations force companies to redesign their business processes in the context of change management (Hayes 2014).

In healthcare, studies on business process analysis are relevant for the direct and indirect consequences of errors (Vincent et al. 2000; Chartier 2014). It is possible to find several studies on compliance with laws, rules or regulations in the case of processes related to patient health (Buddle et al. 2005; Racz et al. 2010; Vincent 2017).

The most common approach to the issue focuses on the detection of failures, mostly dealing with bad performance departments, stressing enforcement styles (Parker and Nielsen 2011) as well as reconsidering project implementations (Hornstein 2015). Following a different strategy from the common business analysis (Chang 2016), we applied an approach oriented towards the understanding of cases of success, as a way to address other departments of the same organization in process optimization. The adoption of BPM, so the process-centric approach relying on a process-aware information system (Dumas et al. 2005)

allows the redesign of business processes in an organization and to analysis of risks related to a business process and the compliance of the process to norms, regulations or laws (Van der Aalst 2013).

A simulation-driven approach is a versatile tool to produce results that are relatively easy to interpret by comparing different scenarios to evaluate process changes (What-if analysis). A scenario can be considered as a description of a possible future situation. It is not a complete description of the future, but rather a way to consider the basic elements of a possible future and to draw analysts' attention to the key factors that can help to effectively improve the actual process (As-Is model) (Di Leva and Sulis 2017a). The process map is specified with the BPMN language (BPMN 2014) while the simulation is based on a powerful discrete event simulator (Fishman 2013) integrated in iGrafx Process (iGrafx 2015).

Regarding risk assessment, two types of risks will be considered in healthcare: clinical and legal risks.

The **clinical risk** concerns the occurrence of errors in medicine, i.e. insufficiencies of the care system that conditions the success of the actions planned for the patient's health. The risk can therefore be seen as the probability that a patient is the victim of an adverse event, i.e. suffers any "damage or discomfort imputable, even if unintentionally, to medical care provided during the period of hospitalization, which causes an extension of the period of hospitalization, deterioration of health conditions or death" (Duffy and Lightner 2017). The adverse event is, by its nature, undesirable, unintentional, potentially harmful to the patient and therefore must be "preventable". For the purpose of identifying the preventive measures to be implemented, it is of great importance not only to analyze the adverse events, but also "near miss" (Ministero della Salute 2008).

Clinical risk management initiatives include a set of guidelines, protocols, procedures, organizational and clinical practices to be adopted in the hospital to reduce the likelihood of events likely to produce adverse effects not only on patient health, but also for staff and visitors (Coviello and Di Trapani 2015).

The methods and tools of risk management can be varied. Among the methods used in the absence of adverse events there is FMEA (Chiozza and Ponzetti 2009); these techniques are based on the systematic analysis of data collected in the past to introduce in the processes of the

activities that prevent, as far as possible, the occurrence of unwanted events again.

Other methods include techniques for analyzing adverse events that occur, such as cause and effect analysis (Herringbone diagram) (Nicolini et al. 2011). This method allows operators and organizations to trace the causes that contribute to an adverse event and offers the possibility of developing effective recommendations for the implementation of actions to improve the system.

The **legal risk** in the hospital concerns the conformity of the procedures adopted to the provisions of the laws and regulations in force. Failure to adhere to these rules may result in judicial and/or administrative sanctions, financial losses and damage to the hospital's reputation that are difficult to remedy. The legal risk can be characterized by the probability of occurrence and the consequences on users. Therefore, it is necessary to activate a context that facilitates risk management by providing organizational processes to implement, monitor and improve compliance audits throughout the organization, keeping in mind the evolution of laws and perplexities in terms of how they are actually applied laws themselves.

7.3 Methodological Framework

The Risk-aware Business Process Management (RBPM) methodology based on a conscious management of risks and compliance consists of four phases:

- **Context Analysis and Compliance Verification**—this phase aims: (a) to fix the overall strategic scenario of the enterprise, (b) to determine the organizational components that are related to the process under analysis and (c) to collect the laws and regulations related to the process and analyze them in order to identify which controls are mandatory or simply suggested.
- **Process Engineering**—the initial purpose of this phase is the determination of the activities performed in the functions involved in the process and the causal relationships existing between them. The process is then reconstructed from facts external to the system, events and objects in input/output: this provides the Process diagram that will be specified using the Business Process Model and Notation (BPMN) language (BPMN 2014). The process model must therefore be validated with the stakeholders involved in the

process, using animation and simulation of its BPMN specification, obtaining the so called As-Is model.
– **Compliance Checking and Risk Analysis**—the purpose of this phase is to verify the compliance of the current process to underline which rules and controls must be present in the new optimized process. Therefore, in the risk analysis phase the possible causes of error must be analyzed to decide which corrective actions must be introduced.

In particular, in hospitals the Clinical Risk Management (CRM) includes processes, methods, tools and activities used in handling risks in patient care to increase the safety of patients and those involved in their care and the procedure for handling risk and consists of:

- *Risk identification*: to perform the identification of risks, the hospital's managers can take into account notifications from reporting errors (usually stored into an incident reporting database), such as events that caused problems to patients and complaints. Even results of inspections and audits can provide useful indications.
- *Risk analysis*: the goal of this step is to determine the causes of risks and factors that favor errors as well as their effects on the safety of patients.
- *Risk assessment*: decision-makers must determine what kind of risks should be treated with priority.
- *Risk treatment*: a risk can be treated by introducing preventive measures and/or accepting risk with or without supervision.

– **Reengineering Process**—this phase aims to create a new optimized version of the As-Is model, the To-Be model that includes the necessary rules and corrective actions as well as other restructuring actions such as, for example, the digitization of paper forms.

7.4 The Blood Bank Case Study

The processes that take place in the BB are designed to safely select and assign the blood bags (units) to the patients before the transfusion, and therefore include the analysis of the patient's blood, the typing of the units and the compatibility tests in order to assign.

The analysis of the BB was carried out by a Working Group that includes doctors, biologists, technicians, nurses, administrative staff as

well as process analysts (who have verified and validated every process that we will show later).

The BB includes three functional units: Acceptance, Laboratory and Distribution.

Acceptances are received requests from other hospital departments (for example, from the emergency room), from other hospitals or clinics in the Piedmont Region. Staff verifies the correspondence of the data reported on the request and the test tube and in case of discrepancy or doubt a new sample is required. The request and the tube are then sent to the laboratory where a series of tests are performed. Finally, if blood components are required, the Distribution takes care of withdrawing them from the cash register and sending them to the requesting department through the staff in charge.

In the RBPM methodology, the process diagram is integrated with a description of the way in which each activity is carried out, how long it takes and what resources are needed to perform it. Furthermore, it is necessary to specify how requests are introduced into the model and for how long the simulation must last. In particular, the generator that corresponds to the initial arrival event in the As-Is model (Fig. 7.2) introduces about 350 requests a day, for a total of about 86,000 requests received from the BB in the first 8 months of 2017.

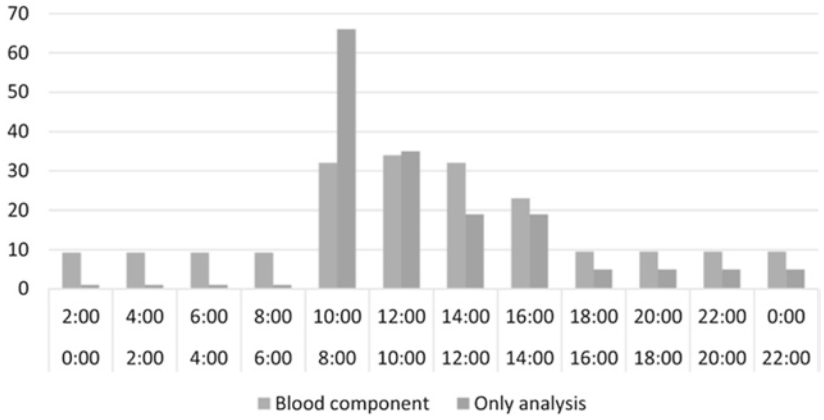

Fig. 7.1 The Blood Bank daily workload

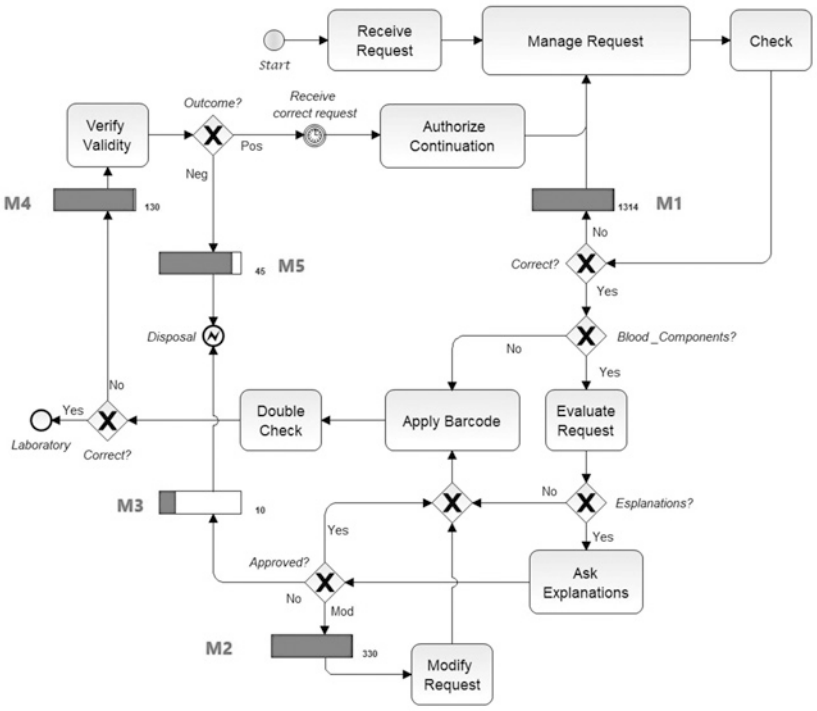

Fig. 7.2 Acceptance sub-process (As-Is model)

In the article, it was decided to discuss only the Acceptance sub-process for reasons of space, but the same analysis was performed for all three sub-processes (Acceptance, Laboratory and Distribution) and some overall results will be provided.

Figure 7.2 illustrates the sub-process currently applied in Acceptance. The RBPMTool is a tool that allows putting in the simulation, after the controls, the counters—monitor M1, M2, M3, M4 and M5—which count all the transactions (in our case the requests) that correspond to errors.

As shown, the requests (a test tube and a paper request) are received (*Receive Request*) by a nurse, an administrative staff adds the request (*Manage Request*) in the Local Management Information System (LMIS), a second administrative staff makes some general checks (*Check*)

and, if no errors are found, applies an identifying barcode on the paper request and the test tube (*Apply Barcode*). At this point, the request is further checked to ensure the correctness of the barcodes (*Double Check, Verify validity*) on the request and the test tube. Since the "decision to transfuse" is a critical step for the patient's safety in his care path (unnecessary transfusions are common), if blood components are required the BB doctor evaluates the request with the requesting department about adequacy of the request (*Evaluate Request, Ask explanation*) and, if necessary, refuse it. If all these controls are positive, the request with the test tube is sent to the Laboratory (event *Laboratory*), otherwise, the request is rejected (event *Disposal*). The M1–M5 counters are positioned on the process to count the number of errors intercepted during simulation at different control points.

Simulating the As-Is process with the same workload as above, we obtain a total number of intercepted errors equal to 1829 (sum of all monitors). This number must be compared with the number of errors reported in the BB database during the same period.

Table 7.1 illustrates, for each cause of error, the number of errors reported (Err) and the number of complaints reported (Com) in the LMIS database.

Comparing the sum of the errors of Fig. 7.2 and the sum of errors in Table 7.1 we notice that about 62% of errors are detected but

Table 7.1 Reported errors: detected errors and complaints for each causes of errors

Type	*Causes*	*Err*	*Com*
Internal	Incomplete data	134	–
	Switching errors	20	–
	Insert errors	349	10
	Other	8	–
	Total	511	10
Check	Cross check missing	14	–
	Signature check missing	31	–
	Doctor check missing	82	–
	Total	127	–
Inappropriate request	Data: inappropriate/reconsidered	16	–
	Quantity: inappropriate/reconsidered	26	–
	Urgency: inappropriate/reconsidered	21	–
	Total	63	–

Table 7.2 Reported and detected errors and complaints

	Reported	*Detected*	*Complaints*
Acceptance	701	1829	10
Laboratory	111	700	4
Distribution	78	400	12
Whole BB	890	2929	26

not reported. Similar results were found also in the Laboratory and Distribution (Table 7.2).

The Table provides the starting point for two important conclusions:

- The BB staff has a poor attitude for reporting errors as they are discovered in the process. This is partly due to the workload that at certain times of the day is particularly heavy. The consequence of this fact is that the management of the BB has little information about the actual causes of errors. As a result, improvement initiatives clearly suffer from this deficiency.
- The Complaints column shows that the number of errors not detected in the BB process is very low, this indicates that the current process is very efficient.

In any case, as the consequences of certain errors can be very serious, the need to improve the process is always present and an FMEA analysis is under way to address the most dangerous cases.

Table 7.1 is the starting point to analyze risks of each causes of errors using FMEA technique (Table 7.3). Three scores are assigned to each cause (between 1 and 10):

- **Severity (S)** shows the severity of the effects eventually happening. It can range from 1 (very moderate problems) to 10 (death).
- **Occurrence (O)** estimates the frequency with which an effect will occur. May vary from 1 (unlikely to occur) to 10 (almost certain to occur).
- **Detection (D)** refers to the possibility of the operators and the control measures to detect error before the effects occur. It can range from 1 (the system will always detect error) to 10 (detection is not possible).

Table 7.3 FMEA matrix of acceptance sub-process

Causes	*S*	*O*	*D*	*RPN*
Incomplete data	5	2	2	20
Switching errors	7	1	1	7
Insert errors	5	2	5	50
Other	1	1	1	1
Internal				
Cross check missing	7	1	1	7
Signature check missing	3	1	1	3
Doctor check missing	5	1	2	10
Check				
Data: inappropriate/reconsidered	7	1	1	7
Quantity: inappropriate/reconsidered	7	1	1	7
Urgency: inappropriate/reconsidered	7	1	1	7
Inappropriate Request				

The scores S, O and D were estimated with the Working Group and validated with the analysis of the detailed data for a limited number of days.

To calculate the **Risk Priority Number (RPN)** the three scores were multiplied (each RPN index has a range between 1 and 1000).

Looking at the FMEA matrix (Table 7.3), the most relevant RPN indices were highlighted:

- (F1) *Incomplete data* and (F3) *Insert error*: concerns errors made by the staff in entering the patient and the request data in the LMIS,
- (F7) *Doctor check missing*: concerns the lack of final doctor's control.

The causes of error (F3) and (F4) will be taken into consideration in the following optimization phase.

The efficiency of the BB processes is the result of continuous improvement initiatives, the so-called corrective actions. The starting point must be the model containing the controls and actions required by law. In the Acceptance process, the Italian law only imposes to check that the surname, name and date of birth of the patient reported on the request are the same as reported on the test tube (Fig. 7.3).

Therefore, at the arrival of the request (*Receive Request*) if a blood component is required, it is assigned by the BB doctor (*Assign Blood*

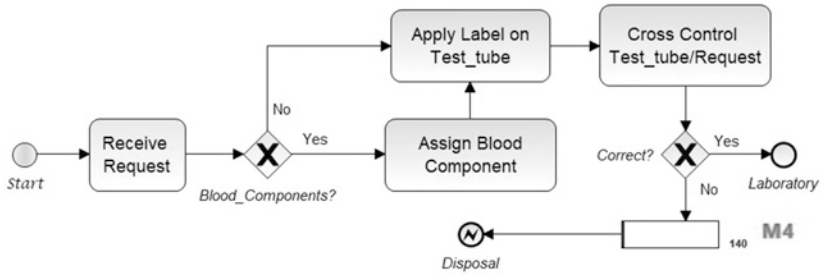

Fig. 7.3 Acceptance sub-process (Compliance model)

Component). In both cases, a label identification is applied on the test tube (*Apply Label on Test tube*) and then the data on the request and the test tube is checked (*Cross Control Test tube/Request*). If no errors are detected (*Correct?* gateway) the request and the test tube are sent to the Laboratory, otherwise (monitor M4) the request is disposed. As Fig. 7.3 clearly describes, only a limited number (140) of errors would be detected in this Compliant sub-process (the simulation of the two versions of the sub-process was performed under the same conditions).

Comparing the number of errors detected by this model with those of the current As-Is model (1829), it can be noted that about 92% of the errors would not be detected. Table 7.4 shows the results obtained for the whole BB process if only the mandatory controls were implemented. In this Table, the columns As-Is Current, Compliance and Lost, respectively, represent the errors detected in the current and the compliant processes, and the percentage of lost errors without corrective action implemented by staff in the actual process.

The results clearly indicate that the only controls required by law are absolutely insufficient or, conversely, the additional corrective actions

Table 7.4 Comparison between As-Is and compliance models

	As-Is	*Compliance*	*Lost (%)*
Acceptance	1829	140	92
Laboratory	700	53	92
Distribution	400	43	89
Whole BB	2929	236	92

implemented by the BB lead the process to a considerably higher level of effectiveness. Currently, all patient records and requests arrive on paper and must be reintroduced manually in the local management system. This is the reason for the multiple controls in Acceptance. Furthermore, the FMEA emphasizes that the major risks (F1) and (F3), derive precisely from the problems involved in entering data into the local management system. A new web-based version of the LMIS management system, currently under development, has been proposed to address these problems.

The actual local system will be integrated with the central management system of the hospital and developing the following requirements:

- The requesting department prepares the label with the patient's data and the barcode, places it on the test tube and loads, with the same barcode, the request (which will be dematerialized) on the central system;
- In Acceptance's department the test tube arrives and, through the barcode, with the new local system the request is retrieved (the control will therefore be much faster).

The new scenario was discussed with the Working Group and the candidate To-Be model was modeled producing the diagram in Fig. 7.4, which is very simplified.

The optimization mainly concerns the Acceptance sub-process. In fact, the integration of local and general management systems involves the introduction of patient and request data only once, avoiding rewriting errors and eliminating the need for controls. The digitalization therefore allows to remove the causes of error (F3) and (F4) detected with the FMEA analysis, so errors in Acceptance would be reduced from 1829 to 508. But mainly, observing a set of critical indicators, an increase in efficiency and effectiveness can be noted.

The simulation report (Table 7.5) shows that the digitalization of the request and the integration of hospital and BB management systems leads to a drastic reduction of the disposal request and of the average cycle, work and waiting time.

The reduction in the number of errors and the processing times obtainable through digitalization is particularly relevant at peak hours of the workload (h.8-12, as shown in Fig. 7.2). Mainly, in case of urgent and very urgent requests in which it is required a rapid delivery of blood:

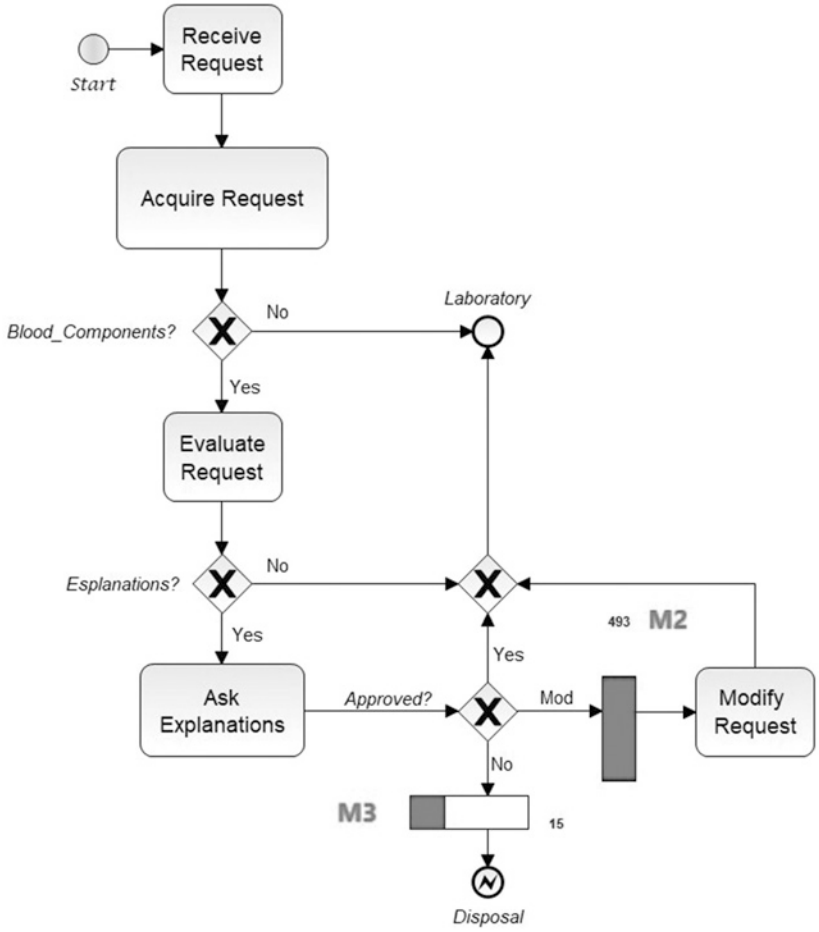

Fig. 7.4 Acceptance sub-process (To-Be model)

Table 7.5 Comparison between As-Is and To-Be models

	As-Is	*To-Be*
Total request in input	86,160	86,160
Disposal request	58	25
Average cycle time (min)	35.22	2.61
Average work time (min)	5.46	2.20
Average waiting time (min)	29.75	0.41

between 15 and 20 minutes for very urgent requests, within 1 hour for urgent requests.

7.5 Conclusions and Future Works

This article describes an approach, based on the RBPM framework, to design and reason about the organization of a company.

The framework includes a methodology for modeling, validating and analyzing a business process and an extended process model that provides the possibility of simulating the behavior of the existing process (As-Is) and analyzing scenarios that describe the possible evolution of the process, allowing to build a new restructured version (To-Be).

During the restructuring phase, it is possible to take into consideration the risks that may arise during the execution and the suggestions derived from the verification of the conformity of the processes to the laws and regulations in force.

In this way, managers can obtain useful indications regarding the restructuring actions to be undertaken, not only to improve the efficiency and effectiveness of their organization but also to adapt it to the new needs that arise in the real world.

One development to be pursued concerns the application to the present case of methods for agent simulation (instead of discrete events as described above) (Sulis and Di Leva 2017). Agent-based models allow us to reproduce the behavior of individuals who inhabit the environment we intend to simulate, including resources (environment) and interaction rules (Boero et al. 2015).

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CHAPTER 8

Risk Management and Analytical Accounting Approach in Use of the HIV Rapid Tests in the Hospital: The Case of the Amedeo di Savoia

Valerio Brescia, Vania Tradori, Maha Radwan and Fabrizio Bert

8.1 Introduction

It is estimated that in Italy, similarly to other European countries, there is a substantial proportion of people infected with HIV who are not aware of their HIV status (about a third). However, it has been shown that about 30% of diagnoses of HIV infection are carried out in people who are already in advanced disease (CD4 < 200/mmc lymphocytes and/or AIDS-related diseases) and in any case almost 60% AIDS

V. Brescia (✉) · V. Tradori · M. Radwan
Department of Management, University of Turin, Turin, Italy
e-mail: valerio.brescia@unito.it

V. Tradori
e-mail: vania.tradori@unito.it

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diagnoses are made in people with late recognition of HIV infection. This phenomenon determines several negative consequences (Bert et al. 2018a). Firstly, the late-diagnosed person with HIV does not have the opportunity to start antiretroviral therapy within the optimal time frame and has, on the one hand, a higher risk of reaching a full-blown phase of the disease and, on the other hand, a reduced probability of full immunological recovery once the pharmacological treatment has begun (Biancone et al. 2018c).

Secondly, the lack of awareness of the state of infection can promote further spread of the infection. Indeed, it has been shown that people with HIV infection partially or completely reduce the risk of transmission of the infection once they have been informed of their condition. Furthermore, there is evidence of the effectiveness of the prevention of the spread of the infection addressed to people with known HIV infection. Thirdly, antiretroviral therapy, reducing viral load can also help limit the spread of the infection. Indeed, a person aware of their own serological state that takes an effective therapy has a very reduced risk of transmitting the infection to others. Finally, pregnant women aware of having HIV infection can access maternal-fetal prophylaxis programs that drastically reduce the transmission of the virus to the unborn child.

In view of the high number of HIV-positive people who are still unaware of their serological status, it is considered strategic, primary and urgent to activate early identification actions able to allow an early detection of these people. The study starts from the analysis of the Italian and Regional epidemiological situation and highlights the organizational elements linked to the service of AIDS prevention, especially regarding the HIV test offer (Tradori et al. 2017; Biancone et al. 2018b). The objective of the analysis is to identify the standard costs associated with each activity for the administration and management of rapid HIV tests, and to assess their effectiveness and efficiency in terms of cost and sustainability based on the regional tariffs established by the Piedmont regional health system.

M. Radwan
e-mail: maha.radwan@unito.it

F. Bert
Department of Public Health Sciences, University of Turin, Turin, Italy
e-mail: fabrizio.bert@unito.it

8.2 Organization of the Service in Piedmont Region

Regional Health Service (RHS) structures that offer the HIV test must ensure: the gratuitousness of the service, the direct access and the anonymity to all the people who request it and provide adequate procedures to maximize the confidentiality of the outcome and information on the person who requires the test.

Moreover, RHS structures that offer the HIV test must guarantee directly, or indirectly through the connection with specialized centers, appropriate diagnostic procedures, prevention activities, treatment and care, facilitating prompt management in the event of positivity. The implementation of prevention interventions that provides for the rapid test in strategic contexts is indicated in order to increase the early diagnosis and reach the people that use the health services with difficulty. The active offer of the rapid HIV test promoted by organizations operating outside RHS (associations, third sector), must involve specialist clinical centers (infectious diseases, STD—Sexually Transmitted Diseases centers) of Piedmont Regional Health Authority. In particular, protocols and procedures relating to the following aspects must be prepared: training of personnel involved in the test offer, communication of the results of the test, sending of the positive results to the centers of infectious diseases for the confirmation of the result (validation of the invalid and positive results) and the management, disposal of biohazardous health waste. All RHS practitioners who come into contact with people who have sexual behavior at high risk of HIV infection should systematically propose the HIV test. All people who apply to regional TSI centers must be actively and systematically offered the HIV test. The HIV test must be actively offered to all persons who have suffered sexual violence according to the criteria, timing and modalities of the protocols for the provision of post-exposure prophylaxis. The HIV test must be actively and systematically offered to all people:

- who have made or even occasionally use injective and non-injective drugs;
- that are in charge of Public Services for Addictions, or Drug Addiction Service;
- that originate from countries with high HIV endemic (prevalence > 1%—reference to the UNAIDS estimates) at the first opportunity in which they turn to RHS structures or to services dedicated

to the protection of their health, regardless of the reported risk behaviors;
- presenting symptoms suggestive of acute HIV infection;
- presenting diseases included in the definition of AIDS or associated with HIV infection (the test offer in these cases is strongly recommended and must be systematic); and
- presenting a condition or pathology whose management may be influenced by knowledge of the HIV serological status.

The HIV test must be offered also to all pre-conceptional women, at the time of pregnancy and subsequently during gestation if exposure to risk occurs (the test offer in these cases is strongly recommended and must be systematic).

The HIV test must be offered to the partners of pregnant women or who intend to start pregnancy. The test offer in these cases is strongly recommended and must be systematic. Healthcare personnel assisting women in childbirth should check that the HIV test has been performed during pregnancy. If this has not happened, the emergency procedure must be offered in order to be able to make the appropriate decisions on the prophylaxis measures to be implemented, including the procedures for carrying out the childbirth. The HIV test is mandatory for all blood or blood component donors, organs, tissues and cells. The HIV test must be systematically offered to all persons with accidental percutaneous exposure (cutting, tip injuries, mucosal contamination and/or non-intact skin), to potentially infectious material according to the criteria, timing and modalities foreseen by the protocols for post-exposure to HIV prophylaxis.

The 4th-generation immunometric tests (I level test) are the tests of choice indicated for the diagnosis of HIV infection in particular for cases of suspected acute or recent infection and if the test is performed for organ donation and of blood components. Moreover, the release of newer 4.5-generation rapid tests consented to reach a specificity and a positive predictive value of about 100% (Bert et al. 2018b). Immunometric tests that look for both antibodies against HIV 1 and HIV 2 and that are sensitive to the subgroup or HIV 1 must be used. Positive or doubtful results at I level tests should always be confirmed by Western Blot/Immunoblotting (II level or confirmatory test) and/or HIV RNA. If the results of the serological tests are not conclusive, the research of HIV RNA is decisive that can be carried out at the reference

laboratories. Laboratories carrying out anti-HIV serological tests should preferentially work on a mother test tube, include internal quality control within each session and participate in an external quality assessment program (VEQ) on a regional, national or international basis.

Regarding the interpretation of the result and reporting of the serological test for HIV antibodies:

- The negative result of the first level immunometric test (screening) indicates the absence of HIV infection if performed 3 months after the last exposure potentially at risk;
- In case of reactivity of the first level immunometric test, the Western Blot and/or HIV RNA confirmation test (II level test) must always be performed;
- In the case of discordant results (test I reagent level/western blot/immunoblot negative or undetermined) the HIV RNA execution is indicated by sending the sample to the reference laboratories. In the case of suspected acute HIV infection, the test of choice is HIV RNA ("window" phase);
- The report must include the result of the test as "positive"/"reactive" or "negative"/"non-reactive" together with information on the method used to perform the tests (elisa, chemiluminescence, etc.);
- Reporting of a "positive"/"reactive" result should only be performed after confirmation of the result on the first level immunometric test with the western blot/immunoblotting and/or HIV RNA confirmation test;
- Test reporting times should normally be within one week; and
- Each positive/reactive report for HIV must be delivered exclusively to the person to whom the examination refers to, with post-test counseling and contact with the Infectious Diseases Centre for patient delivery.

Concerning the rapid tests for anti-HIV antibodies:

- The operator (health and otherwise), appropriately trained, who offers the rapid HIV test must perform the assessment of the risk of acquiring the infection of the person undergoing the test;
- The result of the rapid HIV test must be communicated verbally during an interview and must be contextualized on the basis of the

assessment of the risk of acquiring the HIV infection of the person undergoing the test. When the person has reported dubious exposures in the three months prior to the execution of the test, the operator must propose sending the person to a center of infectious diseases and possibly repeat the test 3 months after the last exposure;
- The positivity of a rapid test must always be confirmed with other reference methods, according to the procedural algorithms foreseen for the conventional screening test (1st level);
- The reactive result of the test can be interpreted as "preliminary positive", but always requires the execution of a confirmation test on the blood sample and the taking charge of the person by the center of infectious diseases.[1]

8.3 Methodology and Case Study

The aim of the study is to analyze the use of rapid HIV tests in the hospital context in terms of cost efficiency and future sustainability. In the analysis conducted, an objective qualitative analysis approach is applied using a case study of the Amedeo di Savoia Hospital to highlight the functioning of the methodological approach on analytical accounting. In the analysis, particular attention will also be paid to the technical characteristics of the tests by the pilot project conducted in the hospital. In order to carry out our analysis, the case study method was adopted (Yin 1994). The data were collected through internal presence and data recording, an interview with the service manager Prof. Dr. Giancarlo Orofino and analysis of the accounting documentation.

The Amedeo di Savoia Hospital District, considered its centennial activity, represents a regional reference point for the diagnosis and treatment of infectious diseases. It is indeed the most important hospital in Piedmont Region able to respond to the health and welfare requests of the subjects affected by AIDS and its laboratories guarantee analyses of unique complexity in Piedmont (Italy) (Fig. 8.1).

The microbiology and virology laboratory is the reference center of Piedmont Region for virological surveillance of the InfluNet network, registered at the European Centre for Disease Control (ECDC) in Stockholm. The laboratory performs tests for the diagnosis and

[1] HIV testing policies in piedmont 2016, prepared by the Health Department, 2016.

Fig. 8.1 Amedeo di Savoia Hospital. The Palazzina of the management and administrative offices seen from inside the hospital complex, 1930 (*Source* www.museotorino.it/view/s/e6a78325ac0141808e134adb7b39bae4, August 28, 2017)

management of infectious diseases through highly specialized molecular biology techniques. The laboratory uses the most advanced techniques of molecular diagnostics, such as quantitative assays using real-time "Polymerase Chain Reaction", sequence analysis and mutational studies for the genetic variability of viruses and for the evaluation of drug resistance.

An example of an experimental project on rapid HIV and syphilis tests, active in the area in collaboration with the Amedeo di Savoia Hospital, was concluded in 2017 (Tradori et al. 2017) in collaboration with the Association Odv Casa Arcobaleno, the analysis linked to rapid tests in terms of cost and effectiveness has not yet been conducted at the intra-hospital level.

The hospital unit uses the conventional blood test that has always been present in national contexts. The test used is the Elecsys HIV combi PT Gen of Roche and allows detection of both the HIV antigen and specific antibodies. This leads to improved sensitivity and a shorter diagnostic window than tests that detect only HIV antibodies.

Fig. 8.2 OraQuick ADVANCE® HIV-1/2 rapid antibody test kit controls (*Source* www.meridianbioscience.eu/oraquick-em-advance-em-reg-rapid-hiv-1-2-antibody-test-kit-controls.html, August 30, 2017)

The duration of the test is 27 minutes and the high clinical specificity reduces the need to repeat the tests. The disadvantage of this type of test is the time taken both for the duration of the sample itself, and then for the analysis times. On average the results are obtained in a week, the Amedeo di Savoia Hospital is the only exception in Italy that, in some cases, allows to obtain the results in the day to increase the efficacy related to the transmission of the result and the start of possible therapies (Kassler et al. 1997) or an immediately activation of an antiretroviral therapy (Koenig et al. 2017).

8.3.1 Rapid Tests

The structure mainly uses three types of rapid tests for HIV. All types provide exclusive use by previously trained health professionals, the presence of a doctor is not mandatory but strongly recommended. The rapid tests used by the hospital are among the most widespread in population testing projects (Biancone et al. 2018c).

The rapid tests used by the hospital are as shown in Fig. 8.2.

8.3.2 The OraQuick Advance HIV 1/2 Rapid Test

The OraQuick Advance rapid test is a third-generation visual reading test for the determination of anti-HIV 1 and anti-HIV 2 antibodies marketed in Italy and in Europe by Meridian.

It has a sensitivity of 99.6% and a specificity of 100%. The complete test kit includes the test device, a vial containing the reaction development solution, a swab and a test carrier. The device for performing the test is provided with a flat swab placed at one end, and a reading window of the test result. The test is performed on an oral fluid sample and gives the result in 20–40 minutes. The oral fluid sample is obtained by placing the device on the outside of the gingiva (between the gum and the inside of the lip) and sliding it along the gingiva of the entire dental arch, both upper and lower. Once the enclosure containing the device has been opened, the operator provides the identification code on the device, shows the user the procedure for taking the oral fluid sample and assists it during the sample collection phase. After taking the oral fluid, the user introduces the device into the vial containing the test development solution, housed in the test base (supplied in the kit). The test is performed under the supervision of the health worker. If the sample of oral fluid taken contains anti-HIV antibodies, an immunochloride reaction is determined which produces the appearance of a purple-reddish line in the test reading window (T zone). The appearance of two lines in the test reading window, one in the control area C and the other in the test area T, indicates that the test is reactive. The appearance of the single control line indicates a negative result of the test. If, on the other hand, no line or only one line appears in the T-zone of the test, the test is considered invalid and must be repeated.[2] The unit cost related to the rapid response test kit was requested from the manufacturer and corresponds to €10.00 to 22% VAT excluded (Fig. 8.3).

8.3.3 The VIKIA HIV 1/2 Rapid Test

The VIKIA HIV 1/2 rapid test is a third-generation visual reading test for the detection of HIV-1 and HIV-2 antibodies on serum, plasma and whole blood, marketed in Italy and Europe by BioMérieux. It has a sensitivity of 99.8% and a specificity of 99.9%. The test is performed on a sample of 75 μl of blood obtained by puncture of the fingertip and capillary sampling. Once the enclosure containing the device has been

[2] G. Ippolito. 2015. "Definition of operational scopes and tools and assessment of the economic impact of the HIV test offer outside established health contexts using rapid tests. Provide a technical basis for policy makers who must define operational strategies", in the Offer of the HIV Rapid Test in Unconventional Contexts, No. 1.0, pp. 45–46.

Fig. 8.3 OraQuick ADVANCE® HIV-1/2 rapid antibody test kit controls (*Source* www.biomerieux.it/prodotto/vikiar-hiv-12, August 30, 2017)

opened, the operator provides the identification code on the device. The device is provided with a special buffer where the sample of blood taken is applied to which a drop of buffer is added (supplied together with the device). The test gives the result in 30 minutes. If the blood sample taken contains anti-HIV antibodies, an immunochloride reaction is determined which produces the appearance of a purple-reddish line in the test reading window (T zone). The appearance of two lines in the test reading window, one in the control area C and the other in the test area T, indicates that the test is reactive. The appearance of the single control line indicates a negative result of the test. If, on the other hand, no line or only one line appears in the T-zone of the test, the test is considered invalid and must be repeated. The unit cost of the rapid response test kit was requested from the manufacturer and corresponds to €3.80 excluding 22% VAT.

8.3.4 The Alere HIV Combo Rapid Test

The Alere HIV Combo rapid test is a fourth-generation visual reading test for the detection of HIV-1 and HIV-2 whole blood antibodies, marketed in Italy and Europe by Alere (Fig. 8.4). It has a sensitivity of 100% and a specificity of 99.7%. The test is performed on a sample of 50 μl of blood obtained by puncture of the fingertip and capillary sampling. Once the enclosure containing the device has been opened, the operator provides the identification code on the device. The device is provided with a special pump where the sample of blood drawn is channeled to

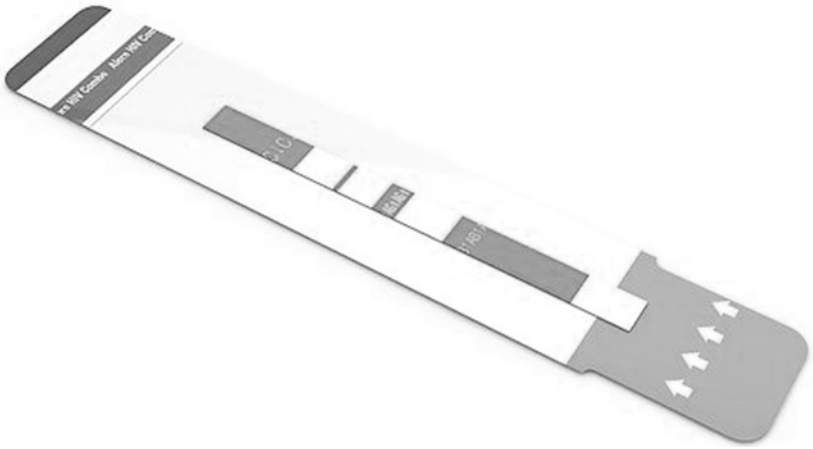

Fig. 8.4 Alere™ HIV combo (*Source* www.alere.com/en/home/product-details/alere-hiv-combo.html, August 31, 2017)

which, after having deposited it in the area predisposed to collecting the blood, a drop of buffer is added (supplied together with the device). The test gives the result in 20 minutes. If the blood sample taken contains anti-HIV antibodies, an immunochloride reaction is determined which produces the appearance of a red line in the test reading window (T zone). The appearance of two lines in the test reading window, one in the control area C and the other in the test area T, indicates that the test is reactive. The appearance of the single control line indicates a negative result of the test. If, on the other hand, no line or only one line appears in the T-zone of the test, the test is considered invalid and must be repeated. The unit cost related to the rapid response test kit was requested from the manufacturer and corresponds to €9.00 excluding 22% VAT.

8.4 Cost Analysis, Analytical Approach and Findings

Starting from the data collected, a model was computed for calculating the total costs of the service dedicated to the HIV test offer based on the analytical costs per test performed. It is possible to formulate two drivers of total costs: on the one hand the number of tests performed based on

analytical costs (Puddu 2011; Lusa et al. 2016; Puddu et al. 2017) which includes the cost of the test kit and consumables; on the other hand, the number of opening hours of the service that determines the standard costs (Abbafati and Spandonaro 2011; Brescia et al. 2016) of personnel and general expenses.

Health organizations have the distinction of not having a price system to measure the value of the output, are not subject to a system of competition on the market, they are not companies with the aim of having a profit and a majority of the public services companies do not risk failure. However, the regional classification system succeeds in assuming what are the costs attributable to the service through standards. Even if not present on the market, the outputs can still be compared with similar services between regions and with extra-hospital services based on community. The objectives of quantitative effectiveness (number of services provided) and qualitative (goodness of performance, performance indicators), or objectives of technical efficiency (system productivity) or economic objectives can be defined (cost of performance evaluable for standard costs) (Biancone et al. 2017). Through standard costs it is possible to evaluate the appropriateness of the intervention both a clinical level (necessary operation) that at the organizational level (resources used organizational modality). The "standard cost" is a defined cost based on an ex ante construction of the commitment that the production unit will have to sustain for the production cycle (Brusa 2000). This cost, in fact, is defined based on predefined levels of efficiency and price in relation to certain operating conditions in a specific period of time. To deepen the concept of standard cost it is necessary, first, to distinguish two types of costs:

- *Actual cost*: costs incurred to produce a good/service
- *Cost*: expected to be incurred in a given reference period in relation both to the operating and functional conditions in which the company operates, that of the actions that the organization intends to implement to achieve its objectives. In this context, the importance of the public administration is highlighted by the standard cost. It is a tool to control corporate efficiency and support for the determination of sales and supply prices.

The standard cost can be distinguished in ideal standards costs and practical standard costs. The ideal standard costs are defined costs in

consideration of an optimal level of technical-productive efficiency (where I would like to get) of the company or in its external economic relationships. Practical standard costs are costs determined through an analysis of the costs incurred by the company according to the levels of output that will be achieved (where I can get). With a view to improving the efficiency of the use of internal resources, the analysis of actual or forecast deviations, assumes a fundamental role for the control of the performances and address of the corrective policies for the achievement of the desired company. There are several advantages in using the standard cost instead of the actual cost. The standard cost is a basis for performance monitoring. The results of unity organizational, the cost of service provided, the performance of a manager can be measured in comparison with the standard cost. The standard cost provides a mediated cost against timely changes in the production process in materials, methods of delivery, performance of the service. For example, in a hospital ward there are professionals with different seniority and their salaries may be different. If they are engaged interchangeably on the same activity in the same department it has be assumed as an hourly cost for all those healthcare professionals the standard hourly cost. The standard cost greatly simplifies the registrations and surveys for the accounting: in the previous example, I do not have to acquire and trace the name of the professional who has worked and calculate the relative hourly cost based on different business cost of his salary. The hourly cost of the service in this analysis is the same for everyone. Often the standard cost is used because it would not be cost effective to detect the actual costs. The adoption of standard cost accounting takes place as an alternative to methods based on the historical cost of purchase. To update the unit cost of production centers on price of materials, the standard cost requires a comparison with other companies in the same sector in a given period of time, both for the producing company and for its own providers. An accounting based on the historical purchase cost is oriented to observing the trend of costs over time, rather than between different companies. A standard cost methodology puts the emphasis on the benchmark with other companies in the market and best practices, introduces the idea that cost is a variable factor to reduce if too much deviates from the market averages, beyond the fact that in the past the historical cost of purchase was calculated with respect to the previous expenditure, assuming the datum as established. The analysis is made innovative by the fact that a standard cost for rapid HIV testing activities within the hospital has

not yet been identified nationally. Furthermore, the currently parameterized reimbursement takes into account only the standard costs for routine diagnostic activities with ELISA blood test. Without considering the generic costs of structure it is possible to concentrate on two main costs:

- *Cost of the test*: for each test the unit cost of the kit has been obtained from the price lists of the manufacturers, while for consumables we mean the disposable materials used for the test as gloves and disinfectants.
- *Personnel costs*: hourly staff costs per professional figure derive from the National Collective Labor Contracts (CCNL) of the Non-executive Personal Health Section, area IV of the medical and veterinary management. The hourly cost has been calculated from the total annual cost including social security and insurance costs, in the case of 52 working weeks and a number of weekly working hours as per the respective CCNL. The total number of hours per person used for the test offer for each professional figure was determined by multiplying the number of hours of service opening by the number of units of each professional figure present in each session and then adding the values obtained for every session.

The unit costs and related parameters in question are shown in Tables 8.1 and 8.2.

In the case of rapid reactive test, the visit for the communication of the confirmation test result and for a first clinical evaluation is evaluated on the basis of standard times related to the activity of communication of the result by positive tests. The OraQuick Advance rapid test is the one most often used by the staff of Amedeo di Savoia Hospital for the convenience of the gingival swab. Practical evidence shows that patients prefer to avoid blood sampling or even just fingertips. From the data of Tables 8.1 and 8.2 it is possible to calculate what is actually the standard cost of the test for the Amedeo di Savoia Hospital. The doctor carries out the activity for 37 minutes, which at a cost of €34.70/h corresponds to €21.40. The nurse performs the activity for 9 minutes at a cost of 17.9 €/h, so for a value of 2.70 €. To these values we still have to add the unit cost of the test and kit (€10.0) and the unit cost of disposable materials (€1.5). Overall, therefore, the unit cost per test was estimated at €35.60. Personnel costs represent the main cost component, 65% of total costs, while the cost of consumables is equal to 35% of total costs. Both are

Table 8.1 Unit costs

Variable	*Base scenario value*	*Source*
Unit costs €		
Personnel—hourly cost per professional figure determined by the National Collective Labor Contract of the National Health Service personnel		
Doctor	34.7	Area IV medical and veterinary management
Nurse	17.9	Non-managerial staff
Other health worker	14.6	Non-managerial staff
Non-healthcare worker	14.0	Non-managerial staff
Test costs + test kit		
OraQuick Advance	10.0	Manufacturer's price list
Alere HIV combo	9.0	Manufacturer's price list
Vikia HIV 1/2 test	3.8	Manufacturer's price list
Single use test material	1.5	Estimate

Source Own realization

Table 8.2 Time division parameters for activities' execution

Activities' execution	*Minutes*
Nurse	
Pre-test counselling	7
Signed informed consent and identification code assignment	2
Doctor	
Sample collection and execution of rapid response tests	1
Compilation questionnaire risk assessment	6.3
Reading tests and filling in the work register	1.6
Communication test result if positive	24.8
Communication test result if negative	4.2

Source Own realization

variable costs related to the number of tests performed. In order to guarantee a control system that allows the economic, financial and equity balance it is necessary to set up a governance system that takes into account different characteristics based on big data quality (Biancone et al. 2018a). At the moment the computerization of the folders and the flows does not allow a systematization of the highlighted data.

To perform the analysis, it is necessary to take into account the Diagnosis Related Groups (DRG). The DRG is a method for classifying patients discharged from hospitals in Italy. The DRG/ROD system (Homogeneous Diagnosis groupings) is a classification system that is based on homogeneous groupings of diagnosis, an Italian translation of the US system known by the abbreviation DRG. It is a classification system for patients discharged from acute care hospitals, which is currently also used in Italy as a base for the financing of hospitals. This system is based on some information contained in the hospital discharge card (SDO) and identifies about 500 classes of cases, tendentially homogeneous as regards the consumption of resources, the length of hospital stays and, in part, the clinical profile. With the application of this system, a new method of financing hospital activities based on the remuneration of benefits through predetermined rates is introduced in the NHS. The predetermined rate reflects an estimate of the average cost of each hospitalization on the basis of which the hospital activity paid is remunerated. Each region has a nomenclator tariff updated annually which lists the health services and how much, for each of them, is recognized by the Region to which it belongs. As for our field of analysis, the Piedmont Region, with Executive Decree No. 240 of May 4, 2017, approved the annual update of the "Regional catalogue of outpatient specialist services". It provides for a recognition of €34.9 compared to the activity previously listed by Amedeo di Savoia Hospital, i.e. the test for the determination of antibodies to HIV 1 and anti-HIV 2.

8.5 Conclusion and Further Steps

Providing the rapid test alongside the test offered with laboratory analysis within the hospitals is an effective approach to increase the efficiency of the service. In particular in cases where an immediate response and direct access to the result is necessary, the use of the rapid test solves the problems of waiting for results obtained through laboratory tests which, according to current legislation, can not be communicated unless directly to the user. If the sensitivity and specificity of laboratory tests (Azzi et al. 2005, p. 137) is greater than the ones of rapid tests, the use of rapid tests greatly reduces the problems and limits of access to the diagnostic service, but this assessment should be linked to a pre-counseling process in order to guide the user based on the probable risk related to sexual behavior of having contracted other STD.

The laboratory test provides a 3-month window period that according to the literature can be reduced to 1 month while the rapid tests used have a window period of 3 months. It would be desirable for the future to adopt rapid fourth-generation tests in order to reduce the window period and compare the reactivity of tests (Kelvin et al. 2016; Maksut et al. 2016). The use of an approach based on analytical accounting and accounting based on standard costs shows how it is possible to compare the standard costs for diagnosis by the Regional Health System and the standard costs for the rapid HIV test. In our case study knowing that the test for the Amedeo Hospital of Savoia has a total cost of 35.6 € and that this type of performance involves a reimbursement of the Piedmont Region for 34.9 €, remain excluded 70 euro cents that must be subsidized or by public or private subjects. This involves a problem of defining a standard cost attributable to the diagnosis made with rapid HIV tests within each region. Currently, the diagnostic service is therefore not part of a rational accounting system, without laying the foundations for what is budget balance. It is necessary to take this into serious consideration in future years in the planning and control phases. The cost of the service does not significantly affect the changes in the budget so today the regional health system has not implemented the standard costs verifying the deviation. But it would be appropriate to include the survey system for all experimental projects widespread in the area. However, if the rapid test can increase the effectiveness of the system and the diagnostic offer, it will lead to a reduction in efficiency in terms of diagnostic costs. The methodology is applicable at national and international level. There are no similar studies in Italy. The future analysis can be conducted on the cost effectiveness of the offer in the hospital context by verifying economic and epidemiological data between rapid and ordinary test.

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CHAPTER 9

Priorities in Patient Safety: The Role of Clinical Risk Management

Teresa Capasso, G. Fornero, U. Fiandra, I. M. Raciti, A. Paudice and E. Sorano

9.1 Introduction

Several national and international agencies have proposed practices to be implemented to increase Patient Safety.

Recent laws of the Italian State have made mandatory measures to reduce adverse events. These indications require an organized plan to develop Risk Management at the level of large hospitals.

The authors propose to look for areas on which to develop the Risk Management system through the analysis of recorded adverse events (Incident Reporting, Sentinel Events), reports and litigation, also

T. Capasso (✉) · G. Fornero · U. Fiandra · I. M. Raciti · A. Paudice
Clinical Risk Management Unit, University Hospital Città della Salute e della Scienza of Turin, Turin, Italy
e-mail: tcapasso@cittadellasalute.to.it

G. Fornero
e-mail: gfornero@cittadellasalute.to.it

U. Fiandra
e-mail: ufiandra@cittadellasalute.to.it

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analyzing the economic part, comparing them with the data present in literature.

Patient safety needs an appropriate Clinical Risk Management System.

Clinical Risk Management is one of Clinical Governance interventions for quality improvement through a systematic process, including both the clinical-assistance and management dimension, which employs a set of methods, tools and actions that allow to identify, analyze, evaluate, process and monitor risks in order to improve the safety of patients and operators.

Clinical Risk Management studies the error and causes of the error, mapping the processes and implementation of evidence-based practices. The tools available are many and can be usefully integrated and adapted to specific realities, also based on the knowledge and experience already started.

The Ministerial Recommendations arise from the analysis of Sentinel Events occurring within the national and international sphere, providing indications on "how to do" to avoid errors related to specific problems of clinical assistance.

A strong and cooperative relationship between Clinical Risk Management professionals, Hospital management, Medical and health professionals.

Although the Italian state has begun to officially treat the management of the Clinical Risk in 2004 with the publication of the report "The problem of errors" of the technical commission of the Ministry of Health established by decree in 2003, the laws regulating the management of the Clinical Risk come to light about 15 years later, in 2017.

This is the Law n° 24 of March 8, 2017, which defines the management of Clinical Risk, and the Law n° 219, December 2017, which regulates the Informed Consent, the Advanced Provisions of Treatment

I. M. Raciti
e-mail: iraciti@cittadellasalute.to.it

A. Paudice
e-mail: apaudice@cittadellasalute.to.it

E. Sorano
Department of Management, University of Turin, Turin, Italy
e-mail: enrico.sorano@unito.it

(DAT), as well as the therapeutic resolution, with the exception of pain therapy, in the case of short-term prognosis, if requested by the patient.

These rules, which have required a very long maturation time, have within them the tools that allow the construction of a Health System not only safer, but also more respectful of the dignity of people, be they patients or health professionals.

The respect and protection of the assisted person, whose will is essential for any medical treatment (Law n° 219/17 art. 1), the safety of the care and the assisted person, the respect of the professionalism of the health professionals (Law n° 24/2017 art. 16) constitute, in a specular way, the basis of dignity and trust that can increase the safety of the system.

It is necessary to reorganize a Clinical Risk Management system according to priorities based on the international scientific literature and national legislation. This system needs to take into account the number/type of claims for damages, sentinel events, adverse events and complaints in the Headquarters of the University Hospital Città della Salute e della Scienza of Turin, a University Hospital that counts 2318 beds, 91,252 admissions (in addition to outpatient and diagnostic activities), 1553 doctors and 3845 nurses (December 31, 2017).

9.2 Literature Review

Clinical Risk Management is responsible to identify, prevent and manage the risk of error in the health sector, with the aim of improving the quality of health services and ensuring the safety of patients. This is the support on which we must base the development of a new culture, to passing from the culture of guilt of medical error characterized by isolation, silence, defensive medicine to a culture of transparent error analysis, in search of organization critical points, to introduce corrective actions.

Clinical Risk Management develops in four main phases:

1. identification of the risk profile in the examined area, which varies by type, structure, specialty;
2. set up and application of prevention measures;
3. activation of a control system to observe the effect of any applied prevention measures;
4. proposals for progressive improvement in order for prevention to be effective.

E. Turillazzi and M. Neri[1] state that in Italy, a gradual transformation has been underway now for several years. Key points are the efficiency of the health system, the appropriateness of services and the accountability of all health professionals. There is a risk, however, that all the strategies and measures which support this process will not achieve their goal if they fail to take account of the central issue in building relations of trust with patients.

L. A. Helmchen et al.[2] affirm that, to respond proactively to patient safety events, many healthcare organizations have been enhancing and customizing their event reporting systems. Yet an indiscriminate expansion of the range and number of event reports may reduce, rather than raise, risk managers' ability to detect events that warrant a response. To avoid becoming overwhelmed by too many event reports that have little immediate operational value, risk managers therefore require a concurrent and complementary refinement of their data-processing capabilities.

D. M. Studdert et al.[3] believe that, in the current debate over tort reform, critics of the medical malpractice system charge that frivolous litigation (claims that lack evidence of injury, substandard care, or both) is common and costly.

K. L. Posner et al.[4] report that patient complaints about physicians are strongly associated with malpractice risk. Physicians at high risk for lawsuits tend to have poor communication skills and are more commonly the subject of patient complaints about communication issues. If a malpractice action does not arise, patient complaints nonetheless represent significant prelitigation transaction costs for the healthcare system that

[1] Turillazzi E., & Neri M. (2015, April 5). Informed consent and Italian physicians: Change course or abandon ship from formal authorization to a culture of sharing. *Medicine, Health Care and Philosophy, 18*, 449–453.

[2] Helmchen, L. A., Burke, M. E., & Wojtusiak, J. (2015). Designing highly reliable adverse-event detection system to predict subsequent claims. American Society for Healthcare Risk Management of the American Association. *Journal of Healthcare Risk Management, 34*(4).

[3] Studdert, D. M., Mello, M. M., Gawande, A. A., Gandhi, T. K., Kachalia A., Yoon C., Puopolo A. L., & Brennan T. A. (2006, May 11). Claims, errors, and compensation payments in medical malpractice litigation. *The New England Journal of Medicine, 354*, 2024–2033.

[4] Posner, K. L., Severson, J., & Domino, K. B. (2015). The role of informed consent in patient complaints: Reducing hidden health system costs and improving decision making. American Society for Healthcare Risk Management of the American Association. *Journal of Healthcare Risk Management, 35*(2).

have not been previously quantified. Informed consent complaints represent a unique constellation of clinical communication skills clearly tied to malpractice risk.

According to Charles Vincent (2011), creating security is observing the rules and agreeing to follow the standard procedures (protocols and guidelines for clinical practice), but making health safer has proved to be a much bigger challenge than expected. Reducing the frequency of errors and damage will require many years of effort. Considerable progress has been made in terms of awareness and understanding, as well as solutions and interventions to reduce errors and damage: above all, today we discuss open and weighted damages involving health workers at all levels, to make healthcare safer; open discussion also allows the active involvement of patients and family members in care.

The Italian law "Provisions on the safety of care and the assisted person, as well as on the professional responsibility of health workers" March 8, 2017, n° 24 states:

- Safety of care is a constituent part of the right to health and is pursued in the interest of individuals and the community.
- Safety of care is also achieved through the combination of all activities aimed at preventing and managing the risk associated with the provision of health services and the appropriate use of structural, technological and organizational resources.
- The risk prevention activities implemented by health, social and health services, public and private, must compete with all personnel, including freelancers.

The Law "Rules on informed consent and provisions for early treatment" December 22, 2017, n° 219 protects the right to life, health, dignity and self-determination and establishes that no health treatment can be initiated or continued without the free and informed consent of the person concerned, except in cases expressly provided for by Law.

9.3 Methodology and Data Collection

The working group includes a professor of Business Management at the School of Economics and Management of the University of Turin and professionals of Quality, Risk Management and Accreditation department of the University Hospital Città della Salute e della Scienza of Turin.

All data relative to claims for damages (number, category and economic amount), sentinel events (according to the Italian Sentinel Events Monitoring Protocol list, there is an obligation to timely communicate the event to the Ministry of Health, in order to understand the circumstances and factors that have favored their occurrence), adverse events (number, category) and complaints (number, category) were collected and used to carry out a qualitative and quantitative analysis.

A qualitative and quantitative analysis of claims for damages (number, category and economic amount), sentinel events (protocol list Ministry of Health), adverse events (number, category) and complaints (number, category) was carried out.

Through the analysis of the reports is then possible to identify critical points in the system and suggest possible solutions, also through the elaboration of recommendations and guidelines, which give indications to promote the appropriate actions at the organizational level.

The results that derive from the monitoring activity of "Sentinel Events" do not represent data of incidence or prevalence of the events themselves, since the primary objective of a monitoring system of this nature is to learn from them and implement actions and changes that reduce the probability of occurrence.

The following were used: the SIMES (Ministry of Health, Information System for Monitoring Health Errors) database (claims for damages: number, category and economic amount paid, sentinel events) and University Hospital Città della Salute e della Scienza of Turin databases (incident reporting, claims, report).

For each category identified, claims for damages received were analyzed, with reference to the year of occurrence (data was analyzed not according to the cash flow criterion but based on the year of occurrence of the event to have a real dimension of the phenomenon), to evaluate possible actions of prevention of Clinical Risk.

Furthermore, the classification was carried out taking into account: total cases, liquidated cases, open cases, archived cases, paid amount.

We intend to verify some working hypotheses:

– Are claims for damages and reimbursements in line with AGENAS[5] data?

[5] AGENAS: Italian National Agency for Regional Health Services.

– Are the Sentinel Events of the University Hospital Città della Salute e della Scienza of Turin in line with national data?
– Has the development and diffusion of detection systems led to an increase in reports?
– Claims on claims start from data updated over time? Do they offer a significant time sequence or should they be considered over the years?

9.4 Findings Discussion

9.4.1 Results

9.4.1.1 Total Claims

The Information System for Monitoring Health Mistakes (SIMES) aims to collect information on sentinel events and claim reports throughout Italy, allowing risk assessment and complete monitoring of adverse events.

This process is preliminary to each action of continuous improvement in terms of Clinical Risk.

The claims for damages to University Hospital Città della Salute e della Scienza of Turin (2004/2017) are reported in Table 9.1.

In recent years, the total is not complete due to a delay of claims, since patients have many years to take legal action.

Claims that lack evidence of error are not uncommon, but in most cases compensation is denied.

The amount paid does not exceed €4,738,377 per year; the value of production of University Hospital Città della Salute e della Scienza of Turin for the year 2017 was €1,008,322,402.

For the years in which the data can be considered consolidated, claims for damages vary between 0.07 and 0.18%, compared to the AGENAS report 0.10%; reimbursements vary between 0.02 and 0.07%, compared to the AGENAS report 0.05%.

9.4.1.2 Sentinel Events

Sentinel Events are particularly serious, potentially avoidable adverse events that can result in death or serious harm to the patient and may result in loss of public confidence in the health service. The occurrence

Table 9.1 Total claims

Year	*Open*	*Liquidated*	*Closed*	*Total*	*Amount paid €*
2004	14	21	31	66	2,819,458
2005	31	35	45	111	4,738,377
2006	33	51	50	134	3,284,867
2007	50	42	57	149	1,655,124
2008	62	62	40	164	3,991,473
2009	67	41	37	145	1,225,973
2010	99	20	16	135	777,781
2011	106	19	27	152	1,754,389
2012	105	21	10	136	397,277
2013	126	5	11	142	3850
2014	101	0	14	115	0
2015	91	0	7	98	0
2016	57	0	1	58	0
2017	40	0	1	41	0
Total	1011	341	381	1733	23,602,012

Source SIMES database claims for damages to University Hospital Città della Salute e della Scienza of Turin (2004/2017)

of a single case is sufficient to give rise to a fact-finding investigation to ascertain whether eliminable or reducible factors have contributed to it and to implement the appropriate corrective measures by the organization.

According to the Italian Protocol for the Monitoring of Sentinel Events of July 2009, there is an obligation to timely communicate the event to the Ministry of Health.

The monitoring of errors in healthcare aims to collect, among other things, information on "Sentinel Events" that occur in the Italian Health Service, in order to understand the circumstances and factors that have favored their occurrence.

Death or serious injury due to patient fall are the first Sentinel Events (Table 9.2).

The presence of suicide or attempted suicide of a patient in the hospital in the third position is sign that there is a lack of reporting: suicide or attempted suicide of a patient in the hospital cannot be invisible or not reported, while the other Sentinel Events can be unrecognized or not reported.

Table 9.2 Sentinel events Italian case studies

Type of event	*N°*	*%*
Death or serious injury due to patient fall	1140	29.3
Any other adverse event that causes death or serious damage to the patient	532	13.7
Suicide or attempted suicide of a patient in the hospital	494	12.7
Retention of gauze, instruments or other material inside the surgical site	274	7.0
Death or serious damage following surgical intervention	233	6.0
Death or permanent disability in healthy newborn baby weight exceeding 2500 grams not related to congenital disease	150	3.9
Death, coma or serious functional alterations derived by errors in pharmacological therapy	132	3.4
Transfusion reactions by incompatibility AB0	113	2.9
Maternal death or serious disease related to labor and/or childbirth	97	2.5

Source SIMES database (2016)

In the University Hospital Città della Salute e della Scienza of Turin Death or serious injury due to patient fall are again the first Sentinel Events (Table 9.3).

Suicide or attempted suicide of a patient in the hospital is at the second place.

Table 9.3 Sentinel events University Hospital Città della Salute e della Scienza of Turin case studies

Type of event	*N°*
Death or serious injury due to patient fall	6
Any other adverse event that causes death or serious damage to the patient	1
Suicide or attempted suicide of a patient in the hospital	4
Retention of gauze, instruments or other material inside the surgical site	3
Death or serious damage following surgical intervention	1
Death or permanent disability in healthy newborn baby weight exceeding 2500 grams not related to congenital disease	1
Death, coma or serious functional alterations derived by errors in pharmacological therapy	2
Transfusion reactions by incompatibility AB0	0
Maternal death or serious disease related to labor and/or childbirth	2

Source SIMES database sentinel events to University Hospital Città della Salute e della Scienza of Turin (2015/2017)

9.4.1.3 Falls

Falls are the most common adverse event in hospitals and they can cause harmful, immediate and late consequences, even serious ones.

According to the WHO (2004) "Falls and damages related to them are a priority issue for health and social systems in Europe and in the world, especially taking into account the rapid growth of life expectancy".

The containment of risk from patient falls is to be considered an indicator of quality of care: it is found among the six patient safety objectives of the Joint Commission International for the accreditation of hospitals (2014) "Reducing the risk of harm to the patient consequent to accidental fall".

The adoption of "Multifactorial measures to reduce falls" is one of the practices strongly recommended by the Agency for Healthcare Research and Quality (AHRQ).

The Italian Ministry of Health has included the "Death or serious damage by patient fall" in the list of Sentinel Events and in its November 2011 issued Recommendation n° 13, "Recommendation for the prevention and management of patient fall in health facilities".

In April 2015, the Italian Ministry of Health published the fifth Report Monitoring on sentinel events from which it appears that the largest number of reports by structures of the Italian Health System are related to events of patient falls. More specifically, from 2005 to 2012, 471 cases of death or serious damage were reported to the Ministry due to patient fall.

Above was reported that also in the University Hospital Città della Salute e della Scienza of Turin "Death or serious injury due to patient fall" are the most recurring Sentinel Events.

Therefore, the total number of falls and related claims from 2004 to 2017 has been further investigated.

At University Hospital Città della Salute e della Scienza of Turin the reporting of falls follows a different path from that of Incident Reporting.

Among the analyzed cases the number of reported falls shows a tendency to increase in the period of time examined (see Table 9.4), after the introduction of the hospital procedure "Risk Management of falls in hospitalized patients" and the ever-increasing awareness of usefulness to report adverse events by professionals; claims for compensation (see Table 9.5) are however very limited in relation to the high number of

Table 9.4 Total number of falls/claims for damages

	2004	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*
Total number of falls	318	391	203	399	404	503	570	566	580	509	646	547	685	659
Claims for damages	1	7	5	14	17	2	0	4	10	20	11	9	9	5

Source SIMES database claims for damages and University Hospital Città della Salute e della Scienza of Turin report number of falls (2004/2017)

Table 9.5 Total number of claims for damages for falls and amount paid

Year	*Open*	*Liquidated*	*Closed*	*Total*	*Amount paid €*
2004	0	0	1	1	0
2005	0	3	4	7	707,739
2006	0	2	3	5	9812
2007	0	5	9	14	16,459
2008	4	12	1	17	99,685
2009	0	2	0	2	6000
2010	0	0	0	0	0
2011	3	1	0	4	15,000
2012	5	4	1	10	7302
2013	13	1	6	20	1000
2014	9	0	2	11	0
2015	9	0	0	9	0
2016	9	0	0	9	0
2017	5	0	0	5	0
Total	57	30	27	114	862,998

Source SIMES database claims for damages to University Hospital Città della Salute e della Scienza of Turin (2004/2017)

falls; among these there are eight deaths, for which most of the causes are still open, as the correlation between the trauma and the unfavorable outcome has yet to be demonstrated.

In brief, there is an increase in reports but not an increase in claims for damages.

9.4.1.4 Surgical, Therapeutic or Diagnostic and Invasive Procedures Errors
The activities and the processes that can be included under the therapeutic, diagnostic, surgical and invasive procedures are very vast in terms of type and complexity.

In order to identify and possibly control risk factors and plan and implement improvement strategies it is essential to carry out an accurate analysis of each individual event and implement immediate corrective actions.

According to Tables 9.2 and 9.3, "Death, coma or serious functional alterations derived by errors in pharmacological therapy", "Retention of gauze, instruments or other material inside the surgical site", "Death or serious damage following surgical intervention", "Any other adverse event that causes death or serious damage to the patient (including

invasive procedures errors)" are among the most reported Sentinel Events, but there might also be a lack of recording.

Damage claims and amounts paid in relation to Sentinel Events "Death, coma or severe functional alterations resulting from errors in drug therapy", "Retention of gauze, instruments or other material within the surgical site" are described here, "Death or severe damage following surgery", "Any other adverse event that causes death or serious harm to the patient (including errors in invasive procedures)".

The considerations already reported with reference to Table 9.1 apply here.

9.4.1.5 Healthcare Associated Infections

Hospital Acquired Infections (HAI) are one of the most frequent and serious complications of health care. In this way, the infections arising during the period are defined HAI, or after the patient's resignation, which at the moment of the entrance were not clinically manifest, nor were they incubated. HAI are the effect of the progressive introduction of new health technologies, which if from a part guarantee survival for patients at high risk of infections, on the other hand they allow the entry of microorganisms even in body sites normally sterile.

Another crucial element to consider is the emergence of bacterial strains resistant to antibiotics, given the wide use of these drugs for prophylactic or therapeutic purposes. The WHO, launching the "Global patient safety project for the 2005–2006 biennium challenge", invoked the reduction of nosocomial infections, indicating in the prevention the way forward to protect the health of patients, avoiding rumors additional expenditure, improving the allocation of allocated economic resources to the health sector.

In Italian hospitals there are different organizational models in this field: in particular, at the hospital where the analysis was carried out the department that have competence in the field of hospital infections is distinct from the one dealing with Clinical Risk Management.

The considerations already reported with reference to Table 9.1 apply here.

9.4.1.6 Reports

They represent the reports received by the Hospital's Public Relations Office from patients, relatives and citizens regarding the provision of corporate services, suggestions, praise, proposals and complaints.

The praises constitute 20.2% of the reports, the complaints constitute 79.8% of the reports: among 23.1% concern relational aspects, information and humanization; 19.2% of reports concern waiting times and reservations; 12.5% hotel, comfort, facilities and logistics aspects; 17.1% regards technical-professional aspects and clinical documentation in the considered period of time.

9.4.1.7 Incident Reporting

Incident Reporting is a voluntary collection of anonymous forms for reporting adverse events.

In order to bring out the adverse events, data collection systems based on spontaneous reports were developed. These reports concern both the situations in which events really occurred, and those whose occurrence could lead to unfavorable events or accidents but which, for different reasons, were "intercepted" before the path ends (near miss).

The system is based on confidential, voluntary and anonymous reporting, by health professionals, of unwanted events that caused an accident, with or without damage for the patient, or a potential accident, in the situations in which the event has not occurred fortuitously so does not provide statistical data for adverse events comparable to international data since Incident Reporting is a voluntary collection of anonymous forms for reporting.

The system does not provide statistical data for adverse events comparable to international data.

In Table 9.11 "Therapeutic or diagnostic errors" are in the first place, "Death or serious injury due to patient falls" and "Suicide or suicide attempt of a patient in hospital" are in the last places: the anonymous form of the report is more reliable.

9.4.2 Discussion

The results of Table 9.1 imply that claims for damages and reimbursements are in line with AGENAS data; claims indications derived from data updated over time and do not offer a significant time sequence, but must be considered over the years.

The reading of the results of Tables 9.2 and 9.3 suggests that the culture of risk reporting must be better implemented, also in the light of article 16 co 1 Law 24/2017 "The minutes and acts resulting from the

Risk Management activity clinical trials cannot be acquired or used in court proceedings".

It was found by describing the results of Table 9.11, confirming this, that the anonymous form of the report is more reliable. It can therefore be said that the success factor of Incident Reporting is represented by the spread of a culture of non-fault: the reporting of incidents must have a confidential, non-punitive and voluntary basis.

Hospitalized procedures have been developed in line with the international literature, with the Ministerial Recommendations and with the claims for damages indicated in Tables 9.4, 9.5, 9.6, 9.7, 9.8 and 9.9. These are periodically reviewed as a result of new organizational needs and regulations and verifications conducted; a sample of clinical documentation is analyzed annually to verify its effective application.

The resolution of complaints can be an opportunity to reduce waste in health care. Reading the results suggests that healthcare systems can reduce costs and elevate patient-centered patient care practices by improving relational aspects, information and communication with patients during medical decision making through engagement strategies

Table 9.6 Total number of surgical error and amount paid

Year	*Open*	*Liquidated*	*Closed*	*Total*	*Amount paid €*
2004	4	2	4	10	76,386
2005	11	6	6	23	898,013
2006	7	11	12	30	468,170
2007	22	12	12	46	562,456
2008	20	16	10	46	1,295,387
2009	25	12	11	48	628,943
2010	28	8	3	39	740,740
2011	30	9	10	49	302,325
2012	28	8	4	40	158,274
2013	33	1	0	34	0
2014	16	0	0	16	0
2015	14	0	1	15	0
2016	10	0	0	10	0
2017	5	0	0	5	0
Total	253	85	73	411	5,130,693

Source SIMES database claims for damages to University Hospital Città della Salute e della Scienza of Turin (2004/2017)

Table 9.7 Total number of therapeutic or diagnostic error and amount paid

Year	*Open*	*Liquidated*	*Closed*	*Total*	*Amount paid €*
2004	4	13	15	32	2,144,137
2005	11	20	20	51	2,864,284
2006	13	26	21	60	1,814,028
2007	16	16	20	52	665,894
2008	23	16	17	56	1,867,240
2009	27	10	9	46	247,195
2010	24	7	1	32	30,503
2011	23	6	6	35	890,940
2012	24	3	3	30	181,542
2013	25	0	0	25	0
2014	16	0	1	17	0
2015	14	0	2	16	0
2016	2	0	0	2	0
2017	6	0	0	6	0
Total	228	117	115	460	10,705,763

Source SIMES database claims for damages to University Hospital Città della Salute e della Scienza of Turin (2004/2017)

Table 9.8 Total number of invasive procedure error and amount paid

Year	*Open*	*Liquidated*	*Closed*	*Total*	*Amount paid €*
2004	1	0	0	1	0
2005	1	0	0	1	0
2006	0	0	0	0	0
2007	1	0	0	1	0
2008	0	0	0	0	0
2009	1	2	1	4	1000
2010	1	0	0	1	0
2011	5	1	1	7	20,000
2012	3	1	1	5	3560
2013	6	0	1	7	0
2014	4	0	0	4	0
2015	7	0	0	7	0
2016	6	0	0	6	0
2017	0	0	0	0	0
Total	36	4	4	44	24,560

Source SIMES database claims for damages to University Hospital Città della Salute e della Scienza of Turin (2004/2017)

Table 9.9 Total number of hospital acquired infections and amount paid

Year	*Open*	*Liquidated*	*Closed*	*Total*	*Amount paid €*
2004	1	4	1	6	0
2005	2	1	1	4	71,500
2006	2	5	1	8	114,692
2007	2	5	1	8	274,787
2008	8	3	1	12	55,075
2009	7	4	0	11	232,995
2010	8	0	0	8	0
2011	10	0	0	10	0
2012	9	2	1	12	25,000
2013	4	0	1	5	0
2014	4	0	0	4	0
2015	6	0	0	6	0
2016	3	0	0	3	0
2017	5	0	0	5	0
Total	71	24	7	102	1,357,648

Source SIMES database claims for damages to University Hospital Città della Salute e della Scienza of Turin (2004/2017)

such as decision making shared also through the application of Law 219/2017 (see Table 9.10).

9.5 Conclusion and Limitations/Further Steps

In the Città della Salute University Hospital, action plans have been improved with regard to:

- Review and implementation of hospital procedures.
- Updating and sharing with interested professionals the methods of verification for the application of the procedures.
- Audit with the professionals involved.
- Involvement in training courses on the various paths.
- Widespread information and dissemination to employees, assisted persons/caregivers and citizens.

The obvious changes in the clinical risk scenario, where daily the attention of the media focuses on events of malpractice, bring the citizens and health professionals to pay more attention to the type of interventions to be implemented according to the most frequent categories of events.

Table 9.10 Reports

Complaints	*2015*	*2016*	*2017*	*Total*
Other	88	22	23	133
Hotel aspects and comfort	54	40	36	130
Relational aspects	120	68	47	235
Professional technical aspects in the health field	111	52	45	208
Medical records	37	43	0	80
Reservation system	11	5	4	20
Praise	136	123	81	340
Information	56	49	20	125
Support patients	21	42	17	80
Waiting time	101	94	109	304
Humanization	9	8	12	29
Total	744	546	394	1684

Source University Hospital Città della Salute e della Scienza of Turin database (2015/2017)

Table 9.11 Incident reporting

Incident reporting	*2015*	*2016*	*2017*	*Total*
Other	7	17	20	44
Dental avulsion	6	30	0	36
Fall	1	2	1	4
Foreign body	8	5	0	13
Devices	15	23	14	52
Therapeutic or diagnostic error	29	38	31	98
Surgical error	0	2	2	4
Clinical documentation	0	0	2	2
Patient identification	5	8	7	20
Patient positioning	1	2	3	6
Loss of dental prothesis	1	0	0	1
Blood transfusion	5	1	6	12
Trauma	4	6	2	12
Suicide	0	2	0	2
Total	82	136	88	306

Source University Hospital Città della Salute e della Scienza of Turin database (2015/2017)

Considering the critical points emerged from the claims for compensation, increases the possibility of intervention at an organizational level, as well as the provision of training/information on implementing the

"Quality System". This would allow professionals to be in the conditions to operate in safety and to protect the patient and is a responsibility that belongs to the hospital management. To achieve this result, a strong and explicit commitment of the top management is essential for the development of the Clinical Risk Management system with the involvement of the same who must feel an active part of the process.

Thanks to the multiprofessional and multidisciplinary collaboration of professionals and stakeholders, including those belonging to the Quality, Risk Management and Accreditation Unit, organizational changes resulting from data analysis and aimed at the prevention of Clinical Risk, are seen as a fundamental tool to start a continuous improvement process. In light of what has emerged, it is believed that the activity of Clinical Risk Management must assume a "transversal" nature with respect to management processes of the Hospital.

The relative results may be useful to configure more precisely the quality improvement, in the context of the simultaneous verification of balance financial/economic and compliance with the parameters relating to volumes, quality and outcomes of care. The management control activity must be consistent with the clinical governance of the Hospital with a view to protect the rights of the patients, the clinical effectiveness of the performance and of the economic-financial equilibrium. Publishing compensation data on the Hospitals' website granted in the last five years helps to further qualify the social responsibility of all public and private structures in terms of improved transparency of management action.

The next important step is the mapping of risks by processes and by units, starting with a self-assessment.

Further steps: simple prediction algorithms can supplement expert judgment by screening for reports that are likely to result in a claim, thereby enabling risk managers to evaluate adverse event reports more expeditiously and to identify, and ultimately prevent, serious safety lapses more reliably. So the dashboard must be simplified and made more useful.

At the beginning it was said that "Patient safety needs an adequate Clinical Risk Management System". References were the AHRQ list of strongly recommended and recommended practices for patient safety, the British Medical Journal list of evidence-based interventions to reduce adverse events in hospitals and the new Italian laws.

E. Hollnagel, R. L. Wears, and J. Braithwaite[6] state that safety management should now move from ensuring that "as few things as possible go wrong" to ensuring that "as many things as possible go right". This perspective is called Safety-II; it relates to the system's ability to succeed under varying conditions. A Safety-II approach assumes that everyday performance variability provides the adaptations that are needed to respond to varying conditions, and hence is the reason why things go right. Humans are consequently seen as a resource necessary for system flexibility and resilience.

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CHAPTER 10

The Data Quality for Healthcare: The Risk Management Tools

Paolo Pietro Biancone, Andrea Martra, Silvana Secinaro and Daniel Iannaci

10.1 Introduction

The major welfare challenges for the promotion of the wellbeing and health of citizens and communities, in addition to requiring an effective integration of policies, policies and interventions by the different areas of welfare, also require a cohesive system that leads to convergence of funding, coming from the different sectors involved, on shared and outlined objectives and thematic areas. From this point of view, the increasing attention of decision-makers (and researchers) to the concepts and tools

P. P. Biancone (✉) · A. Martra · S. Secinaro · D. Iannaci
Department of Management, University of Turin, Turin, Italy
e-mail: paolo.biancone@unito.it

A. Martra
e-mail: andrea.martra@unito.it

S. Secinaro
e-mail: silvana.secinaro@unito.it

D. Iannaci
e-mail: daniel.iannaci@unito.it

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of “corporate governance”, “internal audit”, “risk management” and, in relation to the sphere of clinical activity, is placed, “clinical governance”, “clinical audit”, “clinical risk management”.

The support of health by using healthcare systems is very important. The reason for this is the fact that health is an important factor of economic growth as a form of human capital, as is shown in many research studies (Lucas 1988; Sala-i-Martin 1996). Healthcare systems in Europe are a duty, imbedded in our European culture to help people in sickness, to promote a healthy society through education and for the prevention of diseases (Unger 2012; Hejdukova 2016). The specific objectives of the welfare challenges are, on the one hand, those of enhancing the elements of excellence of the Health Service and of investing in strategic sectors such as prevention, new technologies, information and information systems, clinical governance and safety of care, research and medical innovations; on the other hand, those to tackle the critical issues of the system, with particular attention to the recovery of efficiencies and appropriateness and to the improvement of perceived quality on the part of citizens, all within a framework of sustainability. The stakeholders are to be identified as well as in the figures of patients and their families, in operators of public services, in private social, in the management of the complex structure and department, in the management of the Health Local Unit—HLU (Azienda Sanitaria Locale—ASL) and in local administration. The management of the risk profile of the health care company presupposes the definition of an organized and conscious intervention, systemic and continuous, combining strategic activities and decisions and a phase of operational management. Risk management (RM), in turn, is based on the knowledge of the elements that make it up. These elements can be described as the set of threats in which the risks materialize (i.e. the source of risk), the company resources affected by the threat (the various company sub-systems exposed to risk), the vulnerabilities that make the resources threatened more attackable (weaknesses that can increase the likelihood that the materialization of the threat will give rise to damage) and, finally, the “consequences” of the occurrence of the threat (the set of effects on all the components of the business system). Once the risk elements under management have been defined, it is therefore possible to describe the management cycle. The key moments of this cycle are firstly the involvement and training of personnel and

the identification of the objectives of the RM function. At the end of this preparatory phase, the risk identification phase is located, through the reconstruction of the company risk profile.

At a national level, we are still far from a single strategy for managing health care risks.

The purpose of this study is to create the premises for designing data collection and reporting systems that are useful to all stakeholders (external and internal to the service), through the identification and collection of significant accounting and non-accounting data for local public services.

10.2 Literature Review

The first research on risk is attributed to Bernoulli who in 1738 proposed measuring risk with the geometric mean and minimizing risk by spreading it across a set of independent events; the economic concept of diversification had emerged (Allais 2008; Holton 2004; Stearns 2000). Further, Henri Fayol, at the beginning of the last century, had identified RM as one of the six main functions of the management of a firm, calling it the security function (Fayol and Peaucelle 2000). Fayol's studies were not, however, applied, and several years passed before RM took hold (Verbano and Venturini 2011).

The result of the thorough analysis of the scientific and managerial literature and manuals led to the identification of nine main paths of development in the overall field of RM (Table 10.1): Strategic risk management (SRM); Financial risk management (FRM); Enterprise risk management (ERM); Insurance risk management (IRM); Project risk management (PRM); Engineering risk management (EnRM); Supply chain risk management (ScRM); Disaster risk management (DRM); Clinical risk management (CRM).

These paths of development differ from one another not only because of the different definitions of RM provided by the respective authors, but, more importantly, because of the different approaches used, risks considered, techniques and methodologies proposed and fields of application (Verbano and Venturini 2011).

Last year saw the publication of IS0 31000:2009, a new globally accepted standard for RM together with a new, associated vocabulary in

Table 10.1 The main paths of development in the overall field of RM

The main paths of RM	*Description*	*Authors*
Strategic risk management	The implementation of an integrated and continuous process of identification and assessment of strategic risks that are obstacles to reaching the financial and operational goals of an organization	Chatterjee et al. (2003), Clarke and Varma (1999), Miller (1992), Rawls III and Smithson (1990), Roberts et al. (2003), and Smith et al. (1990)
Financial risk management	Practice creating economic value in an enterprise using financial techniques and methodologies to manage risk exposure	Akkizidis and Khandelwal (2007), Crockford (1986), and Jorion (2000, 2007)
Enterprise risk management	Extension of FRM to non-financial circumstances. Recent area	Abdallah (2013) and Beasley et al. (2005)
Insurance risk management	The process of pure risk management in a company, based on the observation of already happened harmful events, the application of a prize and the subjective evaluation based on the experiences and skills of the evaluator	Gahin (1967), Petroni (1996), and Williamson (1985)
Project risk management	Formal, systematic process integrated into the life cycle of any project that involves defining objectives, identifying sources of uncertainty, analyzing these uncertainties and formulating managerial responses to them to develop an acceptable balance between risks and opportunities	Fang and Marle (2012), Raz and Michael (2001), and Ward and Chapman (2003)
Engineering risk management	Complex and continuous process that involves managing the planning, design, operation and evolution of an engineering system to identify and choose appropriate responses to problems related to different risk factors through the adoption of a systemic and proactive approach	Garvey (2008), Lyons and Skitmore (2004), Meyer and Reniers (2016), and Paté-Cornell (1990, 1996)

(continued)

Table 10.1 (continued)

The main paths of RM	*Description*	*Authors*
Supply chain risk management	Collaboration with the partners in the entire supply chain with the aim of developing a shared RM process to deal with the risks and uncertainties resulting from logistic activities and resources	Brindley (2017), Deshpande (2012), Jüttner et al. (2003), and Lee (2008)
Disaster risk management	The approach is an integral part of the governing of any community, involving a series of actions and tools expressly aimed at reducing disaster risks in regions at risk and mitigating the spread of disasters, maintaining the processes, structures and rigor typical of RM	Agrawal (2018), Carreño et al. (2007), P. K. Freeman et al. (2003), Garatwa (2002), Tatano (2003), and Yodomani (2001)
Clinical risk management	An approach to improving quality in healthcare which places special emphasis on identifying circumstances which put patients at risk of harm, and then acting to prevent or control those risks. The aim is to both improve safety and quality of care for patients and to reduce the costs of such risks for health care providers	Reed (1997), Snowden (1997), Vincent et al. (2000), and Walshe (2000)

Source Own source

ISO Guide 73:2009. These were developed through a consensus-driven process over four years, through seven drafts and involving the input of hundreds of risk management professionals around the world. The need for compromise and change is the inevitable consequence of standardization (Avanesov 2009; Leitch 2010; Purdy 2010). Figure 10.1 shows the Qualitative analysis of degree of risk impact.

Table 10.2 shows the management phases of the activity: stakeholder analysis, risk identification, risk analysis, risk assessment, RM and monitoring.

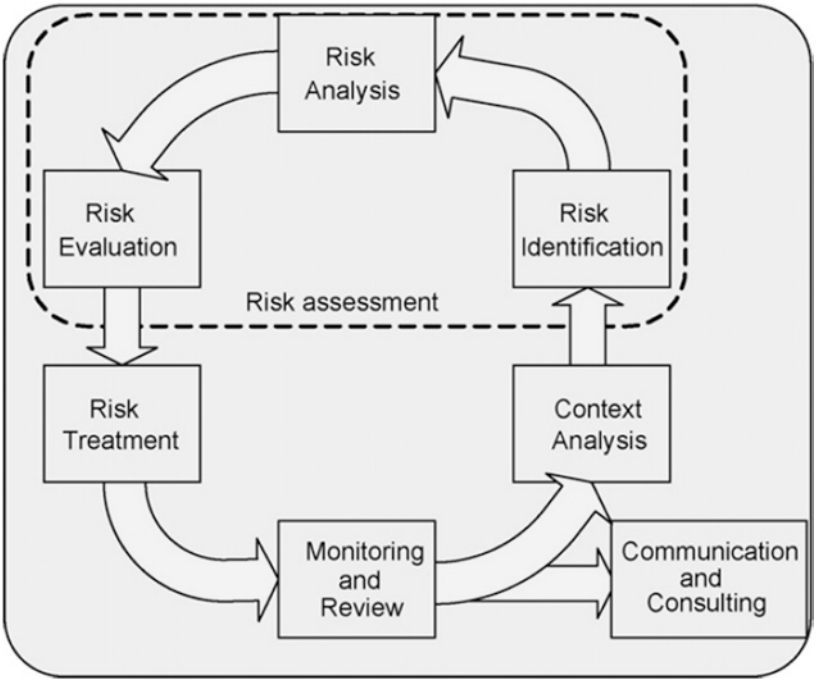

Fig. 10.1 Qualitative analysis of degree of risk impact (from the guide ISO 31000:2009-risk management, published by the International Organization for Standardization) (*Source* Aloini et al. 2007)

Public companies are characterized by the production of goods and services that are aimed at a collective consumption that also takes into account the goal of redistribution of wealth (Puddu et al. 2013). The public company is an open economic system, because it is addressed to society, and dynamic because it is constantly evolving and must meet the objectives with efficiency and effectiveness (Puddu 2001). Companies are inserted in a context of rational administration, which is an administration based on the reason from which the accountancy also derives. This type of administration is characterized by "objective" choices that are the product of "objective" information. Objectivity therefore finds

Table 10.2 The management phases of the activity

Phase	*Description*
Context analysis	Stakeholder analysis is fundamental. According to the Stakeholder theory, the realization of any commercial activity must be aimed at favoring the relationships and interests of the different parties involved. Interest groups are classified as environment—customers, shareholders and companies—and categorized according to the process—workers and suppliers (Atkinson et al. 1997). The involvement of all stakeholders must create a mapping of them. The top management in the governance of the company is required to involve both the passive stakeholders and the active in the decisions (Freeman et al. 2007). The theory based on the rights of the various stakeholders focuses attention on all those groups that could have an interest in the provision of the service (Mitchell et al. 1997)
Risk identification	Managing the information needs of all risk management activities in such a way as to allow both the correct processing of possible management alternatives and the choice of the optimal one (Forestieri 1996)
Risk analysis	Define the probability of occurrence and the potential consequences of the individual risks previously identified for risk analysis
Risk evaluation	Distinguish between high priority risks and those with lower priority
Risk treatment	The complex activity aimed at reducing risks or mitigating the economic-financial impact of their effects (Borghesi 1985)
Monitoring	Monitoring the effectiveness of the selected treatment methodologies and management strategies implemented by the management

Source Our production

its importance in public accounting where knowledge is needed in order to be able to make choices (Puddu 2001). Choices must be the result of reasoning based on adequate and correct information. No choice can be considered correct if a study of the necessary information is not based on it. The information must be received by the company information system to produce useful knowledge for the decision-making process. Furthermore, the rational administration is based on an important spatio-temporal subdivision. About the temporal dimension they are identified:

1. *The time of the forecast*: the moment in which we try to predict what future operations and results will be. The synthesis of this is the preventive budget.
2. *The time of execution*: continuous updating of accounting.
3. *The time of the check*: to find out if what had been foreseen in the budgets is matched with what really happened (Puddu 2006).

About the economic space profile three types of space are identified:

1. Financial.
2. Balance.
3. Economic.

The timing of the forecast intended as programming is one of the most important elements of the public company because it is the moment when the company gives to itself the parameters and objectives to be achieved. The rules of public companies are mainly linked to the estimate, in private companies, however, is the final balance to be considered fundamental.

Basically, the standardization process, which would imply both the definition of the sequence of activities to be subjected to the patient and the preventive quantification of the productive factors (personnel, drugs, examinations, etc.) necessary for the performance of the service, is difficult to achieve (Barretta 2004). These specificities are mainly typical of services aimed at the user characterized by a high degree of personalization (Druta et al. 2013; Morosini et al. 2005).

However, the management and organizational peculiarities of healthcare companies may present some conditions that increase the likelihood of an effective control system (Brusa 2000), depending on two "material" and "immaterial" dimensions. The doctrine identifies in the "material dimension" the map of responsibilities and accounting and extra-accounting instruments (Bergamin Barbato 1991). The "immaterial dimension" concerns the role of control and the consequent organizational aspects (Riccaboni 2003).

This study aims to use tools typical of accountability (accounting, extra-accounting data related to the effectiveness and efficiency of management control) to the advantage of reducing the risk management and treatment of patients.

10.3 Methodology

This research was carried out using the qualitative method, following the methodology of case studies. Explore through the Case Study means asking yourself the questions "why" or "how" some phenomena occur and requires an extensive and detailed description of a circumstance. The case study allows the investigator to focus on a case by obtaining a real and holistic perspective (Eisenhardt 1989; Yin 2014).

Our study met the computerized means of the health system. With SPIDI, a project of the OED-Piedmont (Regional Epidemiological Observatory of addictions—Service of epidemiology of the ASL TO3) it opens the way for interesting study perspectives and the assessment of the phenomenon of addictions in Piedmont.

As a preliminary step, the map of the responsibilities of the health entities was defined, the technical and accounting instrumentation available and the presence of ad hoc extra-accounting indicators were analyzed, by accounting tools.

In detail, we started by considering that in every local health service there are fixed costs: operators in charge, service management costs, etc., and variable costs: use of medicines and health devices.

In addition, there are some costs that we can consider as direct: that are directly charged to the patient's cost, such as patient performance, administration of the therapies and costs that are indirect that must be spread on all the patients in charge of the service according to the number of interventions that are performed on different patients.

Therefore, in the present work, we tried to carry out two types of evaluation.

1. The first evaluates the average cost per capita of the treatments.

This has fixed costs and variable costs. Variable costs change depending on the number and type of patients in charge.

2. The second one sets the ambitious goal of going to evaluate the costs of the different treatments.

In this case it was necessary to: identify the individual services, identify the costs and assemble them in treatments. There are two problems.

a. The costs of the services must be assessed as the sum of the operator's cost (direct cost) and the management costs of the center (indirect cost). The evaluation of the indirect cost poses a series of problems because it is not fixed but varies depending on the number of services performed during the year and on the balance sheet items. Therefore, they vary from year to year.
b. Treatments are not an element of easy standardization because they are linked to the clinical variability of the patients and to the variability of the intervention of the different operators, above all in contexts such as that of addictions.

The necessary material is:

– Balance of the department or service or cost center.
– Unit costs of operators working in direct contact with patients.
– *N* of services performed during the year and times of the individual services.
– Value of indirect costs understood as those costs that cannot be directly attributed to the cost of the service.

10.4 Results

10.4.1 Costs of the Health Entities in 2015

Part I includes the costs incurred as per the 2015 balance sheet. The final balance (Table 10.5) has been divided into residential costs (therapeutic communities), human resources costs, costs of drug therapies (extrapolated from the costs of health goods) and costs of health and non-health goods and services.

Patients from the entire Department, including those in prison, were considered, as the balance also includes prison costs. The different cost centers were not considered for the analysis counts, but they were all treated as a single cost center.

10.4.1.1 Clinical Features of Patients

In 2015, a total of 1349 pathologies were treated in the Health Entities. The subdivision of patients by dependence and for the four outpatients was presented. Table 10.3 highlights this distribution.

Table 10.3 Subdivision of patients

	Entity 1	*Entity 2*	*Entity 3*	*Entity 4*
Heroin addicts	454	218		60
Alcoholics			211	
Cocaine addict/THC	91	97		
GAP			93	
Teenagers	70			
Tobacco dependence		*55*		

Source Our production

Table 10.4 Patient characteristics

Number of patients and therapies/therapeutic communities	*Clinic*	*Prison*	*Total*
Patients in methadone (MT)	484	30	514
Buprenorphine patients (BPN)	200	10	210
Patients in alcover (GHB)	43	1	44
Patients in the community program			90
Total patients in the department	1229	100	1329
Total patients without MT BPN GHB therapy	502	81	583

Source Our production

Patient characteristics (Table 10.4)

- Heroin users: the population of heroin patients is 732 patients. Of these 484 are treated with methadone and about 200 in buprenorphine.
- Alcoholic patients: the population is 211 patients, of whom 43 follow an alcover therapy.
- Cocaine addict and THC employees: total 189.
- Teenagers: 70.
- Players: 70.
- Tabagists 55.
- Prison: there are about one hundred patients in treatment, of which 30 on methadone therapy and 10 on Buprenorphine therapy and 1 on Alcover.
- Therapeutic communities: about 90 patients are included in community structures.

Table 10.5 2015 balance sheet and unbundled data

	Report 2015	*Extracted data*
Employee costs	€3,633,724.02	
Other forms of work	€84,820.95	
Administrative staff		€122,240
"Clinical" staff		€3,596,304.97
Total personal cost		**€3,718,544.97**
Total costs for medicine	**€312,643.89**	
Metadone		**€168,272.58**
Buprenorfina		**€75,428.16**
Alcover		**€44,421.70**
Other days		**€24,521.45**
Residential assistance	€2,404,548.57	
Semi-residential assistance	€24,800.20	
Residential and semi-residential assistance		**€2,429,348.77**
Costs for health goods	€51,800.30	
Non-health goods	€21,051.68	
Purchase of health services	€5711.65	
Purchase of non-health services	€412,962.07	
Depreciation	€5417.79	
Other costs	€2303.58	
Taxes	€0.00	
Passive turnover	€0.00	
Total assets and services depreciation (indirect costs)		**€499,247.07**
Total	**6,959,784.70**	**6,959,784.70**

Source Our production

10.4.1.2 2015 Balance

The costs of the Health Entities in 2015 are reported in Table 10.5. These costs include all cost centers, including prison because the patients in the entire Department were considered in the analysis, as the final balance also includes prison costs. The data of the individual cost centers are not reliable for the following reasons:

1. Human resources are allocated in an "arbitrary" way, for example, some nurses of the administration service are included in the cost center of Entity 1.
2. The goods and services have been included in cost centers where no such good or service has been requested and consumed.

For this reason, the calculations have been carried out on the whole department and not on individual clinics (Table 10.5).

The costs of the therapeutic communities vary according to the type of structure (residential, semi-residential, double diagnosis, reintegration, etc.), therefore an average cost calculation has been done on all the patients included in these structures.

10.4.1.3 Average Costs Per Capita

Costs Therapies and Therapeutic Communities

Average per capita costs of methadone, buprenorphine and alcover therapies were calculated through annual costs and the number of patients receiving these drugs. The other drugs have been included in the indirect costs, there is a large part of patients during the year who are taking treatment both sporadically and continuously.

The costs of Methadone and Buprenorphine are quite similar.

In the same table, the average cost of the rehabilitation center path for the year 2015 has been included. It should be noted that if the average per capita costs are not mutually exclusive (except for methadone and Buprenorphine), they can be added together (e.g. a patient in CT can have therapy with Methadone and therefore the cost will be the sum of the two).

The average cost per patient is shown in Table 10.6a.

Direct and Indirect Costs

Two evaluations were carried out: the first through the 2015 final balance have generally defined the average cost of patients; the second evaluation instead tried to define the costs of the individual services with the intent of preparing treatment packages.

Define direct and indirect costs, it has been arbitrarily decided to calculate human resources on cases (excluding administrative staff),

Table 10.6a Average cost per patient

Medium processed cost	*Cost of the year (365 days)*	*Cost of the day*
Average cost MT (514 pcs)	€327.38	€0.90
Average cost BPN (210 pcs)	€359.18	€0.98
GHB average cost (44 pcs)	€1009.58	€2.77
Community program (90 pcs)	€26,992.76	€73.95

Source Our production

Table 10.6b Indirect costs of the health entities

	Annual cost	*Cost per day (250 working days)*	*Cost per hour (average 7.4 hours per day)*
Personal administrative cost	122,240.00	488.96	66.07
Indirect costs	499,247.07	1996.99	269.86
Total indirect costs	621,487.07	2485.95	335.94

Source Our production

possible therapies with Metadone Buprenorphine and Alcover and the costs of the therapeutic communities as direct costs. The drugs other than those listed above have been included in the indirect costs for two practical reasons: the costs are low (€24,521.45) and it is difficult to quantify the patients who take such therapy because some assumptions are continuous, while others are temporary or point-like.

Indirect costs have been defined as those costs that are not directly attributable to the patient's performance, but which must be added proportionally to the benefits. For indirect costs, the sum of health and non-health goods and services, of pharmacological therapies (after having separated the costs of Metadone Buprenorphine and Alcover) was carried out, and the costs of the therapeutic communities were separated. The total is €621.487.07 (Table 10.6b).

Indirect Costs Per Capita

The average cost per person net of clinical staff, treatment and community pathways was calculated on 1.329 patients (including patients in prison) and was €467.64/year (Table 10.7).

Table 10.7 Average costs per capita treatment

Total costs per capita/year	*Without human resources*	*With human resources*
Therapy, indirect costs + human resources	€795.01	€3501.04
Patient in MT	€826.82	€3532.84
Patient in BPN	€1477.22	€4183.24
Patient in GHB	€27,460.40	€30,166.42
Patient in CT without replacement therapy	€467.64	€3173.66

Source Our production

Average Costs of Human Resources
The average cost per capita of human resources has been calculated on 1329 patients and is €2.706,02. Patients in the therapeutic community were also calculated despite the residential program committing several service resources.

Average Costs Processing Processes
The treatments (Table 10.7) include the sum of the possible treatments (pharmacological and/or residential) + the indirect costs + the costs of human resources.

10.4.1.4 Activities in the Clinics and Costs of the Activities
The activities of four outpatient clinics were taken into consideration: Entity 1, Entity 2 (illegal substances), Entity 3 (only on alcohol) and Entity 4 (methadone administration and prompt assistance). In these outpatients, "simple" performances were identified and later it was attempted to aggregate them in "complex" or "treatments". This last aspect presents a series of difficulties mainly linked to two factors: the strong clinical variability of the patients and the mental trait approach of the operators which tends to be heterogeneous.

Simple Performance
Simple performance is an activity performed by a single individual, whether direct or not on the patient. The activities or performances of all the operators of the department operating in the treatment of patients have been detected. For each performance, 10 minutes were added to enter data on the information system (SPIDI) and to fill in the medical record.

The administrative staff (two units in Entity 1, one in Entity 2 and one for the prison) were not taken into consideration, which is charged as an indirect cost.

The hour and minute average costs of the operators are listed in Table 7.8. The costs are taken from an average operator cost. The costs of the services are calculated by the cost of the individual operators (Tables 10.8 and 10.9).

Indirect Costs of Services
How to calculate the indirect costs of individual services?

Table 10.8 Human resources costs

Professional category	*Total unit cost*	*Cost now (on 250 days of work) sector: 7.2 hours a day, management: 7.6 hours a day*	*Cost/ minute*
Administrative section[a]	30,560	16.98	0.28
Professional educators (EP)	37,860	21.03	0.35
Social workers (AS)	32,795	18.22	0.3
OSS[b]	26,351	14.64	0.24
Doctors (Med)	105,750	55.68	0.93
Nurses (IP)	37,860	21.03	0.35
Psychologists (PSI)	62,020	32.64	0.54

Source Our production

[a]The administrative department does not carry out activities on the customer and has therefore been included in the indirect costs (4 administrative: total €122.240 per year)

[b]The Healthcare Workers (OSS—Operatori Socio Sanitari) act as support for nursing services, as well as dealing with logistics. In this case, only nursing services were considered when present

Table 10.9 Indirect costs 2015

	Annual cost	*Cost of the day (250 days)*	*Hourly cost (average 7.4 hours per day)*	*Minute cost*
Personal administrative cost	122,240.00	488.96	66.07	1.1
Indirect costs	499,247.07	1996.99	269.86	4.5
Total indirect costs	621,487.07	2485.95	335.94	5.5

Source Our production

The total indirect costs are: €499.247,07+administrative staff costs €122.240 per year. Total: €621.487,07. The indirect costs of the department per day are €2485.95 (Table 10.9).

The sanitary system has created a computerized system. It made this transition with SPIDI, a project of the OED-Piedmont (Regional Epidemiological Observatory of Dependencies—Epidemiology Service of the ASL TO3) and paving the way for interesting study perspectives and the assessment of the phenomenon of addictions in Piedmont.

The application currently in use is HTH-SerT.

It is financed by the Piedmont Region, HTH is a Web-oriented application intended for public services operating at a regional level in the field of pathological addictions (Pathology Dependencies, SERT, Alcology Services, Road Units, Drop-In, etc.) (Regione Piemonte 2018).

Table 10.10 Other services (outside Spidi) year 2015

	N year performance (4× 2)	*Minutes to performance*	*Total minutes*	*Total hours*
Equipe meeting (15 operators)	104	120	187,200	3120
Secretary (3 operators)	250	396	297,000	4950
CDA (20 operators)	12	90	21,600	60

Source Our production

The indirect cost is a cost that affects the individual performance in a variable way depending on the number of services performed during the year. It is possible to see the number of performances (and relative standard durations) carried out in 2015. Unfortunately this value is not very reliable because the values must be taken from the SPIDI database, which however tends to be incomplete for two reasons: different services are not included o for forgetfulness or for lack of legend (e.g. phone calls, team meetings etc.), while others are not inserted because they would take too much time (administration of drug therapies).

The costs not reported on SPIDI were taken from the reports of the administration and from the work done by the trainees of the Faculty of Economics: Table 10.10 shows the services of the Clinical Secretariat (Secretariat) and the two main meetings (Team Meeting and Board of Directors) Corporate (CDA).

The data of the administration of the therapies are in Table 10.11.

Table 10.12 calculated the indirect costs derived from the cost now (Table 10.9) and the minutes of services performed in the year 2015.

Table 10.11 Performances year 2015

Performance	*N performance*	*Average time to performance (minutes)*	*Total minutes*	*Total hours*
Methadone administration at entity 4 (2 operators)	21,505	5	215,050	3584.17
administration of therapies in the clinics (2 operators)	8928	5	89,280	1488.00
Administration of treatment in prison (2 operators)	9390	5	93,900	1565.00

Source Our production

Table 10.12 Indirect costs to be charged on the individual performance

	Minutes year	*Minutes day*	*Hours of day*	*N performance for hour*	*Indirect cost now to performance*
Performance only Spidi	1,191,480.00	4765.92	79.43	10.73	31.3
Spidi performance + other performance	2,095,510.00	8382.04	139.7	18.88	**17.8**

Source Our production

These costs vary depending on the number of services performed each year and therefore should be calculated year by year.

In Table 10.13, there are the total costs of the individual services

Treatment Packages and Complex Treatments

Identification of Treatment Packages

Identifying standardized treatment packages is an almost impossible task since the treatments vary from patient to patient, also depending on the operators who handle it.

The aspects to be considered in a treatment are the type of services provided, their frequency and the overall duration of treatment.

Table 10.13 Total costs of services (unit cost + indirect cost)

Performance	*Time (minutes)*	*Unit cost*	*Indirect cost*	*Total cost*
Med-short visit	15	13.92	4.45	18.37
Med-visit standard	30	27.84	8.9	36.74
Med-long visit	60	55.68	17.8	73.48
Med-complex visit	90	83.52	26.7	110.22
Med-ECG	45	41.76	13.35	55.11
Med-discussion case	30	27.84	8.9	36.74
Med-team case discussion	30	27.84	8.9	36.74
Med-report certification	60	55.68	17.8	73.48
Med-meeting on the case	120	111.36	35.6	146.96
Med-organizational activity/ coordination team, etc.	120	111.36	35.6	146.96
PSI-interview	60	32.64	17.8	50.44
PSI-complex interview	90	48.96	26.7	75.66

(continued)

Table 10.13 (continued)

Performance	*Time (minutes)*	*Unit cost*	*Indirect cost*	*Total cost*
PSI-group	120	65.28	35.6	100.88
PSI-case discussion	30	16.32	8.9	25.22
PSI-team case discussion	30	16.32	8.9	25.22
PSI-certification report	60	32.64	17.8	50.44
PSI-meeting on the case	120	65.28	35.6	100.88
PSI-organizational activity/ coordination team, etc.	120	65.28	35.6	100.88
AS-interview	45	13.67	13.35	27.02
AS-complex interview	90	27.33	26.7	54.03
AS-group	120	36.44	35.6	72.04
AS-discussion case	30	9.11	8.9	18.01
AS-team case discussion	30	9.11	8.9	18.01
AS-certification report	60	18.22	17.8	36.02
AS-meeting on the case	120	36.44	35.6	72.04
AS-organizational activity/ coordination team, etc.	120	36.44	35.6	72.04
EP-interview	60	21.03	17.8	38.83
EP-complex interview	90	31.55	26.7	58.25
EP-group	120	42.06	35.6	77.66
EP-discussion case	30	10.52	8.9	19.42
EP-team case discussion	30	10.52	8.9	19.42
EP-certification report	60	21.03	17.8	38.83
EP-meeting on the case	120	42.06	35.6	77.66
EP-group	120	42.06	35.6	77.66
EP-organizational activity/ coordination team, etc.	120	42.06	35.6	77.66
IP-simple performance (therapy + urine)	5	1.75	1.48	3.24
IP-complex performance (ECG levy, etc.)	20	7.01	5.93	12.94
IP-interview/meeting	30	10.52	8.9	19.42
IP-discussion case	30	10.52	8.9	19.42
IP-discussion case in team	30	10.52	8.9	19.42
IP-report certification	30	10.52	8.9	19.42
IP-match on the case	120	42.06	35.6	77.66
IP-compilation cleaning requests, etc.	60	21.03	17.8	38.83
IP-organizational activity/ coordination team, etc.	120	42.06	35.6	77.66
IP-Somm short methadone	2	0.7	0.59	1.29
IP-Somm media methadone	5	1.75	1.48	3.24
IP-Somm long methadone	8	2.8	2.37	5.18

Source Our production

Some protocols tend to be more standardized because they are managed by a single treatment group, as in the case of "Aress"—Regional Health Services Company (Azienda Regionale Servizi Sanitari) that deals with the paths of job placement. It is important to stress that often the individual treatment packages must be assembled in complex treatments (Fig. 10.1). Therefore, treatment can have different levels of complexity.

For example, the health intervention, in addition to medical examinations will have a part of therapy and a part of urinary metabolites, as well as periodic blood tests and ECG. The frequency of visits, administration of therapies and controls vary from person to person (and from doctor to doctor …).

Ars Libera is a standardized intervention with fixed procedures and deadlines but managed by several operators.

On the other hand, psychological interventions tend to be "simple" with and fixed cadences and managed by a single operator (Fig. 10.2).

10.4.1.5 Diagnostic Treatment

Figure 10.3 is a diagram of diagnostic treatment. It should be noted that the therapies are not part of the treatment because it is a consistent variable of treatment. Below is a list of the performance of a patient's average treatment with good treatment compliance.

The costs of blood tests, which are not charged to the final balance, are not included in the calculation, any treatments with pharmacological therapies that are part of accessory treatment packages as per the scheme in Table 10.14.

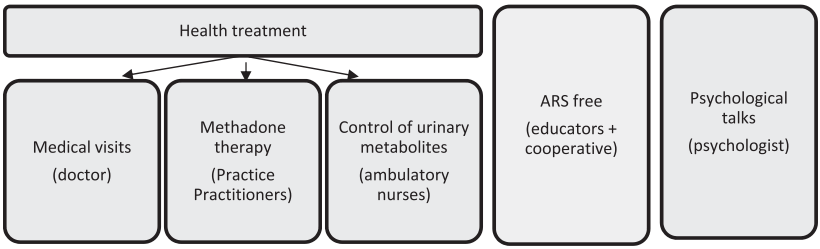

Fig. 10.2 Example of treatment (*Source* Our production)

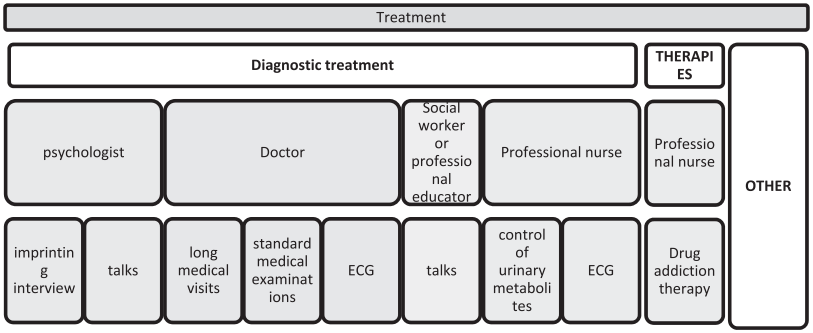

Fig. 10.3 Example of treatment (*Source* Our production)

Table 10.14 Diagnostic treatment

Diagnostic treatment: duration about 3 months EP				
Performance	Time	Unit cost	Quantity	Total cost
PSI-imprinting interview	60	50.44	1	€50.44
Med-long visit	60	73.48	1	€73.48
EP-interview	45	38.83	3	€116.49
PSI-interviews	60	50.44	5	€252.20
Med-long visit	60	73.48	2	€146.96
Med-visit standard	30	36.74	3	€110.22
Med-discussion case	30	36.74	1	€36.74
EP-case discussion	30	19.42	1	€19.42
PSI-case discussion	30	25.22	1	€25.22
Med-relationship	60	73.48	1	€73.48
PSI-report	60	50.44	1	€50.44
EP-report	60	38.83	1	€38.83
Med team case discussion	30	36.74	1	€36.74
PSI-discussion team case	30	25.22	1	€25.22
EP-discussion of a team case	30	19.42	1	€19.42
Med-ECG	45	55.11	1	€55.11
IP-ECG	20	12.94	1	€12.94
IP-haematochemical examinations	20	12.94	1	€12.94
IP control metabolites	10	6.47	20	€129.43
Total				**€1285.72**

Source Our production

*Socio-educational benefits may have an educator or social worker. The costs range from €1285.72 with a professional educator to €1244.66 with a social assistance

10.5 Conclusion

The study made it possible to identify the costs of individual services and arrive at identifying an average treatment cost and identifying accounting and non-accounting data useful for a data quality system that is attentive to managerial logic. This is a path that can bring significant benefits when planning resources and distributing workloads, as well as in terms of RM. Last but not least, it serves to evaluate the efficiency of the service on the territory, combining clinical and ethical aspects with economic aspects.

This is a study still in its embryonic phase that aims to use typical tools of responsibility (accounting, extra-accounting data on the effectiveness and efficiency of management control) to the benefit of reducing the RM and treatment of patients.

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CHAPTER 11

How Can the Cartorisk Sham Method Boost Up the Risk Management in the Healthcare System of Piedmont?

E. Sorano, Anna Guerrieri, Vincenza Palermo and Rebecca Rotti

11.1 Introduction

Nowadays, the patient safety is a topic of strong attention on the part of the entire healthcare system, especially focused to contain spending and efficient use of resources. Improving patient safety through the decrease of the error probability, it is possible to obtain a higher quality of the service offered and, at the same time, reduce waste. Programs to improve

E. Sorano (✉) · R. Rotti
Department of Management, University of Turin, Turin, Italy
e-mail: enrico.sorano@unito.it

A. Guerrieri
Sham, Rome, Italy

V. Palermo
ASL TO 4, Ivrea, Italy

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the quality of health services are a necessary investment: on the one hand to promote the appropriateness of the assistance given to citizens and, on the other, to ensure the sustainability of the system. In this regard, it needs to develop an appropriate system of clinical risk management (CRM) that allows to analyze and avoid errors and risks to which the healthcare company is exposed. The CRM is the process that measures and estimates the risks and uses the information gathered to develop strategies to govern it.

In 2003, the Italian Ministry of Health established the Technical Commission on Clinical Risk (Ministerial Decree, 5 March 2003) with the aim of studying the causes of the clinical risk and techniques to manage it.

In 2004, the Commission realized the document "*Risk Management in Healthcare. The problem of errors*", which identifies the main categories of errors that can occur in healthcare organizations. For instance, the use of drugs in laboratory medicine, in radiological activity, in diagnostic activities, in the various clinical activities, in communication, etc. Furthermore, it provides a series of recommendations for operators that work in the healthcare environment.

With the Stability Law of 2016, the legislator established the risk management (RM) as a mandatory activity of the National Health Service and has institutionalized the CRM in the healthcare facilities. In addition, the law states that "the implementation of health risk prevention and management activities is a primary interest of the National Health System because it allows greater appropriateness in the use of available resources and guarantees the protection of the patient" (Art. 1, paragraph 539, of the Law No. 208/2015).

In order to pursue the safety of the assisted person, the legislator also intervened in the area of the appropriateness of the medical care supplied by the National Health System and the consequent positive effects in the use of available resources. Paragraph 539 states that: "for the achievement of the objective related to the paragraph 538, […] the regions and the autonomous provinces of Trento and Bolzano require that all public and private structures, that provide health services, activate an adequate monitoring, prevention and management of health risk (risk management), for the exercise of the following tasks:

a) activation of audit paths or other methodologies aimed at studying internal processes and the most frequent critical issues, with anonymous reporting of probable errors and analysis of possible activities aimed at securing healthcare paths […];

b) detection of the inappropriateness risk in diagnostic and therapeutic procedures and facilitation of the emergence of possible active and passive defensive medicine activities;
c) preparation and implementation of awareness activities and continuous training of personnel aimed at preventing health risks;
d) technical assistance to the legal offices of the health structure in the event of litigation and in the activities of stipulation of insurance cover or management of self-insurance coverage".

Lastly, the Law No. 24 of March 8, 2017, known as the Gelli Law, concerning "Provisions on the safety of care and the assisted person, as well as on the professional responsibility of health care professionals", established that the safety of care is a constituent part of the right to healthcare and it is pursued in the interest of the individual and the community (Art. 1, paragraph 1, of the Law No. 24/2017). Safety of care is achieved through the combination of risk prevention and management activities, which have to be put in place by all the staff of the health care structure.

In recent time, simple ministerial recommendations have become institutional guide to which all the Health Authorities must follow for the safety of their citizens' care. In this way, private agencies support numerous healthcare organizations in the analysis and assessment of risks. For instance, Sham Group is a non-profit European mutual insurance company founded in France in 1928. It is specialized in health responsibility and CRM and it works in France, Italy, Spain, and Germany. It currently manages more than 10,000 members throughout Europe.

The choice of this company derives from its consolidated experience over the years, which has enabled Sham Group to become a leader in the health insurance sector. In addition, Sham Group has always stood out for its strong focus on policyholders, to whom it offers not only the management of claims but also provides specific RM services.

Its insurance vocation is strictly linked to the spread of the culture of risk in the medical and social welfare community of reference, as well as to the diffusion of methods and work tools applied in the field and aimed at greater awareness as regards the risks present in associated health care structures.

The relationship between Sham Group and its members has become a real partnership, aimed at ensuring the long-term insurability of health care structures, through the constant management of clinical risk, and reducing the frequency and severity of adverse events.

One of the work methods applied in the field is the a priori analysis of the main health services supply processes through the operational tool called Cartorisk Sham.

According to this information, the project would answer to the question:

> How to effectively support the associated health care structures, public and private, and the health professionals, in the practical application of the article 1, paragraph 539, of the Law No. 208/2015 (Stability Law), related to the Gelli Law No. 24/2017?

In other words:

> How to map the risks of the main health processes in a practical, simple and fast way?

The paper is organized as follows. The following sections describe the research project, the method, and the first results.

11.2 Literature Review

RM is defined by the Committee on National Security Systems (CNSS) as "a comprehensive process that requires organizations to frame risk, assess risk, respond to risk once determined, and monitor risk on an ongoing basis" (Blanke and McGrady 2016). It plays a key role in good governance in many organizations. For instance, in the healthcare organizations the role of the RM programs is growing in the last years (Labelle and Rouleau 2017). It represents the set of various complex activities adopted to improve the quality of health services and ensure the patient safety from accidental injuries (Kohn et al. 2000).

The healthcare industry is very complex and continuous challenge sector. It should introduce new tools to manage the risks generated by new competencies (Kohn et al. 2000; Berkowitz 2001; Bunting and Groszkruger 2016; Da Silva Etges et al. 2018). In recent years, the number of claims for medical injuries has grown rapidly for main two reasons, i.e., the increased expectation and awareness of patients. Therefore, it needs to adopt all the necessary interventions that allow effective RM in order to reduce the probability of adverse events and, consequently, optimize the costs of insurance policies. Insurance premiums, paid by

organizations, represent the loss of opportunity to use that capital for other purposes or risk control initiatives (Berkowitz 2001; Kuhn and Youngberg 2002).

The healthcare RM is not just about patient safety and prevention loss, but all sectors and health operations require constant monitoring. This has led some authors to promote what is related to "Enterprise Risk Management" (ERM) approach (Kuhn and Youngberg 2002; Card and Klein 2016). ERM is the process of identifying organization's critical risks and measuring their impact on the operational objectives in order to improve the capital efficiency, the service quality, and maximize the enterprise value (Berkowitz 2001; Hoyt and Liebenberg 2011; Haney et al. 2013; Bunting et al. 2017; Da Silva Etges et al. 2018). The clinical risk managers work proactively to prevent incidents and minimize damages (Simeone 2015).

The issues of medical errors and the RM in hospitals was introduced in the book entitled "To Err is Human: Building a Safer Health System", which encouraged health systems to promote projects aimed at improving quality of healthcare. It examined problems of US healthcare system, starting with the analysis of medical errors that affect the service quality (Kohn et al. 2000; Bunting and Groszkruger 2016). With regard to this aspect, it requires to analyze medical errors because they can be risk of injury, causing suffering, or even the death; so they pose a threat to patient safety (Kohn et al. 2000; La Pietra et al. 2005; Carroll 2015; Bunting and Groszkruger 2016). Medical errors are a problem not only in hospitals, but also in other settings. For example, care cases, doctors' surgeries and private clinics (Kohn et al. 2000). They involve an increase in costs for compensation, difficulties in creating adequate insurance coverage, a loss of confidence in the healthcare system by patients, and a decreasing satisfaction of the health professionals (Kohn et al. 2000; Kuhn and Youngberg 2002; Nisio and Magrì 2016).

Starting from the observation that all human beings make mistakes, when they are involved in a process (Kohn et al. 2000; Bunting and Groszkruger 2016) and the error is a part of human reality, it is necessary to make improvements to the safety system, reporting incidents or adverse events through interviews, conducted on an individual basis or in a small group (Kuhn and Youngberg 2002; Carroll 2016). It is important to develop inside the healthcare organizations a new culture aimed at analyzing organization's critical points and initiating corrective actions.

An effective RM activity develops in several phases: (a) learning the strategic vision, through interviews and review of documents; (b) identification of risks that compromise the achievement of business objectives; (c) quantification of identified risks; and (d) treatment and monitoring of risks (Bunting and Groszkruger 2016; Carroll 2016; Nisio and Magrì 2016; Da Silva Etges et al. 2018). In order to develop a successful ERM program and deliver a safe healthcare, all hospital staff must be motivated, involved, and educated about the need to change specific behaviors and work collaboratively (Kohn et al. 2000; Kuhn and Youngberg 2002). Furthermore, it is desirable to create an organizational culture that encourages recognition and learning from mistakes (Kohn et al. 2000; Miller et al. 2012; Bunting and Groszkruger 2016).

There is not a perfect method to identify risks and dangers, but each one has its own strengths and limitations. However, the fundamental elements that underlie the risk mapping are two: the register of the dangers to which a health company can be exposed; the criteria to be adopted for measuring and representing risks.

As shown in the next sections, the first phase of the risk analysis identifies the dangers, which a healthcare company is exposed, and the adverse events that may occur as manifestation of some hazards. The second phase measures the size of risks associated with identified events and provides a representation of them. The risk associated with each hazard is measured by assigning a class of occurrence/probability and a class of damage/severity and represented by a "risk matrix". The results of the first two phases highlight the risks that need to be tackled as a priority. The last phase provides useful information to the clinical and organizational choices in order to reduce these risks.

11.3 The Research Design and Methodology

The research followed a qualitative approach, using an explorative case study methodology (Yin 2016). It is an empirical inquiry that investigates a contemporary phenomenon in its real context, especially when the boundaries between the phenomenon and the context in which it can be analyzed are not evident, and it relies on multiple sources of evidence (Yin 2017). There are many benefits in using case studies methodology. For instance, the phenomenon can be studied in its natural setting, the study enables a better understanding of the nature of the

phenomenon and allows exploratory investigations where the variables are not well understood (Eisenhardt 1989; Yin 2017; Stake 1995).

The reason why the study of a case has been chosen derives from the awareness that the analysis and evaluation of health risks that affect local health authorities' choices and actions requires a collocation within a specific context and a profound study of the interconnections existing inside the system analyzed (Yin 2017).

Data and information were collected through an approach of participant action research, which has permitted to assist all the actors involved in improving or refining their actions, and secondary analysis of internal company documents (Gibbs 2007; Bryman and Bell 2011). The action researchers engaged in an iterative process of trying out methods and instruments to strengthen the Local Health Authorities' capacity to manage risks within the health services supply processes. To guarantee the objectivity of the interpretation, two researchers, active as consultant action researchers, have participated and carried out the training courses and the interviews, analyzing them together.

Thanks to qualitative research, the researchers carry out a series of different activities, such as the interview, observation, interpretation of documents, and intense self-reflection (Janesick 1994). All these activities allow to understand, reconstruct, and interpret the phenomenon of interest and it is also necessary to use a process called *triangulation* to enhance the validity and reliability of the interpretations (Rhineberger et al. 2005).

Nowadays the action research approach is no stranger to health or social care organizations (Bate 2000; Koshy et al. 2011), even if limited evidence is available on how to manage action research programs in complex health and social care systems. Generally, the action research approach has been increasingly used in various institutional healthcare practices, because it permits to build new knowledge in practice (Aguinis et al. 2009; Huges 2008).

With the action research it is possible realized a combination of "complementary objectives" where researchers and practitioners collaborate to improve a troubled situation (Marshall et al. 2010) and the practitioners are invited to take responsibility for the change process (Atwal 2002; Bjørn and Boulus 2011; Postholm and Skrøvset 2013; Voigt et al. 2014). In particular, the practitioners' objective is to learn about the situation of concern and to achieve a resolution or at least an improvement,

whereas the researchers are interested in developing new knowledge through the analysis of the context (Marshall et al. 2010).

11.4 The Sham Project

The Sham Group project, carried out from January 2018 to December 2018, was developed to analyze a priori the risks inherent to five main health processes in a Local Health Authority of the Piedmont Area and a Turin Hospital Authority.

The analyzed processes were:

- Patient identification
- Drug track
- Person assisted in surgery track
- Person assisted in obstetrics track
- Person assisted in emergency/urgency track.

In order to implement this method, Sham Group carried out training courses in order to explain the method to all healthcare professionals and provide the basis for effective RM related to health practices. Furthermore, it formed five multidisciplinary groups of practitioners; each group was focused on a specific process.

The method developed is based on the experience of more than 600 healthcare professionals who work daily in public healthcare facilities.

The project aimed to map all the processes of the health services, to find out related risks, barriers used by management control practices, and the emergent residual risk to manage.

The project enabled to map and evaluate 804 risks. In addition, it identified and classified the processes and related sub-processes.

11.4.1 Method and Working Tool

This study applied a priori method of risk analysis developed by the Sham Group. The phases of the implementation were:

- shared planning of activities;
- structuring of multidisciplinary working groups by process to be analyzed and hospital units, with the identification of a team leader;

- training on the method and work tools;
- application of the method in the field;
- sharing and communication of achievements.

The standard mapping of the processes was carried out with the tool developed by Sham Group. For each process, the mapping imposed:

- the identification of the main sub-processes of reference;
- the identification and codification of the greater related risks;
- the assessment by the multidisciplinary group involved in the work, through the application of specific and shared scales of values.

These steps were carried out through a simple Excel matrix, where each sheet was dedicated to a single phase of the analysis process.

The standard mapping of five processes allowed the comparison of the outcomes between the different hospital units involved in the project. Furthermore, it provided the business directions by an aggregated summary of the data collected and analyzed to facilitate the appropriate corporate management (Table 11.1).

11.4.2 The Gross Weighing of Risks

The first step of the multidisciplinary group identified the gross weighing of the risks without considering the internal barriers adopted by the Operative Units (O.U.).

The evaluation was carried out by applying the following formula:

Table 11.1 The number of risks identified by the analysis process

	Number of risks per process
Patient identification	33
Drug track	53
Person assisted in surgery track	67
Person assisted in emergency/urgency track	43
Person assisted in obstetrics track	72
Total	268

Source Own elaboration

Risk = Probability of occurrence (Frequency) × Potential Damage (Severity)

The Risk Priority Index (RPI) is the result of the product of two variables, Frequency and Severity. These variables are identified through two specific scales of values with four levels (from 1, the lowest, up to 4, the highest).

11.4.3 The Evaluation of Barriers

The second phase identified and evaluated the barriers, namely the tools used within the O.U. to contain the risks linked to the analyzed process and previously weighed gross by the working group.

In this way, it allowed to identify one or more barriers used and subsequently assessed according to four different criteria:

- relevance
- reliability
- supervision
- traceability

Each criteria was assigned a score. If the criterion was satisfied, the score was 1, otherwise the score was 0 or 0.5 if it was partially satisfied:

- YES = 1
- NO = 0
- Partially = 0.5

The algebraic weighing of the values returned the "strength" of the barrier, which ranges from 4 (stronger) to 0 (nonexistent/insufficient).

11.4.4 The Net Weighing of Risks

The difference between the gross weighing of the risks (first action) and the assessment of the strength of the barriers implemented by the structure to contain them (second action) determined the net weighing of risks. An Excel worksheet collected all information. In turn, the management and containing of the residual risks were assessed as serious or very serious with RPI 8 to 16 (see Table 11.2).

Table 11.2 The gross weighing of risks

< 4	4 ≤ … < 8	8 ≤ … < 12	12 ≤ … < 16
Low	Moderate	High	Very high

Source Own elaboration

11.4.5 Actions for Improvement

Based on this analysis, the group discussed actions for creating or improving the barriers. It should be:

- Possible actions, i.e., actions projected in based on the context, human and economic resources and strategic business opportunities;
- Concrete actions, i.e., actions that defined what to do;
- Specific actions, i.e., actions well circumscribed;
- Planned actions, i.e., actions that defined who, when and how to act.

The next step was the designing of a Gantt chart sharing by the group, which reproduced the implementation phases of the various improvement projects.

Each identified action required the person in charge, the average time, and other details (i.e., who does what and when) for its realization.

The half-yearly monitoring of the project progress was planned according to the specific indicators: state of art, critical issues, changes during work, and summary data collected.

11.4.6 Time to Perform the Analysis

Taking advantage of pre-structured standard processes, the time of the analysis activities is considerably reduced compared with the average time of an analytical a priori analysis on a process.

The average commitment required to the participants of the working groups made up of about 10–12 professionals, is two days/man per process, making the planning of the activities, all ECM accredited, compatible with the healthcare organization of the structures and replicable over time.

Precisely in consideration of the heavy workload that every healthcare professional now manages and the indispensable necessary presence of professionals in the various O.U., in order to provide the services to hospitalized patients.

11.4.7 Multidisciplinary

The essential element of the multidisciplinary nature of the professionals participating in the different working groups is an added value of the method of analysis proposed and applied in the field.

It allows to:

- assess risks in their complexity according to distinct but complementary professional points of view for the quality of the services provided, the health of the patient and the control of clinical risk;
- facilitate the internal communication of professionals, as well as the knowledge and sharing of organizational criticalities and possible actions for improvement, identified and arranged in a collective manner in structural work plans with specific actors and implementation times.

11.4.8 First Overall Outputs

A total of No. 15 processes and training in the field about 150 health professionals, direct actors in the provision of health services have been analyzed in 7 months of work in the field.

For that purpose, a total of No. 26 ECM accredited training courses for the operators who took part in it were created in collaboration with the training area of the health facilities involved in the project.

A total of No. 804 risks codified and identified and assessed, if present, the respective internal barriers to contain specific risk have been evaluated.

This allowed the identification of No. 115 actions for improvement related to the same number of risks, net assessed, as serious or very serious RPI from 8 to 16 (see Table 11.1), grouped by theme in 19 macro actions for improvement in order to facilitate analysis and comparison.

The analyzes that follow are, therefore, the tangible feedback of the activities in the departments, in terms of management of clinical risk, of all 150 professionals involved in the project; protagonists facing the daily difficulties to be managed, but above all to understand and prevent.

The collected data represent the real level of sensitivity, spread of the culture of risk, and application of management tools in the real context of performance provision, supported by an objective measurement and traceability method.

It is possible, regarding these characteristics of the applied working method, to compare the results and define internal, national and international benchmarks, considering that Sham Group is a mutual company operating throughout Europe, both on the identified risks gross and net weight and on the strength of the barriers used.

Below are summary tables with summary data obtained (Tables 11.3 and 11.4).

The structures are classified dimensionally by number of beds in 3 groups:

- A (up to 500)
- B (from 500 to 1000)
- C (over 1000)

And by number of births per year in 5 groups, replicating the classification adopted in the Childbirth Assistance Certificate (CEDAP) report:

- 1 (less than 500)
- 2 (from 500 to 800)
- 3 (from 800 to 1000)
- 4 (from 1000 to 2500)
- 5 (over 2500)

Table 11.3 A priori analysis with the Cartorisk Sham Group method—processes

A priori analysis with the Cartorisk Sham method piedmont regione 1 January 2018–30 July 2018	*Updated data at 30 July 2018*			
	Number of risks per process	*Number of analyzed processes*	*Number of evaluated risks*	*Total number of operators involved*
Patient identification	33	3	99	150
Drug track	53	3	159	
Person assisted in surgery track	67	3	201	
Person assisted in emergency/urgency track	43	3	129	
Person assisted in obstetrics track	72	3	216	
Total	268	15	804	

Source Own elaboration

Table 11.4 A priori analysis with the Cartorisk Sham method—health care structures

	Range number	*Number of surgical procedures*	*Range KM*	*Birth range*	*Number of access in emergency*	*Analyzed processes*
Health unit *a*—AO Health unit *b*—ASL	A	11,407	>1	4	55,575	n. 5 processes
Hospital 1	A	7811	1	3	46,807	n. 5 processes
Hospital 2	A	5245	1	2	41,340	n. 5 processes

Source Own elaboration

Table 11.5 Case mix index

CM	
Up to 0.94	<1
From 0.95 to 1	1
>1.05	>1

Source Own elaboration

In relation to the Case Mix Index (CMI), values above the unit indicate a higher complexity compared to the standard, while values lower than unity represent a minor complexity (Table 11.5).

11.4.9 The Weighing of the Risks Compared

The analysis activity made it possible to weigh the risks identified for the 5 processes gross and net, considering the barriers used in the hospital units for their containment, with the following summary results.

The process at greatest risk appears to be the **person assisted in emergency/urgency track**, then the **patient identification** with a percentage of serious and very serious residual risks to be managed, respectively **20** and **19%** (Tables 11.6 and 11.7).

The barriers used today within the departments, i.e., internal procedures, recommendations, operating instructions, service orders in place for the greater safety of treatment and operators, have allowed the reduction of the risk assessed gross by professionals serious and very serious healthcare of around 50%, from 31 to 15% (residual net risk assessment)

At the same time, they allowed the growth of the overall low risk assessment from 39 to 74% and the moderate risk from 31 to 11% (Fig. 11.1).

11.4.10 The Strength of the Barriers Analyzed

The evaluation of the barriers applied today within the health structures participating in the project shows overall that **51% of these are defined strong, 23% satisfactory, and 26% insufficient or nonexistent**. It needs to intervene with actions aimed at strengthening them or, if absent, implement new ones in order to contain the related. The processes with the largest percentage of management tools defined,

Table 11.6 Gross risk

Process	low	moderate	high	very high	high + very high
Patient Identification	25%	32%	29%	13%	42%
Drug track	36%	35%	22%	8%	30%
Person assisted in surgery track	47%	30%	14%	8%	22%
Person assisted in emergency / urgency track	26%	36%	26%	13%	39%
Person assisted in obstetrics track	46%	25%	26%	3%	29%
Total	39%	31%	23%	8%	31%

Source Own elaboration

Table 11.7 Net risk

Process	low	moderate	high	very high	high + very high
Patient Identification	57%	24%	15%	4%	19%
Drug track	72%	13%	11%	4%	16%
Person assisted in surgery track	81%	6%	8%	4%	12%
Person assisted in emergency / urgency track	64%	16%	13%	7%	20%
Person assisted in obstetrics track	82%	6%	11%	2%	13%
Total	74%	11%	11%	4%	15%

Source Own elaboration

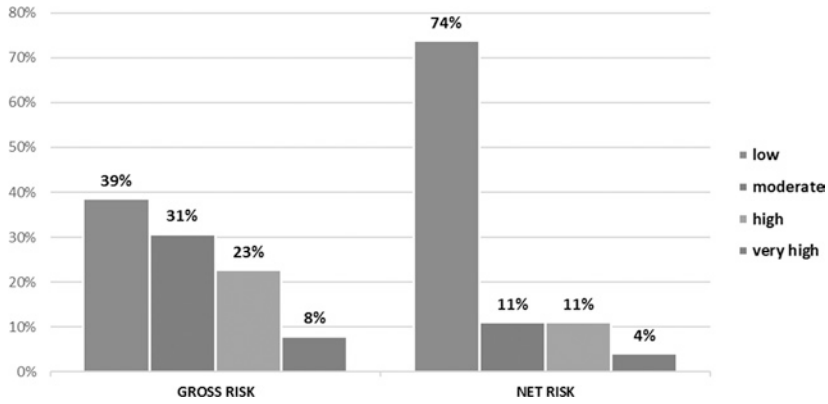

Fig. 11.1 Piedmont project at 30 July 2018 (*Source* Own elaboration)

according to the scale used, "managed" are the person assisted in surgery and obstetrics track.

The most critical issues are related to the *patient identification* process with only 30% of "strong" management tools (Table 11.8 and Fig. 11.2).

Table 11.8 Management tools

	managed	satisfactory	insufficient	inexistent	insufficient + inexistent
Patient Identification	38%	36%	12%	21%	33%
Drug track	50%	24%	13%	13%	26%
Person assisted in surgery track	59%	22%	13%	5%	19%
Person assisted in emergency / urgency track	43%	21%	17%	19%	36%
Person assisted in obstetrics track	58%	16%	10%	16%	25%
Total	51%	23%	13%	14%	26%

Source Own elaboration

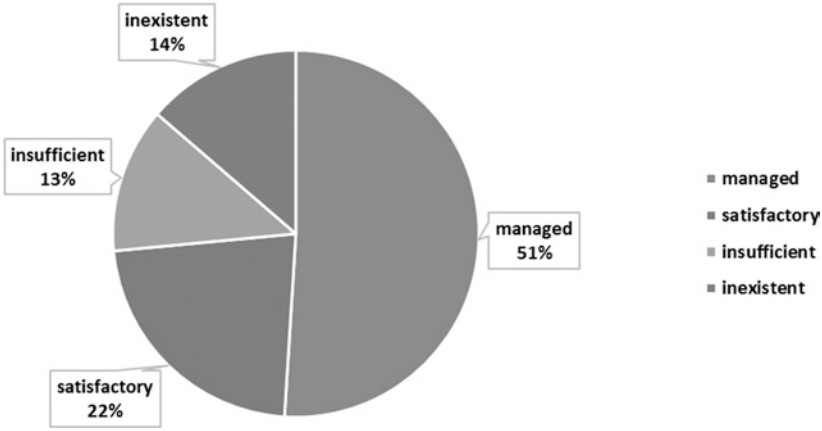

Fig. 11.2 Piedmont project—management tools at 30 July 2018 (*Source* Own elaboration)

11.4.11 Actions for Improvement

Overall, the work of multidisciplinary teams by process allowed to identify a total of No. 115 actions for improvement related to as many risks assessed net of serious or very serious with RPI from 8 to 16 (Tables 11.2 and 11.9).

The largest percentage of actions for improvement in relation to the total number of risks analyzed per process is 19% for the patient identification process, proving that a much-debated issue is still today a source of numerous and serious risks, and to the person assisted in emergency/urgency track equal to 18%.

Table 11.9 The improvement actions for each processm

processes that are object of the study	number of risks analyzed	Number of high / very high net risks subject to improvement actions	in %
Patient Identification	99	19	19%
Drug track	159	21	13%
Person assisted in surgery track	201	26	13%
Person assisted in emergency / urgency track	129	23	18%
Person assisted in obstetrics track	216	26	12%
Total	804	115	14%

Source Own elaboration

It needed to refer to the specific analyzes by process that follow.

Overall, 14% of the risks analyzed were the subject of actions for improvement.

In order to facilitate this analysis, 19 macro thematic actions in which, organized by topic, are contained the 115 actions identified and planned in the working groups per process (Table 11.10 and Fig. 3).

Table 11.10 The 19 macro improvement actions

	Number of high / very high net risks subject to improvement actions		
MACRO IMPROVING ACTIONS	Patient voluntary removal	1	1%
	IT support	2	2%
	Lack of staff	4	3%
	Communication	4	3%
	Knowledge of the procedures	24	21%
	Device dysfunction	1	1%
	Operator disturbances / interruptions	3	3%
	Health documentation	14	12%
	Equipment in use	5	4%
	Training	7	6%
	Multidisciplinary Improvement Group	20	17%
	Patient identification	4	3%
	Indicators and Value Scales	10	9%
	Mapping of skills	5	4%
	New procedure	2	2%
	Direct observation	1	1%
	Internal organization review	5	4%
	Safe patient transport	2	2%
	Humanization of care / patient involvement	1	1%
	Total	115	

Source Own elaboration

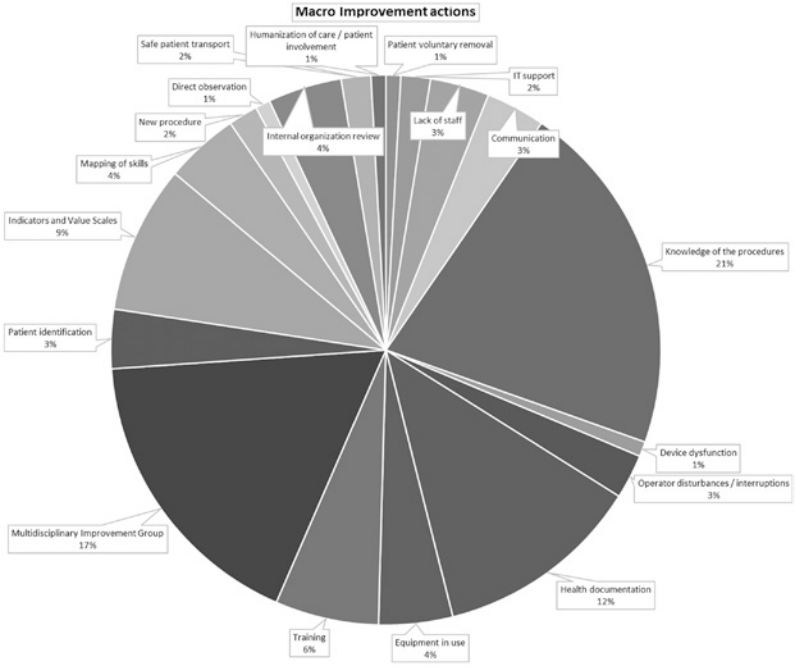

Fig. 11.3 Macro improvement actions (*Source* Own elaboration)

The most significant macro action (21%) concerns the issue of "knowledge of procedures" in place inside the structures.

The emerging remark is that there is an important break between the production and publication of internal procedures on the reduction/containment of clinical risk and their effective knowledge and application in the field by health professionals.

The large number of published procedures, the difficulty in finding them quickly and easily, the need for periodic reminders make this hiatus the subject of numerous actions for improvement aimed at creating thematic search engines for the company intranet, synthetic diagrams such as paperbacks easy to consult, specific training, mapping and harmonization of existing procedures.

Parallel the theme of "skills mapping" not only in relation to structured professionals, to implement their skills and improve the internal

organization of staff, but also aimed at "hikers" or "temporary" who enter the healthcare organization of the department in lack of staff often with skills that are not appropriate for the reference O.U., significantly increasing the risks inherent to patients.

In terms of training, there is a need for specific training for basic or advanced emergencies and greater awareness among professionals of the importance of incident reporting within the company.

The use of the bib "do not disturb" for the operators during the administration of drugs is proposed in each working group dedicated to the drug track, in order to reduce distractions, noise, disorders, calls, both from the patients/family members from colleagues during drug delivery and thus prevent adverse events or errors.

The attention to health documentation and the need to have adequate IT tools remain important, above all with regard to the instrument of the single therapy card and to the medical record.

The theme of "measurement" and "traceability" emerges as a fundamental tool for knowledge and RM: identifying specific indicators for the phenomena to be analyzed, with clear indication of the data source, as well as numerator and denominator to be specified, is shared and proposed as a concrete action for internal process improvement.

The core of many actions for improvement is the value of multidisciplinary and structural and organized sharing in dedicated improvement groups for the department or medical area of interest, where critical issues and new goals have to be tackled altogether.

For obstetrics, the opportunity of structurally arranging a dedicated anesthesiologist in the department has been noted several times.

Table 11.10 contains all the 19 macro and actions for improvement contained therein, with indication of the percentage of reference for each macro action on the total of the 115 actions for improvement defined (in bold), and specific for the actions contained in each thematic macro identified; the most significant data are highlighted in red.

11.5 Conclusion and Further Steps

The research has allowed to map No. 5 main processes for the suppyling of health services in the Piedmont area:

- Patient identification
- Drug track

- Person assisted in surgery track
- Person assisted in obstetrics track
- Person assisted in emergency/urgency track

The Sham's Cartorisk method has identified and codified 804 risks. The analysis has allowed to "measure and trace":

- the gross RPI as pure potential risks;
- the strength of the internal barriers used for their containment;
- the residual risks that remain to be managed in the structure;
- the possible improvement actions, shared and planned.

It is important to set up a database of essential information in order to understand the real level of RM within the departments and intervene with targeted and concrete improvement actions.

It has allowed training on the ECM field, on the method and tool of a priori risk analysis of about 150 health professionals in order to improve their work processes.

This research highlights future opportunities in this field. For instance:

- extend the analysis to the entire Piedmont Region as well as to other Italian regions, implementing data collection;
- quantify this data with internal reports of adverse events or claims for claims received/claims occurred by O.U.;
- quantify the costs incurred in relation to the types of damage;
- comparison between risk mapping and harmful events;
- measure the economic and clinical benefits through indicators and specific management models, determine the implementation of a similar working method produces within a healthcare structure and therefore improve corporate governance.

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CHAPTER 12

How Pioneering Managers Strive to Integrate Social Risk Management in Government Debt Collection

Paola De Bernardi, Francesca Ricciardi, Canio Forliano and E. Sorano

12.1 Introduction

In these years, a new paradigm of Public Administration is emerging in the literature, in practice, and among the larger public (Thompson and Rizova 2015). This new paradigm is often referred to as the Public Value, or the New Public Service approach (Bryson et al. 2014), and is

P. De Bernardi (✉) · F. Ricciardi · C. Forliano · E. Sorano
Department of Management, University of Turin, Turin, Italy
e-mail: paola.debernardi@unito.it

F. Ricciardi
e-mail: francesca.ricciardi@unito.it

C. Forliano
e-mail: canio.forliano@unito.it

E. Sorano
e-mail: enrico.sorano@unito.it

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regarded as the third wave of governance, organization, and management logics, after the traditional Public Administration approach (which was very popular in the 1930s–1970s) and the New Public Management one (which became dominant in the 1980s–1990s).

The traditional Public Administration approach viewed public service recipients essentially as voters and claimed that public managers should focus on efficiently implementing politically defined goals (Denhardt and Denhardt 2003). The New Public Management approach viewed recipients essentially as customers and claimed that public managers should be freed from political and bureaucratic constraints, and also empowered to leverage market and competition mechanisms, in order to improve the services effectiveness (Denhardt and Denhardt 2015). The emerging Public Value approach, conversely, views service recipients essentially as cocreators of the common good. Consistently, this approach claims that public managers should catalyze and enable a dialogue-driven engagement of all the actors into democratic and networked activity systems, overcoming the traditional boundaries that exist among the government, the hierarchy, the market, and the citizens (Bryson et al. 2014).

Each of these three approaches has, of course, strengths and weaknesses (Lapsley 2009), and despite certain ideological polarizations argue that the emerging ones should completely replace the older ones (e.g., in the New Public Management rhetoric), they can in fact be viewed as complementary to each other (Esmark 2017). In real-world contexts, the three logics listed above may coexist; however, if this coexistence is not effectively governed, it may result in confusion and detrimental conflicts rather than a constructive integration. In other words, public administration institutions are often complex organizational hybrids (Hinna et al. 2018) in which different views and practices of risk management (RM) may clash (Miller et al. 2008).

This complexity is mirrored in the research and practice about RM in the public sector (Halachmi 2003). From the traditional Public Administration view, public managers should take care of financial and operational risks (Abdullah et al. 2016; Ackermann and Marx 2016; Oulasvirta and Anttiroiko 2017), usually by complying with the norms and expectations of the political decision-maker: the management of operational risks in public hospitals is a typical example (Andersson and Liff 2012). Conversely, from the New Public Management point of view, public managers should also take care of business risks, such as project-related risks in public–private partnerships (Ameyaw and Chan 2015;

Ke et al. 2010; Nisar 2007). Finally, the Public Value approach posits that public managers should also contribute to address system-level risks, such as social or environmental ones (Asenova et al. 2015; Cooper 2012; Holzmann and Jørgensen 2001; Mercer et al. 2005). However, many public administration institutions have difficulties in managing traditional internal operational risks, not to mention system-level risks that are related to public value valorization.

Despite the relevance of such intertwined RM challenges in public administration institutions (Hood and Smith 2013), we know very little on how these organizations could address such challenges and possibly integrate the different RM problems that stem from the increasing complexity of public administration. In particular, the literature on RM under the Public Value lens is particularly scant. How do public administration institutions address the social and/or environmental risks that are affected by their choices and actions? What are the institutional and organizational conditions for the effective management of system-level risks on the part of public administration institutions? How can we innovate the monitoring and decision-making processes for improving RM in the light of the Public Value approach? These questions have been surprisingly overlooked by the literature so far.

This study contributes to tackling these issues by exploring the case of a local government-owned enterprise that is specifically dedicated to debt collection (e.g., from fines, waste taxes, etc.) for local government institutions in Northern Italy. Among governmental activities, debt collection is a particularly critical one, since it can impact not only the financial stability of the government institution itself, but also its system-level role. For example, if debt collection procedures are too rigid and implacable, these may make some citizens and small business owners more vulnerable to usury or even suicide. On the other side, if procedures are (perceived as) too benevolent, cheating behaviors may be encouraged and the government institution's credibility jeopardized in front of honest payers. The key managers of the debt collection organization under study are aware of the paramount importance of such risks and are striving to develop organizational, reporting and decision-making solutions in order to formally take into account those social risk management issues in the evaluation, rule-setting, and resource allocation processes.

These managers can be considered pioneers of the Public Value approach in the context under study. However, their efforts often clash with the views of some elected officers and other public managers of the

owning body, who do not consider social risk management as part of the organization's mission, since their choices and behaviors are greatly influenced by the traditional Public Administration and/or the New Public Management approaches. These conflicting views, along with organizational and normative constraints, make the path toward the introduction of social risk management practices and tools difficult.

This case reveals some interesting critical factors that influence the transition toward a new model, which can be called "complementary logic" and reconciles the Public Value approach with the others, through the concrete efforts of implementing formal practices of social risk management.

These critical factors can be synthesized as follows:

1. The formal recognition of the organizational role of social risk management (in the absence of such recognition and consequent resource allocation, the activities of social risk management are jeopardized by the work overload of the top managers, who "volunteer" for creating and improving social risk management practices in their spare time);
2. The reconciliation of the perceived conflict between social risk management and financial risk management (the perceived tradeoff between the efforts dedicated to financial results and social impacts is often biased);
3. The need for new, network-based organizational forms and practices (social risks are system-level risk and are not effectively addressable in isolation);
4. The need for integrated, process-based RM, including the whole range of risks, from traditional operational risks to system-level social risks (to this end, the critical role of the internal control system emerges);
5. The need for innovative tools for dynamic multilevel monitoring and decision-making;
6. The need for innovative institutional work and for replicable management solutions.

To the best of our knowledge, this is the first study that investigates the problems and the evolution of RM in government debt collection organizations.

Thanks to its results, this study contributes to both the literature on Public Value and on RM in the public sector.

The remainder of this paper is structured as follows. Section 12.2 discusses the theoretical framework and related literature. Section 12.3 describes the research design and method. Section 12.4 presents the case study and our empirical analyses. Finally, Sect. 12.5 provides conclusions, points of limitation, and suggests possible avenues for further researches.

12.2 Literature Review

12.2.1 Stakeholder and Agency Theories as Lenses to "Read" the Risk Management in the Public Sector

Public sector risk has become increasingly interesting to academics and practitioners (Vincent 1996). Corporate governance reforms and new mandatory regulations have required RM as part of management controls (Abernethy and Chua 1996) and imposed to reflect about a corporate risk appetite (Collier and Woods 2011) and the achievement of its objectives (Bui et al. 2016). Risk can be defined as the probability that a damaging event occurs (Boehm 1991) and its management can be one of the key activities for identifying the factors that are critical for the success of an organization (Bannerman 2008; Boehm 1991; Zardari 2009). In particular, after the spread of purely intellectual works, the RM activity evolved from a safety matter, linked to the necessity of limiting the number of workplace accidents, to a set of methodologies and techniques aimed at limiting every kind of event that could compromise the achievement of an organization's objectives (Raz and Hillson 2005; Ammons and Canada 2000). Specifically, for local public entities that are required to deliver a range of public services in an often politically charged environment, the utilization of RM to manage stakeholders' demands should lead to effective governance and organizational performance (McCrae and Balthazor 2000). Moreover, according to Halachmi (2003), RM can also be seen as a performance indicator that should be used in order to evaluate the performance of both private and public entities.

Since the 1980s–1990s, with the spread of the New Public Management approach, public investee companies saw an increasing separation between their political and commercial aims. However, public investee companies are organizations that cannot avoid pursuing both the public and private logic (Bruton et al. 2015; Koppell 2007; Roper and Schoenberger-Orgad 2011). In fact, while public managers are required to operate in conditions of efficiency and profitability, which must be accountable to their shareholders, they are also increasingly

required to pursue different objectives, consisting in enhancing the dialogue with all the stakeholders and social recruitment.

In this context, from the point of view of the stakeholder theory (Freeman 1984), the identification of the interests of all the parties involved and the attempt to make these interests convergent, ensures that public companies can keep an adequate reputational level, which is fundamental for their long-term success, and political institutions can obtain consensus for their actions (Córdoba-Pachón et al. 2014; Jones 2009; Roper and Schoenberger-Orgad 2011; Wong 2004; Zif 1981). However, the stakeholder theory does not properly consider the problems deriving from the fusion of public and private logics. The theory of the agency (Johnson et al. 1996; Zahra and Pearce 1989) can be useful for this reason. Politicians (the agents), in fact, should act as representatives of the citizens (the principals) and their interests, but they often consider only their short-term interests related to the organizations' objectives in a public value logic (Boycko et al. 1996; Hinna et al. 2016; Sapienza 2004; Wong 2004). Academics (Boubaker et al. 2011; Gajewski and Li 2015; Roper and Schoenberger-Orgad 2011; Wong 2004) recognize transparency and voluntary disclosure as public managers' best practices. In this way, they can provide the basis of accountability at all levels and reduce both the information asymmetry among the stakeholders and the problems that derive from the colliding logics of the public and private sector.

12.2.2 System-Level Risks: Social and Environmental Risks

In recent decades, globalization, technological development, increasingly participatory, and open political systems have allowed significant socioeconomic development. However, this development has led to greater usage of natural resources. Furthermore, the recent economic crisis has made even more citizens highly fragile and vulnerable, and consequently, more exposed to risk and less equipped with tools to handle it (Holzmann and Jørgensen 2001). Therefore, companies, carrying out their activities, have been asked to pay even greater attention to system-level risks, which are external to them and significantly different from the traditional ones. In other words, managers, and particularly the ones in charge of public investee companies, should be deeply involved in the creation of public value, i.e., by taking into account both the environmental and social impact of the organizations they run.

These emerging changes have collectively led to the development of a new approach in the management, which is different from a mere governing (Halachmi 2003; Kettl 2002; Osborne 2010; Pollitt and Bouckaert 2011), of public sector companies: the Public Value approach, which states that public value has to be created and guaranteed not only by the government or politicians (Jørgensen and Bozeman 2007). However, this involves at least the two different problems listed below. (i) The necessity of more accountability and transparency can meet resistance from the top management and the political shareholders (Asenova et al. 2013). Accountability and transparency, indeed, are not more requested only by political interests and normative constraints (as in the traditional Public Administration approach) or by the market (as in the New Public Management), but also by every other stakeholder (Mulgan 2000; Romzek et al. 2012). (ii) The assessment of system-level risks—which are often qualitative and not quantitative—is complex and demands the prior involvement of the stakeholders who benefit from the public service provided (Woods 2011).

Thus, in both cases, managers are first required to actively engage citizens and organizations as problem solvers (Bryson et al. 2014) and public value cocreators (de Souza Briggs 2008). Indeed, the risk evaluation and the consequent resources allocation to handle it greatly depend on what stakeholders expect from the company to create in terms of public value (Fletcher and Abbas 2018). As reported by Jørgensen and Bozeman (2002) some of these values could be justice, social cohesion and stability, equity, transparency, accountability, and so on. More generically, everyone expects that its own aspirations about specific themes will be satisfied (Moore 1995).

Second, according to the identified risks and expectations on how to manage them, they have to think about how to gradually reconfigure the company processes. In order to achieve these objectives, they will either need to develop RM skills themselves (Asenova et al. 2015) or hire specific officers who play a fundamental role in companies (de Zwaan et al. 2011). Whereas managers could not be able to handle with social risks, their political shareholders could provide tools for managing them, promoting cohesion among citizens and their economical stability (Silver 1995) or implementing policies aimed at preventing them or, if this is not possible, mitigating or coping their harmful effects (Holzmann and Jørgensen 2001). In Moss's (2004) words, the government should be "the ultimate risk manager".

12.2.3 The Anti-Corruption Risk as a Driver to Integrate Process-Based Risk Management

Illegal activities, such as corruption, money laundering, and fraud represent a serious obstacle to the wealth of a Country (OECD 2014; Krueger 1974; Mauro 1995; Murphy et al. 1991), and therefore, they undoubtedly are factors that increase social risks, reducing the quality of the public service (Lambsdorff and Johann 2005), and affect the most fragile and poor citizens (Bosco 2016). In order to counter these aspects, shared values based on ethics and legality run parallel with the Country's regulatory framework and its effectiveness.

In Italy, the anti-corruption issue is governed by both Law 190/2012 and Legislative Decree 231/01. The former refers not only to incidences of bribery, embezzlement, and corruption in public institutions, but also to all those situations related to their "*mala gestio*", with reference to managers' private interests overlapping with public ones. The person responsible for preventing corruption is accountable even if mere attempts that go in this direction are committed. For this reason, one is required to coordinate with the Supervisory Body of the company and prepare an appropriate three-year Anti-Corruption Plan (ACP) in order to avoid the occurrence of such situations. Furthermore, this Plan must be integrated with the model requested by the Legislative Decree 231/01, although they remain as distinct documents. The cited Decree regulates the same crimes of the Law 190/2012, but, differently to that, it is applied to limited companies and does not consider situations that could damage the company itself, but only the ones that could benefit it or are conducted in its interest. Therefore, as a consequence of the peculiar condition of public investee companies, they are subject to a dual regulatory regime, drawing a strictly severe sanctions system for public investee companies: the discipline provided by the Law 190/2012 and the Legislative Decree 231/01.

Since less accountability and transparency in a company mean a higher corruption risk, also the Legislative Decree 33/2013 has to be considered. Indeed, it disciplines companies' transparency and requires that they devote an entire section of their ACP to this issue. These kinds of activities cannot only reduce the informative asymmetry existing between shareholders (agents) and citizens (principles) as clearly stated by Krishnamurti et al. (2018) and improve the corporate reputation (Sun and Cui 2014), but they have also a great impact on the stakeholders

engagement (Attig et al. 2013), making it stronger (Bénabou and Tirole 2010) and longer-lasting (Eccles et al. 2014).

The Anti-Corruption National Authority (ANAC) released its guidelines for the implementation of the anti-corruption and transparency legislation. According to these guidelines, companies should develop their ACP pursuing the following steps: (i) map the company's activities, identify, and assess the associated corruption risk; (ii) balance the possible impacts associated to the risk with the probability that it occurs; and (iii) assign a final score in accordance with the entity of the identified risk.

In that regard, if the top management wants to create the correct corporate culture and an organizational climate favorable to controls, the internal auditing activity plays a fundamental role. Indeed, internal auditors conduct these controls, prevent or mitigate the corruption risk, and lay the foundation for the achievement of the company's objectives in terms of: (i) an efficient and effectiveness management, which has to be based also on ethic principles; (ii) correct accountability, both financial and not financial; and (iii) compliance to laws and standards (European Commission 2014).

12.3 Research Design and Methods

The research followed a qualitative approach, adopting the case study methodology (Stake 2013; Yin 2017), which plays a particularly important role among qualitative methods, as it aims to generate insights from field-based data (Parker 2012). Qualitative methods offer particular value at the organization-specific level, highlighting the management decision-making processes, in a highly contextualized and situationally specific level of policy and practice insights. The case study of a local government-owned enterprise, specifically dedicated to debt collection (e.g., from fines, waste taxes, etc.) operating for local government institutions in Northern Italy. Government debt collection is a particularly critical area of governmental activities, since it can impact not only the financial stability of the government institution itself, but also its system-level role. In qualitative research, the researcher carries out a series of different activities, such as the interview, observation, interpretation of documents, and intense self-reflection (Janesick 1994). All these activities allow to understand, reconstruct, and interpret the phenomenon of interest and, specifically, it is necessary to employ a variety of perspectives and interpretations to guarantee triangulation (Rhineberger et al. 2005).

The reason why the case study design has been chosen derives from the awareness that the analysis of the social and/or environmental risks that affect local government-owned enterprises' choices and actions as well as the institutional and organizational conditions for the effective management of anti-corruption risks, requires a collocation within a specific context and a profound study of the interconnections existing inside the system analyzed (Yin 2017). The case study is attributable to the "critical cases" category, because, through an inductive-deductive approach, it sheds light on the existing integration in a specific context and, therefore, suggests a possible configuration of the integration between the management systems of decision-making processes and the improvement of the system-level risks (Otley and Berry 1998).

Data and information were collected through a series of semi-structured interviews and secondary sources of data (see Fig. 12.1) (Gibbs 2007). The evidence reported in this chapter was collected from January 2018 to September 2018. The data collection, which is still on-going, had a twofold objective: (1) analyzing the role of Public Administration managers to address the social and/or environmental risks, among others, and how the companies' processes are affected by their choices and

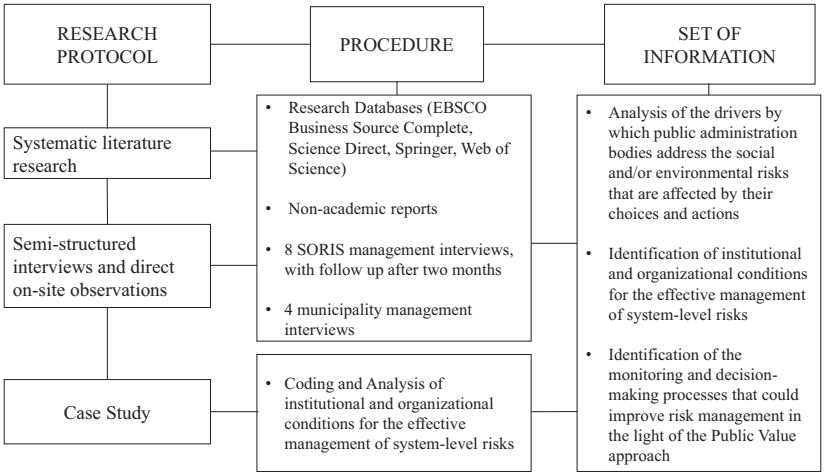

Fig. 12.1 Research design and data collection

Table 12.1 Characteristics of the interviewed managers

ID	*Job title*	*Genre*	*Age*	*Qualification*
1	General director/CEO	F	53	Master degree
2	Chief risk officer	M	60	High school diploma
3	Controller	M	36	1st level professional master
4	Legal affairs and contracts manager	M	44	1st level professional master
5	Director of the municipality participation area	M	50	2nd level professional master
6	Executive of the municipality participation area	M	43	Master degree

actions; (2) studying the role that the institutional and organizational conditions play for the effective management of system-level risks and the enhancement of the assessment, governance, and management of company's risks.

To guarantee the objectivity of the interpretation, all the researchers have participated and carried out 12 in-depth semi-structured interviews that, on average, lasted 60 minutes each and involved managers from both the Municipality of Turin and the local government-owned enterprise (see Table 12.1). The interviews were carried out in two phases: a first exploratory one and a second follow-up phase, aimed at identifying which are the RM constructs that better adapt to the analyzed company. For better observing the case under analysis, the interviews were conducted, first at the Turin Municipality and then at the company's headquarter, where it was also possible to examine and interpret internal documents. The use of in-depth interviews allowed the researchers to analyze the topic in question-based on the perspectives, experiences, and opinions of the interviewees (Silverman 2013). This qualitative instrument made it possible to grasp the nuances and contradictions recognizable to the researchers, and to identify the interlocutors' point of view about the connections that exist between particular events and phenomena. Moreover, it gave the researchers the opportunity to discuss any new queries that emerged during the interviews (Gillham 2005). To this end, a list of questions has been drawn up with the aim of stimulating and supporting the conversation, without, however, hindering the creation of a spontaneous dialogue.

The interviews were recorded, transcribed, and analyzed by all the authors. Subsequently, they were integrated through a process of data triangulation aimed at providing a "stronger substantiation of constructs and hypotheses" (Eisenhardt 1989), as well as identifying which are the possible tensions and contradictions that exist among the three different approaches in managing public organizations. These observations enriched the development of the documentation, the identification of manager behaviors, and other particular details (Locke et al. 2011), allowing to rely on a discovery-oriented interpretive approach and to emphasize an "insider" perspective (Salvato and Corbetta 2013). To better study the company, a substantial amount of empirical material has been collected, helping us to understand various points of view at different levels of the organization's hierarchy and to compare and code information that came out from different sources. The coding procedures of the collected documentation was carried out to guarantee significance of data and comparability between them and the theory, as well as the reproducibility, precision, and rigor of this research (Strauss and Corben 1990). For this purpose, every source was independently coded by at least two of the authors of the present study, through the use of the software Atlas.ti. In the first phase, raw data were processed through an open coding procedure to discover, name, and categorize concepts related to the investigated phenomenon. When the researchers agreed on a shared interpretation of the results, data were reorganized and synthetized using an axial coding procedure (Bryman and Bell 2011), in order to reach connections among the elaborated categories (and between categories and possible sub-categories). In particular, the identified risks were traced back to the recurring four ones (i.e., operational, financial, social, and environmental risks) and connected with the relevant logic that was related to one of the three different managerial approaches that each time was emerging from the interviewer's words.

In doing so we have sought to understand: (1) how RM operates in the case study and is integrated into day-to-day activities; (2) how risks are identified and reported; and (3) how managers make themselves aware of the paramount importance of social risks. Moreover, we have analyzed how managers are striving to develop organizational, reporting and decision-making solutions for formally taking into account social RM in evaluation, rule-setting, and resource allocation processes. The aim was to understand if these managers can be considered pioneers of the Public Value approach.

12.4 The SORIS Company

12.4.1 Organizational Structure, Activities, and Businesses

In November 2004, the Municipality of Turin, given the regulatory changes and the expiration of its agreement stipulated in its time with the Uniriscossioni company, conducted feasibility and economic cost-benefit study about the opportunity of outsourcing the collection of unpaid taxes processes. This study led to the establishment of Società Riscossioni SpA, a company wholly owned by the Municipality of Turin, whose name can be shortened to SORIS SpA. The company, which has been operating since January 1, 2005, was founded in order to manage all the services connected to the liquidation, assessment, and collection of municipal revenues (both on a spontaneous and an enforced basis), including those coming from taxes, and set the related, complementary, accessory, and ancillary activities aimed at supporting both taxation and the asset management responsibilities. In particular, considering every other alternative, the decision to set up a special purpose company with a business model aimed at tax collection was carried out, therefore, ensuring continuity with the pre-existing situation but rejecting the following alternative scenarios:

1. The full insourcing one, which would have involved a greater expenditure of both financial and staff resources and the impossibility of extending operations to other institutions;
2. The full outsourcing one, which would have involved a timing criticality and a loss of both control and know-how of the entire operational process.

The strategic choice made by the City of Turin also considered the peculiarities of the collection of local taxes, in which the relationship with every citizen is direct and the logic of money is different. For these reasons, the possibility of entrusting the service to Equitalia (the revenue agency managed by the Ministry of Economy and Finance) was excluded. Therefore, an ad hoc company that would be able to devote a certain attention to small claim amounts and to which the collection of the main municipal revenues could be delegated was set up. Two years after its establishment, although no regulations imposed it, SORIS decided to enroll itself to the "Register of Dealers", a list established by

the Legislative Decree 446/1997 regarding the assignment of the assessment and the collection of local authorities' revenues activities. This enrollment was conducted to fulfill a twofold objective: (1) guaranteeing the effectiveness of management, ensured by the members' possession of adequate technical and financial requisites, and sufficient moral requirements, including the absence of incompatibility causes; (2) extending the offer of its services to other Municipalities and organizations and/or multi-utilities companies in the medium-to-long term. Since 2007, the company began to deal with the enforced collection of penalties for violations of the Highway Code and both the voluntary and enforced collection of sanctions for violations of trade rules, which consequently increased both the business growth and the required workforce.

Since its establishment, SORIS has been operating according to a specific mission, which has been established in order to provide its services to citizen-users with timeliness, clarity, and transparency to guarantee them efficiency, safety, and time-sparing, and to encourage their involvement and collaboration in a logic of contributory equity and respect for taxpayers' rights. In the future, consequently, working under these assumptions, the company plans to establish itself as a reference point in the collection sector both at the local and national level. The corporate vision is, therefore, to generate value for every citizen and the public entity through the creation of a reputation that will be recognizable by all the stakeholders. Taking that into account, in terms of economic performance, as shown in the statement of changes in equity, SORIS has always been able to register profits in its annual financial statements, and data from 2017 show: revenues of €16.6 million from the collection activity, out of a total amount of about €167.6 million for the Municipality and €23 million for the Region. SORIS's profit margins have increased in time and, in 2017, the company registered approximately €1 million of net profit that was almost entirely distributed to its shareholders. In the same year, a return on equity (ROE) of 26.18% was registered. With the aim to reinforce and improve the collection activities and develop specific precautionary measures, which are necessary to strengthen the compulsory activities, the company and the City of Turin have also signed a Memorandum of Understanding in order to launch a staff extension program, which currently amounts to 64 employees. Nowadays, as a result of the Region's acquisition of 10% of the capital shares which were previously held by the Municipality of Turin, SORIS's operations have considerably increased. As a matter of fact, in 2017,

the Region acted not only as a shareholder but also as a customer, thus entrusting the activities related to the payment injunction about vehicle taxes to the company. Despite that, given the experience gained with the Municipality and being aware of the business criticalities, the debt collection company has been able to profitably manage the contractual relationship with the Region. Provisions finalized to receive advance payments before collecting the recovered sums were included in the company's scope of practice. Thanks to this collaboration, SORIS has achieved excellent performances, collecting as much as four times the money that had been budgeted in its expected operational management programs. This result demonstrates the SORIS's ability to sustainably increase its value in time, enhancing its innovative business model.

12.4.2 Customer Service: Intimately Rooted into Company's Culture and Philosophy

In September 2007, in order to support the increased demand for collection services, SORIS moved its headquarters to a new site. At the same time, not only their offices were enlarged, but also the company's value proposition was extended and a series of support and advisory services were activated. Consequently, several cash desks were opened and an ATM was set up, aiming at offering a more customized service to the citizens-customers, facilitating, on the one hand, a direct relationship with them and, on the other, guaranteeing the highest level of customer service. With the same objective of guaranteeing a transparent and fair service to the customer, the company plans to implement a feedback information collection system from its users (on-site sentiment analysis). By doing so, not only making customers' satisfaction measurable, but also making organizational and management problems more easily identifiable, giving the company the possibility to intervene promptly. Therefore, two distinctive features of SORIS's operating strategies are being achieved: the first one is the constant attention to users who frequent their offices, while the second one is the customization of the service provided, especially with regard to the weakest users (e.g., disabled individuals), who have priority access over others. The customer care is so deeply rooted in the company's culture and in the operational practices of all operators that the management has invested in training and development programs held by psychologists, which were previously attended only by its front office staff. As a result of these programs, on

one hand, standardized and common collection procedures (with the guarantee to have well defined rules and procedures) were adopted and, on the other, employees are now able to better activate empathic and resolutive communication processes designed to settle possible conflict situations. From an organizational point of view, the logistic design of the spaces and collection/liquidation and consultancy stations was redefined, making the individual activities of the collection process more harmonious. In particular, many procedures have been implemented in order to facilitate the use of services and enhance the customer experience: e.g., the deeds delivered to taxpayers have been changed so to make them aware of the related tax obligations; the booking, assistance, and payment IT tools have been adopted, even though the desired impacts have not been observed yet, probably due to the users the company interfaces with, since they are more used to traditional mechanisms characterized by direct "in-person" interactions.

12.4.3 Working Environment: Cohesion, Collaboration, Co-creation

Another peculiarity of SORIS concerns the work environment created over the years, which is characterized by collaborative and flexible practices that are finalized to satisfy everyone's needs in the best way and in the shortest time possible. These practices are especially focused on employees having a direct relationship with customers and spontaneously developed a strong cohesion and team building habits over time. The positive work environment is demonstrated by the fact that employees share convivial time even out of work hours, and despite the highly demanding workload further increased by the company policy, which would like to completely satisfy the needs of every citizen who goes to its offices, no controversy with trade unions has ever arisen.

12.4.4 Business Process Mapping to Prevent and Mitigate Operational Risks

In January 2018, the Municipality prepared a resolution aimed at introducing the same control over the in-house companies. This kind of control differs from the one that is exercised by a majority in a shareholders' meeting and is qualified as a hierarchical administrative control. In particular, the "analogous" control allows not only the public-owned company to maintain direct assignment of offices and activities, but

also allows the City of Turin to actively participate in its management, as well as to monitor its economic-financial balance. Therefore, this participation is realized through the exercise of direction and coordination powers. Supervisory activities are constantly carried out by monitoring performances through reports, on-site audits, periodic meetings between the Board of Directors of the public-owned company and the Municipal Holding Area's heads.

Moreover, since May 2018 the company has had to comply with the provisions of the EU Regulation 2016/679, known as General Data Protection Regulation (GDPR), concerning personal data processing and free movement. In particular, after its implementation, SORIS had to set up a new mapping of its processes and redesign its information system in order to ensure full traceability of the collected and managed sensitive data. Furthermore, as a consequence of the GDPR, the new role of the Data Protection Officer (DPO), who is responsible for the protection, storage, and management of the aforementioned data, was identified within the organization.

Despite the introduction of these measures, the structure of the mapped processes remained the same as the one outlined in 2005, when the company tried to identify and formalize the internal control system aiming at the prevention, mitigation, and management of eventual business risks.

12.4.5 Levels of Control and Risk Management

SORIS is risk-averse to events that could: (1) have a negative impact on the safety or wellness of its employees, the citizens-users, its customers, and other stakeholders; (2) lead to breaking local laws or regulations; (3) damage the environment; and (4) have a negative impact on the company's reputation and, as a consequence, of the entities who own it.

Risks identification and knowledge also help the management, accordingly to their tolerance level, to make decisions about how to manage events which have a potentially negative impact on: (1) the generation of cash and the business profitability; (2) the achievement of strategic objectives; and (3) the protection of tangible and intangible assets. In this context, the RM function first helps the organization to prevent and mitigate risk factors, as well as to understand and proactively seize opportunities. Second, it helps the organization to promote, together with the shareholders, a risk assessment culture in the company decisional process, particularly in the strategic planning one and in the most important operational

decisions. Finally, RM helps to ensure that the overall company's risk exposure is congruent with the Board of Director's risk propensity and with its sustainable long-term performances. Therefore, RM activities are systematically aimed at ensuring transparency and adequate information about the company's risk profile and strategies related to its management, the top management, the Board of Directors, and all the stakeholders.

In SORIS three levels of control have been identified, each of which is supervised by a specific operating unit (OU): (i) 1st level, which is a line control finalized to ensure the correct execution of operations and carried out by the operational OU; (ii) 2nd level, which is a cross-sectional control that is entrusted to an OU different from the production one, whose aim is to measure and manage compliance, and reputational and operational risks that SORIS must face in its business execution; and (iii) 3rd level, that is represented by the internal audit activities and supervised by a specific OU, on which the company plans to allocate more resources in the future.

The first-level control system was designed through interviews in order to understand the process and detect the accomplished activities amount, type and output, as well as the reference legislation. The above-mentioned interviews have been guided using a specific module that has been distributed to the following company's OU:

- Production;
- Collection, legal, and litigation;
- Back office;
- Administration, finance, planning, and control;
- Front office;
- Development and evolution of the product.

The detailed forms distributed to each manager have been summarized for the various OU's highlighting, this way, the process of business activities, whose results can be recapped in Table 12.2.

Although, from an organizational point of view, it is generally accepted that the second-level controls must be assigned to the Compliance Service, in SORIS, due to the small company size and the available resources, this function does not exist and cannot be established. Therefore, the adopted solution is the one shown in Table 12.3, in which the responsibilities entrusted to everyone are sorted by business risk's type.

Table 12.2 Process activities that have been controlled by each OU

Production OU	*Administrative and financial service*
Notices production	Repayments and reportings
Collection process evolution	Remunerations
Compensations, revocation, prescriptions	Accounting, administration, and balance sheet
Information system	
Collection OU	*Planning and control service*
General collection	Planning and budgeting
Forced collection management	Accounting system's evolution and control
Non-collectible money	Liquidity management
Legal and ligitation	
Desk service	*Back-office service*
Cash management	Cash inflows
Other activities (debt reschedulings, distinct practices, vouchers)	Remission and repayments flows
Consulting service	*Product development OU*
Consulting activities	New services development
	Institutions' approvals of the printing models and timetables

Table 12.3 Heads of the second-level controls

Risk to control	*Responsibility*	*Assured by*
Reputation risk	Auditing direction	General director
Business continuity risk	For the production information system: General vice director For the operational technological infrastructure: Head of the front office OU	Auditing and compliance direction
Compliance risk—privacy	Auditing direction	General director
Compliance risk—money laundering	Auditing direction	General director
Compliance risk—anti-corruption	General direction	Auditing and compliance direction

Source Authors' elaboration, based on company's data

12.4.6 Strategic Risks: Reputational Risk

According to SORIS, reputational risk is the negative judgment that could occur if it is unable to comply with the commitments agreed with its shareholders, which concerns the maximization of the collected sums,

and with every citizen using the company's service. In particular, SORIS aims at ensuring that every citizen understands which are the sums that have to be paid, even if it means providing additional information, and ensuring that citizens/customers are able to pay them in the easiest, fastest, and cheapest way possible. Absences of the reputational RM could lead to the spread of possible controversies that would damage SORIS's identity and good name, which have been built over the years. In fact, in a sensitive activity such as the debt collection one, where already weaker individuals are often involved, if the upstream and downstream collection activities are not conducted in an impartial manner, a series of chain reactions would be triggered: e.g., dissatisfaction of citizens, who are company's services users; Municipality reluctance to entrust new assignments; people's lack of motivation to work for SORIS, etc.

The prevention of reputational risks, which could damage both shareholders' and every other stakeholders' interests, is entrusted to the Board of Directors and to the General Management, which together have to guarantee both the achievement of the social objective and maintain the company in an economic and financial situation as balanced as possible. Indeed, operating to achieve the expected services' level and implementing preventive measures for the taxpayers' interests are OUs duties that are designed to keep relations with customers. For these reasons they must take particular care of: (i) the structure and content clarity of documents (payment reminders and coactive documents) sent to taxpayers; (ii) the exhaustiveness and the update of both the "Unified Integrated Code for the front desk service" and "FAQ" as an operational procedure and a behavioral *vademecum* for cashiers and consultants; and (iii) the cashiers' and consultants' basic training and updates on regulatory and/or process innovations. An essential prerequisite for a company's good reputation, reliability, and long-term success is to comply with the Code of Ethics; for this reason, the SORIS promotes its observance at all levels, through specific communication, training, prevention, and control activities. The Code of Ethics, a tool for the prevention and mitigation of the organizational risk, is an integral part of the organizational and management model, and is adopted in compliance with the Legislative Decree 231/2001; this is useful in order to prevent—in the interest of the company or for its benefit—the incidence of different types of violations committed by directors, managers, or employees. The monitoring and assessment of the aforementioned risk will be achieved with the draft of the Social Report, which has been scheduled for 2019.

12.4.7 Strategic Risks: Operational Continuity Risk

The reputational risk is not the only significant risk that must be tracked. In fact, there is a strong operational risk linked to the business continuity and the company's eventual inability to continue offering its service against the occurring of adverse events. In contrast to what it is usually thought, SORIS does not own the sums that have been entrusted to it and have to be collected, so it does not have to face any credit risk, but to perform its activity in strict interdependence of its two customers: Piedmont Region and the Municipality of Turin. Since these clients also qualify as shareholders, the collection activity conducted by SORIS requires particular attention. In fact, the quality of the services that the aforementioned public institutions are able to provide to their citizens could be compromised by a lack in the sums that had to be collected. Under this perspective, it would be useful to implement a more effective communication from an educational and cultural point of view, so that the citizens who are going to directly benefit from receiving timely access to the mentioned services can better understand the importance of their contribution through the payment of local taxes.

12.4.8 Strategic Risks: Anti-Corruption and Compliance Risk

Compliance risk is divided into three monitoring areas, which are effectively supervised by SORIS and linked to the following regulations: privacy, anti-money laundering, and anti-corruption. In particular, regarding the privacy topic, SORIS has designated a manager who is responsible for the implementation of all the security measures necessary for the processing of personal data, which have to be attributable to individual subjects only in the cases covered by the "necessity's principle" established in the Privacy Code. Furthermore, this risk is managed through two important corporate documents: (i) the company regulation about minimum security measures, which governs data processing and security measures; and (ii) the programmatic document for security, which concerns the analysis of risks impinging on data and procedures that have been implemented or that are going to be implemented. In order to implement the anti-money laundering legislation, SORIS has, instead, proceeded with the identification of its customers if the same person performs payments for amounts exceeding 15,000 Euros in both single and multiple transactions, which have been conducted over the

last 7 days, as well as the payment instruments that have been used. In fact, cash payments exceeding the limit of 1000 Euros and checks for the same amount that have been issued without the non-transferability clause cannot be accepted. The data collected this way will be recorded in the unique information database and suspicious transactions have to eventually be reported to the Financial Intelligence Unit.

In terms of anti-corruption, SORIS complied with the requirements of the Law 190/2012, regarding the prevention and suppression of both corruption and illegality in the Public Administration, and of the Legislative Decree 33/2013 that, as part of the transparency regulation, requires the fulfillment of a series of publication obligations. These regulations establish that any company—which is controlled by public institutions—shall appoint an anti-corruption and transparency officer (ACTO), to whom appropriate powers and functions must be allocated and recognized in order to guarantee that assignments are conducted with autonomy and effectiveness, respecting the Corruption Prevention Plan (CPP). As a consequence, SORIS has drafted its own Plan, which is annually updated and published on the institutional website, in which an assessment of risks, measures, and strategies that must be implemented to contrast corruption is outlined. This Plan represents the fundamental document both for the implementation of the obligations regarding transparency and for the definition of the corruption prevention strategy that SORIS is pursuing.

The Law 190/2012 refers to a broad concept of corruption, which includes not only the crimes against the Public Administration, but also "bad administration" situations that include every case of relevant deviations of both behaviors and decisions. These deviations vary from the impartial care of the public interest to situations in which private interests improperly influence the administrations or institutions actions. In its ACP, SORIS, as a part of its business model, has specifically identified the following crimes among the circumstances considered relevant for the purposes of the anti-corruption law and regulated in the Penal Code:

- Embezzlement;
- Misappropriation to the detriment of the State;
- Undue receipt of disbursements to the detriment of the State;
- Concussion;
- Corruption for the exercise of the function;
- Corruption to obtain an act contrary to official duties;

- Corruption in legal proceedings;
- Undue induction to deliver or promise benefits;
- Corruption of a person in charge of a public service;
- Instigation to corruption;
- Embezzlement, concussion, undue induction to deliver or promise benefits, corruption, and instigation to corruption of members of the bodies of the European Communities and of officials of the European Communities and of foreign States;
- Office abuse;
- Refusal of official documents and omissions.

In the face of the aforementioned conducts, the risk areas that have been identified within SORIS are shown in Table 12.4.

Table 12.4 Activities at risk of corruption divided by functional area

General management	Management of relations with the tax authority
	Management and control of company data and of the proper functioning of the company
	Other activities carried out by the General Management (with reference to both disputes with the staff and the overall company's management)
Administrative and financial OU	Accountability of collected taxes, reporting and accounting services to shareholders
	Management and control of company data and of the proper functioning of the company
	Management of accounting and financial resources
	Management of the passive cycle (accounting of supplier invoices, collaborators and consultants; visa of conformity, payment of invoices)
	Staff management
	Information updates for transparency
General affairs OU—calls and contracts	Assistance in administrative management
	Management of consumables and inventory
	Purchase of goods and services (motivated measures, IGC, tendering procedures)
	Management of the relationship with lessors
	Management of utilities and maintenance services of the building
	Promotion of contracts development for authorized retailers of vouchers
	Support for sending suspicious activity reports through the INFOSTAT-UIF portal (Legislative Decree 231/2007)
	Information updates for transparency

(continued)

Table 12.4 (continued)

Forced collection and litigation OU	Foreclosure activities, with particular regard to both relations with the collection officers and cash collection activity at the domicile of the foreclosed person
	Management of precautionary measures and interventions in third-party procedures
	Management of relationships with the shareholders in the context of forced collection and fraud recovery activities
	Management of the approved lawyers list for defending in court
IT service management OU	Management of the approved lawyers list for defending in court
	Management of the printing processes and sending of alerts
	Relationships with the outsourcer of the information system
	Management of debtors' personal data
	Updating and integration with the databases of the shareholders for fraud recovery
	Monitoring of the collection process
	Internal administration of the IT system
	Delivery of digital and printed media to the shareholders
	Invoices endorsement for supplies approval
	Processing for Anti-Money Laundering analysis
	Information updates for transparency
Product development and evolution OU	Relationships with the shareholder regarding: planning of activities' workloads; definition of printing models; analysis of both the most problematic taxpayers and of the improvement or activation of new services needs
	Analysis of documents and disputed notifications by taxpayers
	Management of collected sums and related payments to the Bank
	Collection management (general and enforced)
Production OU	Analysis of documents and disputed notifications by taxpayers
	Relations with the public

Source Author's elaboration based on company's data

In terms of RM strategies, the measures to prevent the company's risks are implemented not only through internal and normative regulations, but also through a multilevel approach that is deeply connected with the company's culture. As reported in Table 12.5, it is clear to see how monitored and covered risks in a government-owned company are strictly linked to different managing views, and subsequently, to each one of the three managerial approaches. Moreover, it emerges how not only these approaches have been profoundly studied by the scientific literature, but how they actually characterize the company's life, vision, and activities. For example, the Traditional Approach will typically refer

Table 12.5 Managerial approach and related monitored risks

New Public Management approach	Bruton et al. (2015), Denhardt and Denhardt (2015, pp. 12–22), Koppell (2007), Roper and Schoenberger-Orgad (2011), Ameyaw and Chan (2015), Ke et al. (2010), Lapsley (2009), and Nisar (2007)	SORIS's managers and our offices are having regular meetings, in which topics that are related to quarterly or semi-annual reports are discussed. So, we moved from a hierarchical to a widespread control, improving the coordination beetwen the Municipality and the company, as well as the monitoring of objectives. [Interviewee No. 5]	Operational and financial risk
		Previously the public investee companies had to submit a monthly management report, which has now been replaced by the periodic meetings. In future, we are planning to implement an integrated IT platform that will provide shared informations between the companies and the Municipality. [Interviewee No. 6]	Operational risk
		The structure was really complex, that's why we decided to map all the processes and find the weak areas. The most riskful activities were identified and the first, second and third level of controls implemented. [Interviewee No. 2]	Operational risk
		We have started a consulting service that has been adopted also in other companies. People from other companies came here to understand our model. [Interviewee No. 1]	Operational risk
Public Value approach	Asenova et al. (2015), Briggs (2008), Denhardt and Denhardt (2015), Fletcher and Abbas (2018), Halachmi (2003), Holzmann and Jørgensen (2001), Jørgensen and Bozeman (2002, 2007), Kettl (2002), Mulgan (2000), Osborne (2010), Pollitt and Bouckaert (2011), Romzek et al. (2012), Thompson and Rizova (2015), Woods (2011), Cooper (2012), and Mercer et al. (2005)	We have only two clients, who are also our shareholders. So, services we provide to citizens do not impact on the balance sheet, but, if we make mistakes, we become responsible for damages to the community. [Interviewee No. 4]	System-level risk
		In order to meet the customers' needs we are thinking of a web counter service and a mechanism which is able to validate documents online. We would like to experiment with smart working, which could make possible to reduce travels, pollution and the flow of people coming to our offices. [Interviewee No. 3]	Social and environmental risk
		We receive positive feedbacks from those who are served by our counter service. There is a great effort of the operators to find the best solution for each customer and to manage conflicts. Psychologists helped us to train our operators and to redesign the organization's locals. [Interviewee No. 1]	Social risk
		Talking about local taxes, the fact that paying a tribute you are financing services that you benefit from, it is even easier to understand than the national case. Services are used directly and concretely. So, our role becomes also a sensitization one. [Interviewee No. 5]	Social risk

Table 12.6 The complementary approach: coexistence of different managing views and interests

		Quotations
Complementary approach	Esmark (2017), Hinna et al. (2018), Bruton et al. (2015), Koppell (2007), Roper and Schoenberger-Orgad (2011), and Miller et al. (2008)	While private companies has to enroll theirselves to the Register of Dealers, it was not necessary for us, but this guarantees the possession of managers' adequate moral requirements to the community. [Interviewee No. 4] We must aim at both efficiency and equity in actions, which must be detached from subjects. Otherwise our procedures would become finalized procedures, no more automated ones. Those who fall into the compulsory collection are already at the bottom of a process, which is comparable to an efficiency gap. We need to fill these gaps. [Interviewee No. 2] We are too few to implement a booking system, but we want to serve everyone who enters in our offices. We are convinced that people who come here intend to pay but need to better understand their fiscal position. However, the Municipality does not consider this one as a good practice, because it can put their offices in a bad light. [Interviewee No. 1] The City requires that the rescheduling takes place only if a person has an ISEE of 25.000 euros or less. In future we would like to expand this possibility to everyone that can be exposed to social risks, but, for the moment, we have already started to collaborate with a foundation that provides loans to help people paying their fiscal pendings. [Interviewee No. 3] We have implemented a system that is able to track overpaid taxes and compensate them with other tributes. Even if they represent an objective debt, their refund is not compulsory for the Municipality. In fact, the legal obligation is triggered only after citizens request the money, which would be available at the end of the prescription period. However, citizens usually do not even know that they have paid more taxes than what they had to and the compensation system avoids people to make requests and manage checks. [Interviewee No. 1]

Source Authors' own elaboration

to put constraints on managers' decisional autonomy and to monitor compliance, operational, and financial risks. Instead, in the New Public Management view managers have more strategic autonomy and they usually take care of business-related risks. Finally, in the Public Value approach also system-level risks, such as social and environmental ones, are taken into consideration.

12.5 Conclusion, Limitations, and Further Steps

This paper aimed at shedding light on the central role played by RM strategies and activities in a government-owned company, which speeds up, and in some cases, totally guarantees the achievement of the organization's objectives (Fone and Young 2000). In response to a changed socioeconomic environment, the demand for increased consideration of system-level risks is growing over time. A real-world example, in which the management is particularly careful in taking those risks into consideration, was provided. However, the management and the company's shareholders may have different views and interests, which consequently lead to the need to monitoring different related risks that need to be effectively managed in order to avoid conflict with each other. In fact, on one hand, the company's management can be considered as a pioneer of the Public Value approach, which is getting an increasingly central role in the management of Public Administrations (der Wal et al. 2015). On the other hand, some managers of the owning body are mainly influenced by the traditional PA and/or the NPM ones and do not consider system-level RM as part of the organization's mission. These conflicting views necessarily have to coexist and SORIS's key managers are aware of this, originating what we have called a complementary approach (see Table 12.6).

The authors are deeply convinced that future researches will help to have a better understanding about RM strategies and best practices. The collection of more data and the extension of a similar study to other government-owned companies could permit to perform comparisons between diverse companies, and verify the eventual reproducibility of the adopted organizational, reporting, and decision-making solutions. Finally, future researches will help providing a better knowledge of each of the three approaches linked to the management of Public Administrations and public investee companies, as well as their connections with the creation of public value and democratic, and collaborative governance systems (Jørgensen and Bozeman 2007).

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PART III

Risk Management and Tax Consequences: From "Enhanced Relationship" to "Co-operative Compliance"

Within this interdisciplinary research project on "Risk Management", the legal analysis gives rise to a number of crucial issues.

The present part deals, in particular, with the interaction between the Risk Management and tax law, both from a domestic and comparative perspective. The research focus is on the scheme commonly known as "Co-operative Compliance procedure" and on the consequences that it may have on the internal structure of multinational businesses.

The expression "Co-operative Compliance" refers to a number of schemes that have been implemented by several countries, with the ultimate goal to promote a new paradigm of the relationship between the tax administration and the taxpayer. The core of these schemes is the possibility for the taxpayer to reach an agreement with the tax administration, under which the treatment of facts and circumstances presenting

potential tax risks is regulated in advance. Such a renewed relationship requires an intense and continuous dialogue between the two parties involved, and even the possibility to carry out tax audits beforehand.

In 2013, the OECD released a paper titled "Co-operative Compliance: A Framework" and since then several countries have implemented specific programmes aimed at enhancing the level of cooperation between the taxpayers and the tax administration.

Countries like, The Netherlands and the United Kingdom have a well-established tradition in this field, while others have gone down this road only very recently. Italy passed the Legislative Decree No. 128/2015 and implemented the so-called "adempimento collaborativo" only few years ago.

Moreover, in a *de jure condendo* perspective, in January 2018 the OECD launched a pilot project named "International Cooperative Assurance", which can be considered a "first ambitious attempt" to elaborate on new forms of international cooperative compliance. The ultimate goal of this project is to explore the potential of co-operative compliance programmes that are "tailored for the present globalized economic environment" and are therefore able to go beyond national borders and to involve multiple tax administrations.

The main goal of any instrument falling within concept the Risk Management, either of legal nature or not, is for multinational businesses to reduce tax risks; while for tax administrations to tackle aggressive tax planning. Using a colorful term, one could say that the essence of these instruments is to put in place an exchange of legal certainty *against* a higher level of compliance.

In this part, the reader can find both contributions adopting a general perspective and contributions focusing on particular aspects of this complex topic. The thing that they all have, in common, is the purpose not to just explore the state of art but also to address the future developments.

Mario Grandinetti
Giuseppe Vanz

CHAPTER 13

Tax Risk Management and the Paradox of Cooperative Compliance

Harm van den Broek

13.1 The Need for Tax Risk Management

In the 2018 Torino conference on Risk management, one sub-session was dedicated to tax risk management. This regards tax risks run by companies, but also tax risks run by national governments. In this contribution, the author will discuss one of the new strategies of tax risk management, the so-called system of Cooperative Compliance (CC). In Cooperative Compliance, the relationship between taxpayers and the Tax Administration is in essence based on cooperation and mutual trust, in order to increase certainty about the tax risks and enhanced tax compliance. The author discusses the various initiatives and studies

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H. van den Broek (✉)
Radboud University Nijmegen, Nijmegen, The Netherlands
e-mail: h.vandenbroek@jur.ru.nl

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of the Organization for Economic Co-operation and Development on Cooperative Compliance and its development in the last 15 years. What exactly is Cooperative Compliance? What are the advantages of Cooperative Compliance? What are its risks? And does Cooperative Compliance actually work? This paper will conclude with a short description of future developments of Cooperative Compliance. This paper is to a large extent based on the various studies of the OECD on Cooperative Compliance. In 2017, the OECD issued its report 'Shining Light on the Shadow Economy: Opportunities and Threats'.[1] It is evident that the shadow economy, also referred to as 'underground economy', or 'informal economy' is, by definition, difficult to measure. But estimates of its size vary from under 1% of the Gross Domestic Product (GDP) in some countries to over 20% in others.

In addition to less revenue being collected to fund public services, the shadow economy has other wider negative effects which can magnify its economic and social impact. States run a significant tax compliance risk that needs to be addressed. The traditional way of dealing with these risks, is performing ex post tax audits, in which the Tax Administration examines whether the tax declarations that taxpayers have filed are in line with the law and whether any form of tax fraud has been committed. In case of any mistakes in the tax declarations, the Tax Administration will impose penalties. In case of more serious infringements, it may lead to criminal persecution in court.

13.2 Taxpayer Attitudes

At present, Tax Administrations use a variety of strategies to shrink the shadow economy and to improve tax compliance. In modern tax risk management and in the choice which strategy to apply to improve tax compliance, more and more, the attitude of taxpayers plays an important role. The European Commission's 2010 Compliance Risk Management Guide[2] distinguishes four interconnected areas of tax compliance: registration, filing, reporting and payment of taxes.

There are different motives and conditions that can result in tax (non) compliance. Economic models of tax behaviour assume that people

[1] Shining Light on the Shadow Economy: Opportunities and Threats, OECD 2017.

[2] Compliance Risk Management Guide for Tax Administrations, European Commission 2010, p. 12.

weigh the expected profits of evasion against the (perceived) chances of getting caught and the penalties imposed when evasion is being detected. These economic models are an important basis for policies developed by many revenue bodies to stimulate compliance and reduce tax evasion. However, the OECD report assumes that the tax risks associated with large business taxpayers generally do not involve (illegal) tax evasion. They may rather be involved in aggressive tax planning: perfectly legal but perhaps not in line with the spirit of the law in order to minimize tax liabilities.

Furthermore, the OECD report indicates, based on literature, that with regard to strategies to influence the behavior of taxpayers, strategies based on Cooperative Compliance (CC) are to be preferred to those that rely on coercion alone.[3] In recent years, risk management (RM) has significantly developed and evolved into a systematic process in which choices are made within a broad range of compliance tools. On the one hand, these tools are designed to stimulate voluntary compliance and on the other hand to prevent non-compliance.

In practice, more and more, Tax Administrations are introducing operational strategies that create a balance between traditional enforcement activities and more innovative treatments that offer more effective ways to arrive at high levels of compliance. A modern compliance strategy focuses on giving each taxpayer category the appropriate attention. Compliant behaviour requires support, while non-compliant behaviour may, depending on the cause, require severe action.

For example, the Tax Administration of Singapore (IRAS) chooses its compliance strategies according to the behaviour of specific taxpayers.[4] It distinguishes 4 types of taxpayers:

- *Voluntarily Compliant taxpayers*—taxpayers who are voluntarily compliant: those who fully comply with their tax obligations without further intervention by the Tax Administration.
- *Unaware taxpayers*—taxpayers who want to comply with their tax obligations, but are unable to do so due to a lack of knowledge and understanding of their obligations.

[3] Co-operative Compliance: A Framework. From Enhanced Relationship to Co-operative Compliance, OECD 2013, p. 44.

[4] Shining Light on the Shadow Economy: Opportunities and Threats, OECD 2017, pp. 12–13.

- *Negligent taxpayers*—taxpayers who are willing to comply, but who do not allocate sufficient attention and resources to their tax obligations.
- *Errant taxpayers*—taxpayers who intentionally commit fraud and evade taxes.

Also, Australia distinguishes four similar types of taxpayers on the basis of a risk assessment. Australia's RM strategy can be summarized as follows: good intentions are encouraged, bad willing taxpayers should be deterred.

13.3 Diversification of Risk Management Strategies

Generally speaking, OECD Member States are promoting better compliance through different strategies. These strategies are based on 3 main pillars.[5]

13.3.1 Taxpayer Education and Simplicity of Compliance

The OECD is convinced that compliance can be enhanced where legal and administrative liabilities are relatively easy to comply with, and where there is advice and support available for small business.

The starting point is making registration and the payment of tax easier. For example, in Denmark, all businesses and individuals receive digital post from all public authorities in one mailbox, provided by the government on a secure public platform. All private information from tax to health data must be sent through this channel. Individuals and business are obliged to open their secure mailbox.

Furthermore, many Tax Authorities are trying to use the channels of communication that are easiest for taxpayers. In Ireland, The Tax Administration runs a telephone service in order to provide information to taxpayers. When taxpayers call this number, call waiting times have reduced from over 5 minutes in 2014, to less than a minute in 2016. Various countries, like Australia, Chile, Peru and the UK have launched mobile apps to support individuals or small businesses with various tools and tax information. Australia introduced a myDeductions tool to the

[5] Shining Light on the Shadow Economy: Opportunities and Threats, OECD 2017, pp. 26–45.

app. Taxpayers can use the camera on their phone to take pictures of receipts or of other work-related expenses and upload these deductions to their digital tax return. Peru and Australia also introduced the functionality to report tax evaders.

These measures concerning taxpayer education and simplicity of compliance encourage and facilitate in particular goodwilling taxpayers.

13.3.2 Reducing the Opportunities and Increasing Detection

Shadow economy activities, by definition, cannot take place where they are visible to Tax Administrations. New tools are making it possible to detect these activities by using different sources and combining information automatically. This regards:

- Use of available data. Russia, for example, introduced the obligation to file all VAT (Value Added Tax) tax returns in a digital form. In that way deductions of VAT and declarations of VAT could be matched. In 2014 this resulted in 16.8% of increase in VAT collected.[6]
- Advanced analytics of those data helps to set priorities.
- Technology is used to reduce ID fraud and reporting fraud, including digital fingerprints and iris scans.
- Whole of government approaches: more exchange of information between different government agencies, for example, social security agencies and tax agencies.
- International cooperation: exchange of information through tax treaties and the Multilateral convention on mutual administrative assistance in tax matters.

13.3.3 Reinforcing Social Norms

The third pillar consists of reinforcing social norms. Imposing penalties can be effective in changing behaviour. Most Tax Administrations also try to influence social norms, by educational projects that explain citizens how much tax is lost by tax evasion, and by voluntary disclosure programmes for taxpayers who wish to bring their position back in line with the law.

[6] Shining Light on the Shadow Economy: Opportunities and Threats, OECD 2017, p. 31.

13.4 Cooperative Compliance

One of the new strategies of Tax Administrations to increase the compliance of taxpayers with the law is the concept of so-called Cooperative Compliance, or CC. The expression 'cooperative compliance' seems paradoxical: taxpayers that are willing to cooperate in the compliance of their obligations under tax laws. This seems in contradiction to the fact that, according to certain estimates, up to 20% of the potential tax revenue is lost as a result of tax evasion. In addition, it is not uncommon that taxpayers decide to make use of potential loopholes in a tax system or between the tax systems of various states. Of course, it must be acknowledged that this is only part of the reality. In fact, most of the taxpayers do no evade taxes and many companies are not involved in tax-avoiding practices. Apart from ethical considerations of management boards, this is also a matter of companies managing their tax risks.

So what is CC? As indicated in the 2008 OECD Report,[7] CC is a relationship between taxpayers and the Tax Administration based on cooperation and mutual trust, with both parties going beyond their statutory obligations. One could define CC as a way of voluntarily chosen cooperation between a taxpayer and a Tax Administration which is based on mutual trust and transparency, and which goes in that respect beyond statutory obligations, with the aim to assure that the taxpayer is compliant with existing tax laws in exchange for receiving early certainty in tax manners and a problem-solving attitude from the Tax Administration.

On the one hand, the aim of the cooperation is to assure that the amount of tax to be paid is fully in line with the law: it is referred to as CC. On the other hand, the way of working goes beyond the law: taxpayers are transparent and provide more information to the Tax Authorities about their activities and strategies than the law may require. In exchange, the Tax Administration is service-minded: it provides early certainty in uncertain tax manners and it generally will demonstrate a problem-solving attitude. In the early days of CC, in the Netherlands, in order to emphasize the service-minded attitude of the Tax Administration, taxpayers were officially referred to as 'clients', and tax inspectors as 'client coordinator'.

[7] Study into the Role of Tax Intermediaries, OECD 2008, p. 5.

13.5 The OECD View on CC

13.5.1 The 2008 Study into the Role of Tax Intermediaries

As illustrated by Prof. Ronald Russo in his conference paper,[8] Australia, the UK and the Netherlands were among the first countries to introduce a system of CC about 15 years ago. Simultaneously, in 2002, the OECD Committee on Fiscal Affairs has created the Forum on Tax Administration (FTA). The main aim of the FTA is to improve taxpayer services and tax compliance—by helping Tax Authorities increase the efficiency, effectiveness and fairness of tax administration and reduce the costs of compliance. Twenty-six OECD countries participate in this network, including Italy.

In 2008, the OECD FTA published its 'Study into the Role of Tax Intermediaries', tax advisers. This report addresses the experiences in various states with CC and evaluates the CC approach. The Study concluded that all tax authorities need to robust their strategies in the area of combatting aggressive tax planning. It acknowledged that there is significant scope to influence the demand for aggressive tax planning in relation to large corporate taxpayers.[9]

13.5.2 The Seven Pillars of Cooperative Compliance

13.5.2.1 Introduction

For the purposes of the Study into the Role of Tax Intermediaries, business and tax advisers were consulted for their views on what they need to see from Tax Administrations. In addition, it was examined what Tax Administrations need from taxpayers. The consistent response was that large corporate taxpayers want early certainty and a problem-solving attitude from the Tax Administration. The Study indicated that, in order to encourage tax compliance of taxpayers, Tax Administrations

[8] Prof. Dr. Ronald Russo, Risk management, internal control and CC in taxation, Conference Paper on behalf of the *Second Risk Management International Conference* of the Department of Management, Università degli Studi di Torino, on 25–26 October 2018.

[9] Study into the Role of Tax Intermediaries, OECD 2008, p. 5.

need to operate using the following five attributes when dealing with all taxpayers[10]:

- understanding based on commercial awareness;
- impartiality;
- proportionality;
- openness (disclosure and transparency);
- responsiveness.

Hereafter, I will discuss what these five attributes should mean in the view of the OECD Study. After that, I will discuss the two attributes that taxpayers should have in CC.

13.5.2.2 Understanding Based on Commercial Awareness

In the first place, Tax Administrations need to be able to understand the context within which a company's normal tax planning takes place. Without an understanding of the commercial drivers, there is the potential for Tax Administrations to misunderstand the broader context of an activity or transaction. This may result in costly disputes and uncertainty. Therefore, Tax Administrations need to understand the 'art of how to do business'. They should understand the broad context within which large corporate taxpayers operate. Also, Tax Administrations need to understand the characteristics of the industry sector in which a particular taxpayer operates. And finally, Tax Administrations need to understand the unique characteristics of the particular taxpayer's business.

13.5.2.3 Impartiality

Tax Administrations need to bring a high level of consistency and objectivity to issue resolution. This regards their overall approach. Resolving tax problems should be focused on the right amount of tax, not on maximizing the amount of tax receipts.

Let me give one example of a taxpayer friendly approach that I appreciate very much. If in the Netherlands, an individual taxpayer is entitled to a refund of Income Tax, according to the law, he must claim this within 3 years. After that, the claim expires and can be rejected. The

[10] Study into the Role of Tax Intermediaries, OECD 2008, pp. 33–38.

Netherlands Tax Administration, however, applies the generous policy to grant such refund as long as it is claimed within 5 years. Evidently, applying such approach the Tax Administration creates goodwill among taxpayers.

13.5.2.4 Proportionality

According to the 2008 Study, the way in which Tax Administrations deal with taxpayers, in particular with regard to tax audits, needs to be reasonable, balanced and proportionate. This concerns the choices that Tax Administrations make, deciding which taxpayers, which tax returns and which tax issues to give priority and how to respond appropriately.

Tax inspectors should have the skill to decide what not to ask about and when to stop an audit that is unlikely to lead to relevant results. Tax inspectors should take into account the characteristics of the specific taxpayer, the relationship between the Tax Administration and the taxpayer, and the potential benefits of pursuing or not pursuing a certain audit. For example, past experience of adjustments on a particular taxpayer's tax returns can justify further audits of that taxpayer's tax returns. By contrast, a history of finding no such adjustments would indicate that it is less necessary to invest in further audits.

Further suggestions of the Study[11] for tax inspectors:

- to focus attention on significant issues and only where there are sufficient reasons for doing so;
- only to ask appropriately focused questions;
- to complete audits quickly when the audit is done;
- when processes break down, to discuss the reasons and the remedial action that is necessary;
- to encourage voluntary compliance and help taxpayers learn from errors; and
- to discuss the implications of decisions before taking them.

13.5.2.5 Openness (Disclosure and Transparency)

Taxpayers furthermore wish to see openness and transparency from Tax Administrations. Generally, the Study sees greater openness as an important element in building mutual trust. It mentions some examples. First,

[11] Study into the Role of Tax Intermediaries, OECD 2008, p. 36.

rulings can provide taxpayers with disclosure and transparency on the tax consequences of particular transactions or issues. The Study advises countries to further develop such ruling mechanisms that provide taxpayers with early certainty. Second, taxpayers want to know more about how Tax Administrations approach to RM, at three levels:

- what is the broad approach to RM: what are types of behaviours or transactions the revenue body sees as risks and how will it respond to them?
- what are the mechanisms to select taxpayers or issues for audit?
- what is the Tax Administrations risk assessment of a particular taxpayer? Some Tax Administrations have seen benefits from discussing with the taxpayer how the assessment has been reached and to what actions it leads from the Tax Administration.

13.5.2.6 Responsiveness

What large corporate taxpayers most want in relation to tax is early certainty. And they want it quickly. Tax Administrations, therefore, need to be responsive. Taxpayers should receive quick, efficient and professional answers when they present questions to Tax Administrations. Furthermore, if there are any issues or problems, taxpayers can expect a fair and efficient decision-making process and definitive resolution.

13.5.2.7 Disclosure of Information

In an approach of CC, in exchange for the cooperative approach of Tax Administrations, taxpayers are expected to demonstrate an attitude of Disclosure and Transparency.[12]

The Disclosure of information that Tax Administrations expect from taxpayers goes beyond the information taxpayers are already obliged to provide by law. It will include any information necessary for the revenue body to undertake a fully informed risk assessment. Disclosure of information includes any transaction or position where there is a material degree of tax uncertainty or unpredictability and potential differences in interpretation. This information must be provided not only on request but also spontaneously. Evidently, this is crucial for the detection of aggressive tax planning structures.

[12] Study into the Role of Tax Intermediaries, OECD 2008, p. 41.

Generally, under national laws, companies are obliged to provide information that is directly relevant for assessing the company's tax declaration, for example about turnover, employees and costs. Under CC also strategic information may be asked by the Tax Administration. This could regard legal advice about tax structures, even if this advice is protected by professional privileges of lawyers or tax advisors. The commitment of taxpayers to disclose information, therefore, goes beyond their legal obligations.

13.5.2.8 Transparency

The OECD considers Transparency as the framework within which individual acts of disclosure of information take place. It regards the manner in which taxpayers and Tax Administration approach tax issues which give rise to a material degree of risk or uncertainty. In this respect it is important to:

- build and maintain individual relationships between taxpayers and tax inspectors. A certain degree of continuity of persons is necessary to reach mutual trust and respect;
- create a culture in which trust is developed between parties;
- agree on an accessible way to exchange information between taxpayer and Tax Administration, for example, regular meetings or discussions only when necessary.

Interim Conclusions

If we look at the first five characteristics, it is clear that CC asks very much from the attitude and approach of Tax Administrations. But if revenue bodies demonstrate these five attributes, the OECD has the belief that this should encourage large corporate taxpayers to engage in a relationship with revenue bodies based on cooperation and trust. The belief is that CC has the potential to reduce the demand from large corporate taxpayers for aggressive tax planning. Obviously, it will not disappear completely. Therefore, Tax Administrations need to have effective risk-management processes in place.

Large corporate taxpayers must, therefore, volunteer information where they see a potential for significant differences of interpretation. They must also provide comprehensive responses to any questions, so that the Tax Administration can reach the right tax conclusions.

13.6 Expectations About Benefits

13.6.1 Business' Expectations

Why does business commit itself to CC? A 2013 survey of the OECD[13] demonstrates that business expects the following benefits from CC:

- An enhanced relationship: a relationship with the Tax Administration based on justified trust, mutual understanding, openness and transparency;
- Reputation: meeting public's expectations of legitimacy and fairness;
- Risk management: the ability to better manage tax risks and predict what the Tax Administration's position will be in relation to tax issues; but also an approach by the Tax Administration based on a better understanding of the business and a recognition of the distinction between business-driven and tax-driven decisions;
- The opportunity to highlight problems with the tax code or its administration;
- Certainty in advance: working in real time, decreased uncertainty about tax positions, faster resolution of issues, reduced need for lengthy litigation;
- Reduction of administrative burdens: reduced compliance costs resulting from less audits from the Tax Administration.

It is interesting to see that business does not expect having to pay less taxes.

13.6.2 Tax Administrations' Expectations

The same survey[14] demonstrates that Tax Administrations implement CC models to achieve improved taxpayer compliance behaviour. Tax Administrations expect in part similar benefits as business expects:

[13] Co-operative Compliance: A Framework. From Enhanced Relationship to Co-operative Compliance, OECD 2013, p. 35.

[14] Co-operative Compliance: A Framework. From Enhanced Relationship to Co-operative Compliance, OECD 2013, pp. 34–35.

- An enhanced relationship: a better relationship with business based on justified trust; a change of behaviour in terms of the nature and scale of tax avoidance/planning;
- Understanding the business: increased commercial awareness of tax officials; the ability to better predict what the position of a business will be in tax issues;
- Risk management: being able to address emerging risks sooner, improved risk assessing, direct access to board-level managers and tax managers of companies, and a tougher approach towards non-compliance;
- Certainty in advance about tax issues and also in relation to forecasting the tax yield;
- Reduction of administrative burdens: more compliance, accurate and timely filing of tax returns and timely payments, reduced administrative costs and an overall increase in the amount of tax paid on time without dispute;
- Improved real-time information about commercial developments;
- Better use of revenue body resources;
- Improved confidence in the tax system and revenue bodies' and businesses' fair play.

13.7 Mechanisms and Steps for the Introduction of Cooperative Compliance

Regarding the various formats for a CC regime, the 2013 OECD Report[15] indicates that in practice, most states apply the mechanism of agreements between taxpayers and Tax Administrations. These formal or informal agreements can be tailored to suit the specific needs of taxpayers and can include how parties intend to work and how the agreement could be terminated. Other possible mechanisms could be a unilateral statement by the Tax Administration, to which taxpayers can decide to adhere, or a charter adopted jointly by or on behalf of all stakeholders.

The OECD[16] also recommends three steps to be taken in each particular case. First, a statement of intent of the taxpayer and the Tax Administration to apply CC, and for what years. Second, an assessment

[15] Study into the Role of Tax Intermediaries, OECD 2008, p. 43.

[16] Study into the Role of Tax Intermediaries, OECD 2008, p. 43.

of the capability of both taxpayers and the Tax Administration. Is the staff properly trained? Is the taxpayer in control of its tax processes? And three, endorsement at high level is necessary, in order to guarantee the continuation of the mechanism.

13.8 Experiences with Cooperative Compliance

13.8.1 Study into the Role of Tax Intermediaries (2008)

The 2008 Study into the Role of Tax Intermediaries describes the first pilot projects of CC as positive and promising. In 2005, Ireland, the USA and the Netherlands started their first experiences in CC with large, mostly but not exclusively low-risk companies.

Irish tax officials saw a positive impact on compliance behaviour. There was an increasing number of requests for assistance and interpretation from the large taxpayers engaged. Also, an increasing number of voluntary disclosures and expressions of doubt was noticed. In the United States, the number of participating large taxpayers increased from 17 in 2005 to 73 in 2007. The resolution of unresolved problems had accelerated and the tax risks were mitigated. Also, the 2007 evaluation in the Netherlands was very positive. Some of the large companies mentioned in their public annual accounts the conclusion of a supervision agreement. The aim for 2008 was to include in CC 60% of all the large companies.

13.8.2 Cooperative Compliance: A Framework (2013)

13.8.2.1 Introduction

In 2013, a new OECD report was published, now with experiences of 24 countries. Of those, 14 States had formally adopted a CC model, 5 states were applying a pilot project. This increase in numbers in five years' time is remarkable and emphasizes the value of CC approaches and its framework as laid down in previous studies. Countries found it particularly important that the Tax Administration, in its approach, demonstrates impartiality and responsiveness.

13.8.2.2 Common Features and Challenges

The 2013 report notices some common features of the various systems of CC of the states involved:

- All CC approaches operate within the boundaries of law and Regulations. Countries have mostly not needed to change existing laws. At this stage it is worth mentioning that Italy introduced a statutory CC system in 2015;
- In most countries the CC approach is only offered to a specific class of taxpayers, generally large companies. Only the Netherlands applied CC to both large and small businesses;
- Taxpayers in most countries can apply to enter into CC; in Singapore large corporate taxpayers have to be invited by the Tax Administration;
- Some countries explicitly exclude high-risk taxpayers from this regime.

The Report also mentions various challenges that Tax Administrations are facing:

- Communicating about the impact of the programme on taxpayers: it is important to communicate that CC should not result in increased audit attention from the Tax Administration, nor in less attention and support when taxpayers have the 'low risk' status;
- Addressing cultural issues: CC programmes require changes in culture and behaviour both for revenue bodies and for business. This requires proper training of the staff;
- Maintaining the level of contact which is necessary to obtain success requires commitment from both sides, of time and resources in the initial stages, but also when the programme is running.

13.8.2.3 Key Issues

Between the two studies of 2008 and 2013, some key issues or concerns about CC have emerged. I will discuss them hereafter.

Cooperative Compliance as Part of a Tax Compliance Strategy[17]

In order to be successful, it is important that CC is not applied on a stand-alone basis, but is part of a well-developed tax compliance strategy which distinguishes various risk categories of taxpayers. The overall

[17] Co-operative Compliance: A Framework. From Enhanced Relationship to Co-operative Compliance, OECD 2013, pp. 41–44.

approach could be summarized as 'cooperation if possible and enforcement if necessary'.

Cooperative Compliance and Equality Before the Law[18]

A very important question is whether CC is in line with the principle of equality as laid down in the Constitutions of most states. In literature, questions have been raised in this regard. If some businesses are enjoying a relationship of CC and the associated benefits, are the remainders being discriminated against?

Equality requires that citizens in the same situation should be treated in the same way and that any differences of treatment should be the rational result of objective differences in the circumstances of the cases in question. So equality before the law does not mean that everyone is treated the same, but it does require different treatment to be justified.

In this regard, it should be emphasized that CC is not intended to achieve a different, favourable tax outcome for the taxpayer, paying less taxes. It has been developed as a more effective way of achieving compliance with the existing tax laws. Therefore, according to the OECD view on CC, this should not result in inequality before the law.

Of course, it is always necessary to monitor to what extent this is reality. It is common knowledge that the European Commission has started State Aid procedures against various states, concerning tax rulings with taxpayers that were considered as sweetheart deals in order to convince large companies to establish themselves in the states involved. In the evaluation of the effectiveness of CC, this risk should also be assessed, and various states do so.

As a second point, it must be acknowledged that taxpayers that participate in CC programmes do obtain collateral benefits, and that is actually the reason that large companies participate in these programmes: early certainty on tax positions and a reduction of compliance costs. Can it be justified that these advantages are only available to some taxpayers?

CC requires taxpayers to offer disclosure and transparency. The taxpayer must provide *all* the information that a Tax Administration needs to carry out a fully informed risk assessment, even beyond the information which is required by law. Furthermore, the taxpayer must have in place systems of internal control that ensure that the tax returns

[18] Co-operative Compliance: A Framework. From Enhanced Relationship to Co-operative Compliance, OECD 2013, pp. 45–48.

submitted are accurate and that transactions or positions giving rise to material tax uncertainty are disclosed. This is referred to as the Tax Control Framework (TCF). The OECD holds that the existence of an effective TCF, coupled with a taxpayer's disclosure and transparency, provide an objective and rational basis for different treatment: such taxpayers are low risk. Therefore, the OECD considers CC consistent with the principle of equality.

Cooperative Compliance and the Spirit of the Law[19]

The following important question is whether companies participating in CC should only comply with the letter of the law, or also with the spirit of the law.

Companies that are involved in aggressive tax planning[20] do not break the law, but make use of loopholes in the tax system. In the 2011 OECD Guidelines for multinational companies,[21] the OECD explicitly expects that taxpayers would not only comply with the letter, but also with the spirit of the law:

> (…) enterprises should comply with both the letter and spirit of the tax laws and regulations of the countries in which they operate. (…) Transactions should not be structured in a way that will have tax results that are inconsistent with the underlying economic consequences of the transaction (…)

Certain scholars, as well as business, feared that this reference to the spirit of the law could give rise to a degree of overcompliance by businesses. Is this fear justified? The 2013 Report holds that 'the complexity of modern business operations and tax codes is such that there is scope for legitimate differences of opinion about what constitutes aggressive tax planning and which tax outcome is truly consistent with the spirit of the law'. Ultimately—the Report concludes—it is for the courts to

[19] Co-operative Compliance: A Framework. From Enhanced Relationship to Co-operative Compliance, OECD 2013, pp. 48–50.

[20] Aggressive tax planning can be defined as: 'Planning involving a tax position that is tenable but has unintended and unexpected tax revenue consequences. Taking a tax position that is favourable to the taxpayer without openly disclosing that there is uncertainty whether significant matters in the tax return accord with the law' (From: A Framework for a Voluntary Code of Conduct for Banks and Revenue Bodies, OECD 2010).

[21] Guidelines for Multinational Enterprises, OECD 2011, p. 60.

decide how the legislation should be applied to the particular facts of a case if the parties cannot agree. CC does allow for such differences of opinion and for access to the courts to settle those differences if necessary. CC does, therefore, not require overcompliance by companies. On the other hand, it must also be noted that full transparency of companies provides Tax Administrations information which is useful to combat structures of tax avoidance which are potentially not fully compliant with tax laws.

Managing Disputes Within Cooperative Compliance[22]

The willingness to resolve the dispute as soon as possible is the reason why it is possible to resolve disputes quicker in a cooperative relationship, so the OECD holds. In principle, courts are open to settle these disputes. But also alternative dispute resolution (ADR) techniques can be used, such as mediation or arbitration. Whether this is an option depends on the culture and laws of the states involved. In order to fulfill the principle of equal treatment, it is of great importance that there are no differences in terms of equal judgment and treatment inside and outside CC.

13.9 The Importance of Tax Control Frameworks

A company can only provide guarantees to the Tax Administration regarding the accuracy of its tax declarations and its transparency on potential differences of interpretation of tax risks, if it is fully in control of the tax consequences of all processes and transactions within the enterprise. Therefore, being in control is a requirement that all states impose on companies as a condition to participate in CC: companies should have a so-called TCF. A 'Tax Control Framework' (TCF), can be defined as the internal control of all processes and transactions with possible tax consequences.[23] The requirement to be 'in control' regards all tax issues and means to be able to detect, document and report any relevant tax risks to the Tax Administration in a timely way.

[22] Co-operative Compliance: A Framework. From Enhanced Relationship to Co-operative Compliance, OECD 2013, pp. 50–53.

[23] Co-operative Compliance: A Framework. From Enhanced Relationship to Co-operative Compliance, OECD 2013, p. 59.

Also, the OECD Guidelines for responsible business conduct of multinational companies expect of Corporate boards to adopt tax risk management strategies to ensure that the financial, regulatory and reputational risks, including tax risks, are fully identified and evaluated. Many multinational companies already comply with these Guidelines and therefore dispose of such TCF. This is not the case, however, for smaller and medium-sized companies. For that reason, in most states, they have no access to CC regimes.

How such TCF should look like, is generally not laid down in national legislation. COSO, the Committee of Sponsoring Organisations of the Treadway Commission,[24] has drafted a Model Tax Control Framework that companies can apply. Companies have to adapt such a model to the specifics of their own business. From some evaluations[25] emerges, that still too many uncertainties about the design and assessment of tax control frameworks exist. Tax Administrations need to provide guidelines for business.

In designing a TCF, the OECD holds it necessary to distinguish various aspects:

- Enterprise: divide the overall tax risk into more manageable pieces; by country, by legal entity or by departments and functions.
- Tax: approach the problem from the perspective of different tax types (e.g. VAT or Income Tax).
- Risks: examining the biggest known risks.

The purpose is to provide a verifiable assurance that tax risks will not arise because of a lack of control and a poor understanding of the tax risks on the part of the enterprise itself. If the TCF is effective,[26] the Tax

[24] COSO is a voluntary private sector organisation dedicated to improving the quality of financial reporting through business ethics, effective internal controls and corporate governance.

[25] For example from the 2012 Government Committee's review in the Netherlands.

[26] The question whether a TCF is effective, has several aspects: (a) detection of tax related risks and opportunities; (b) disclosure of tax related risks and opportunities; (c) preventing tax related errors; (d) detection and correction of errors; and (e) the learning cycle; errors need to be followed by actions to improve the TCF. Companies will need to continuously assess the effectiveness of their TCF and learn from its shortcomings. This is essential information for the Tax Administration. When the monitoring of the taxpayer is transparent to, and viewed as effective by the revenue body, the extent of reviews and audits conducted by the revenue body itself can be reduced significantly.

Administration can rely on tax returns submitted by the company and be confident that tax issues of doubt or difficulty will be brought to its attention.

13.10 How Can Tax Administrations Control the Process of Cooperative Compliance?[27]

An important question is whether CC could affect the impartiality of the tax inspectors involved. In CC, tax officials are expected to combine two roles: maintain an open relationship with the taxpayer but also remain impartial and professional and retain a critical attitude towards the taxpayer, the information and tax risks it discloses.

According to the OECD, there is a concern that tax officials may be less inclined to challenge aggressive tax positions if they feel this may damage the overall functions of a cooperative relationship with the taxpayer. Furthermore, non-professional relationships may increase the risk of corruption. On the other hand, there is the concern that the taxpayer may be put at a competitive disadvantage if, in the interests of a good relationship with revenue bodies, it refrains from tax planning that other large businesses continue to use effectively. It is, therefore, important to ensure that the Tax Administration continues to deal with taxpayers in a way that ensures an equality of outcomes.

Internal Governance arrangements are crucial for Tax Administrations. These aspects and risks of CC must be managed, and in practice all states applying CC do so. Various measures can be distinguished:

- Integrity rules and core values, and formal rules for filing and documentation of CC processes. These measures make tax officials aware of the ethical rules and expectations of the Tax Administration.
- Standard working programmes and operating Systems and written guides contribute to an unambiguous and predictable way of working and support the officers of the Tax Administration.
- The involvement of a second (or even more) pair(s) of eyes should ensure that decisions regarding large taxpayers are not made by a single individual.

[27] Co-operative Compliance: A Framework. From Enhanced Relationship to Co-operative Compliance, OECD 2013, pp. 65–71.

- Training programmes and regular contact between CC experts enable tax officers to learn together and to learn from each other: social and communication skills; knowledge about tax control frameworks; practical dilemmas and best practices.
- Rotation systems of tax officials, after, for example, 4 or 5 years.
- Review and monitoring systems to measure the quality of the work that is done on an ongoing basis.

These measures should provide added assurance that the process is impartial and delivers consistent outcomes, and the OECD recommends that countries consider all six measures.

13.11 Evaluating the Value of Cooperative Compliance

13.11.1 How to Measure the Success of Cooperative Compliance

The question must be raised whether and to what extent CC actually contributes to a higher level of tax compliance and a higher level of assurance that the correct tax is being paid.

How should we measure that?

Establishing good quality metrics is still a challenge. Traditional measures for the audit work of Tax Administrations are output focused. They generally measure results of correcting non-compliance. Roughly speaking one could say: the more adjustments the Tax Administration makes to a tax return, the better. This way of measuring the quality of the Audit work is not adequate in respect of CC. CC does not aim at correcting non-compliance, but at preventing it. The vast majority of Tax Administrations that were surveyed in 2013 were in the process of developing new indicators that are designed to assess the added value of CC. The evaluation of the CC regime in the Netherlands concluded that it was impossible to say whether the project had been successful, since the success rate could not be measured.

13.11.2 Costs of Cooperative Compliance for Tax Administrations

In general, the experience is that the move to a CC model did not necessarily lead to an increase in the total resource devoted by the Tax

Administration to the management of the large business segment. Research of the OECD suggests that efficiency under CC has either improved or at least has not degraded.

13.11.3 Indicators for Measuring Effectiveness

Despite the difficulties encountered, Tax Administrations try to measure the effectiveness of the CC strategy. The United Kingdom, for example, uses as key indicators: maximizing revenue, customer experience and cost reduction. The OECD notices that experience demonstrates that CC can deliver certain measurable improvements in terms of the improved efficiency of the process:

- such as reduced time to resolve issues;
- reduced costs.

Furthermore, in various states, substantial legacies of old open issues have been settled and taxes due as a result have been collected. However, with respect to 'effect or outcome indicators' most countries are at an early stage in developing a measure (or measures) that focuses on improved outcomes.

What the OECD in the first place proposes is an approach that focuses on the degree to which voluntary compliance has improved, rather than amounts of non-compliance that was detected. All taxpayers who have entered into a cooperative relationship and met the necessary standard of tax control represent that proportion of the tax base that is assured as accurate. That is a measurable number. And as the numbers of taxpayers who are involved in CC grows, so does the proportion of the tax base that is assured. That can be measured as a year on year improvement and is a forward-looking measure. It is according to the OECD, therefore, a good guide to the progress being made towards the ideal state, in which all large corporate taxpayers demonstrate the desired standards of transparency, disclosure and tax control. Over time the increased participation in CC should result in a reduction in the tax gap.

In the second place, also in the context of CC, uncertainties and differences of opinion about the tax treatment of certain transactions will arise. In such cases, the aspects of the tax return that gives rise to a difference of opinion are explicitly identified. As a result, the quantum of

uncertainty about the tax liability is identified. The tax at risk as a consequence is a known quantity.

Measures of the effectiveness of a CC strategy should include data about dealing with such disputes: the time taken to reach resolution; the results of that resolution in terms of the additional tax arising, or the reduction of tax. With these data, it is also possible to see in which parts of the tax system issues are arising, how much in aggregate appears to be at stake and how long on average the issue has been working across the whole population of large businesses. This approach is used in the United Kingdom. This information can be represented as a chart with data.[28] Together with the metrics that countries have already developed, the measure of the degree to which the tax base has been assured, coupled with the measure of the value of uncertain tax positions, can be used to assess the effectiveness and efficiency of CC.

Apart from these quantitative benefits, some of the benefits for both Tax Administrations and taxpayers that can be expected from CC, are not quantitative but qualitative in nature. I have discussed them before.

13.12 The Future of Cooperative Compliance

In 2018, the OECD presented its Handbook for a new multilateral CC pilot project focusing on multinational companies. Under this pilot project, the Tax Administrations of the various countries in which a multinational company is active will assess jointly and together with the multinational companies the tax risks of such multinational in respect of transfer pricing and foreign branches. At the end, each Tax Administration involved will issue a non-legally binding letter in which it declares the level of risk that has been observed. It is clear that the Institute of CC will continue to develop and expand in the near future.

[28] See for example Fig. 6.2, Co-operative Compliance: A Framework. From Enhanced Relationship to Co-operative Compliance, OECD 2013, p. 79.

CHAPTER 14

Risk Management, Internal Control and Cooperative Compliance in Taxation

Ronald Russo

14.1 General Introduction

In recent years more and more jurisdictions (through their Tax Authorities) have entered into some form of cooperative compliance (CC) with (key) taxpayers. Risk management (RM) and internal control usually form the basis for this kind of supervision. In general, Enterprise Risk management (ERM) involves those elements of the governance and management process that enable management to make informed risk-based decisions. Informed risk responses, including the internal controls that accompany them, are designed to reduce the risk associated with achieving organizational objectives to be within the organization's risk appetite. Therefore, ERM/internal control and the objective of achieving the organization's strategic goals are mutually dependent.[1]

[1]Definition from: Improving organizational performance and governance: how the COSO framework can help, executive summary, see https://www.coso.org/Documents/2014-2-10-COSO-Thought-Paper.pdf.

R. Russo (✉)
Tilburg University, Tilburg, The Netherlands
e-mail: r.russo@tilburguniversity.edu

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Corporate governance rules generally identify RM and internal control as indispensable instruments for good governance and as a consequence, other governmental supervisors than Tax Authorities (for instance of financial accounts or banking regulations) also look at these instruments. I will refer to governmental agencies with (among others) a supervising role as 'supervisors'. As a result, RM and internal control attract a lot of attention in general, and also in the field of taxation.

Early adapters of CC have been the Netherlands, Australia and the UK, but now many others have followed or are planning to do so (for instance Germany, Italy, Singapore). The programs differ widely in application and (legal) form. In some ways, the countries that implemented later are further in their development than the early adapters. In this paper, I will view the role of RM and internal control in the concept of CC and look into possible developments and the consequences for taxation. I will look from the perspective of tax authorities as well as companies.

I will start by looking at the role of RM and internal control in corporate governance, specifically for taxation. Then, after a general introduction of the concept and basis of CC and some concrete examples, I will look at and form an opinion on the following issues:

- What is the influence of developments in corporate governance, RM and financial accounting on taxation and CC.
- CC was first designed for multinational companies, but what about smaller companies, including SMEs.
- CC will influence for instance audits, penalties, legal proceedings and therefore the formal tax law issues will have to be reviewed to see whether they are still adequate, for instance, tax-payer's (privacy) rights should be safeguarded in the technological domain.

14.2 Corporate Governance, Risk Management and Internal Control[2]

Corporate governance deals with how to organize and run a company.[3] What good governance actually entails in detail is not always to be found in legal rules. In many jurisdictions, sets of rules and principles have been

[2] This paragraph is based on the chapter Corporate Governance in Tax Assurance (ed. R. Russo), Kluwer, 2015, Chapter 3.

[3] See for definitions the various Corporate Governance Codes (UK: Governance and the Code, Germany: Preamble, US: Foreword and Introduction, NL: Preamble), for a general approach the OECD Principles of Corporate Governance, Preamble. The Codes can be found on http://www.ecgi.org/codes/all_codes.php.

laid down in a nonlegislative code by way of self-regulation. Under the threat of having legal rules, companies when possible opted to develop their own rules. The reason often given for this solution is that legislation is rigid and not capable of adapting to the ever-changing business world.[4] On the other hand, self-regulation cannot be enforced as easily as legislation. One of the principles of many self-regulation codes is that companies have to 'comply or explain'.[5] Still, noncompliance to a voluntary nonlegislative code does not have the same effect as noncompliance to legislation (even if explained, noncompliance to legislation leads to a penalty of some sort). This can be seen either as a pro or a con of self-regulation, depending on one's outlook. Companies usually see it as a positive element.[6] At the same time, in various jurisdictions, hybrid systems have grown. Good governance principles have been partly enacted into law.

The comply or explain principle has evolved to 'apply or explain'. In this concept, it is assumed that the executive board is more actively involved than the word 'comply' may suggest.[7] Hereafter with the term 'board' I refer to the executive board.

One of the characteristics of the board of a company is that it is accountable for its (financial) policies through a yearly report, i.e. the commercial accounts (also referred to as the financial statements). The financial accounts (made by the company) will usually be submitted to an audit of an accountant who will report his findings as part of the commercial accounts (in most jurisdictions, this is mandatory for larger companies). The number of subjects that has to be reported in the commercial accounts seems to grow each year. The accounts must comply

[4]See the UK Code under Comply or Explain, point 6 where it states that comply or explain is an alternative to a rules-based system.

[5]The OECD principles stress that the rules are not binding. The Dutch Corporate Governance Code explicitly has a separate first chapter on applying the Code. The German Code states the same in its preamble. The UK Code has a separate chapter after the Preface called 'Comply or explain'. The US Code in the last paragraph of its Foreword and Introduction mentions (not literally) the comply or explain principle.

[6]See for instance *De Toekomst van Toezicht*, nr 3, May 2013, a publication of Deloitte in which several companies express this view.

[7]See M. E. King (2009). *King Code of Governance for South Africa 2009*, Chapter 3. The governance compliance framework. Institute of Directors in Southern Africa.

with business law[8] (EU Standard 1–13[9]) and since 2005 the consolidated accounts of listed companies in the EU must comply with IFRS (insofar as they have been endorsed by the EC[10]).

Corporate governance codes have a great impact on the commercial accounts and the work and position of the auditor. Commercial accounts usually are to a large extent similar to or at least form a starting point for the tax accounts. This depends on whether, in a given jurisdiction, the tax accounts are formally linked to the commercial accounts. Even if there is no such formal link, there is usually a material link if only because many basic data are highly similar if not identical for both sets of accounts (for instance wages paid, goods sold, etc.).[11] Through the commercial accounts, corporate governance rules therefore indirectly influence the tax accounts. On top of this indirect connection, corporate governance rules sometimes address tax issues directly. In this paragraph, I will look more closely at the OECD corporate governance regulations.

14.2.1 Corporate Governance: OECD Regulations[12]

Corporate Governance Codes usually contain principles and best practices on good governance. They regulate the relationship between the shareholders, the board of directors and the supervisory board (or non-executive board members). There is separate attention for the role of the external auditor. The role of other stakeholders is explicitly

[8]For an overview of a business law perspective on RM see M. van Daelen (2012). *Riskmanagement en Corporate Governance*. Brugge: Die Keure, Chapter 3.

[9]See P. van Schilfgaarde (2013). *Van de BV en de NV*. Ed. 16, edited by J. Winter & J. B. Wezeman. Deventer: Kluwer, p. 456.

[10]Regulation 1606/2002/EC concerning the application of international accounting standards, adopted on July 19th 2002 by the European Parliament and the Council, see also D. Busso, IAS/IFRS and the new directive 2013/34/EU from the accounting perspective in Corporate Tax Base in the light of the IAS/IFRS and EU Directive 2013/34, (ed. M. Grandinetti), Eucotax Series, volume 48, Kluwer 2016.

[11]See Peter Essers, Theo Raaijmakers, Ronald Russo, Pieter van der Schee, Leo van der Tas, & Peter van der Zanden (2009). *The Influence of IAS/IFRS on the CCCTB, Tax Accounting, Disclosure, and Corporate Law Accounting Concepts—A Clash of Cultures*. EUCOTAX Series on European Taxation. Alphen a/d Rijn: Kluwer Law International, Chapter 2.

[12]The latest version dates from September 2015.

mentioned in paragraph IV of the OECD set-up (see further). Together these principles and regulations should clarify the conditions for and prerequisites of good governance.

The OECD has published principles of corporate governance to provide guidance as to which issues should be addressed in regulations concerning good governance. According to the OECD, there are six chapters in which the principles[13] are presented:

I. Ensuring the basis for an effective corporate governance framework
II. The rights and equitable treatment of shareholders and key ownership functions
III. Institutional investors, stock markets and other intermediaries
IV. The role of stakeholders in corporate governance
V. Disclosure and transparency
VI. The responsibilities of the board

For the commercial accounts, tax planning and tax risk management, IV, V, and VI are most directly applicable and I will look at the key elements of these principles more closely.

IV. The Role of Stakeholders in Corporate Governance

This section seems to focus upon stakeholders like investors, employees, creditors, customers and suppliers. Although other stakeholders are not excluded (there is a residual category 'other stakeholders'), they are not specifically dealt with. An important stakeholder is the government in its various forms, mostly represented by supervising authorities. It is vital for a company that the relationships with the government are good and based upon cooperation. In the note[14] on this latest OECD version of corporate governance principles, the Secretary-General gives an overview of the updates and he mentions tax specifically for VI (responsibilities of the board) but not for IV. A missed opportunity, in my view, to further

[13]The previous version also contained six principles, but principle II (as it is now) was divided into two principles. III was added new, so the total remains six.

[14]Included in the publication on corporate governance.

the concept of CC which is also embraced by the OECD[15] and which I will go into in paragraph 2.2.

V. Disclosure and Transparency

The company should disclose material information on the financial and operating results of the company, the company objectives, foreseeable risk factors and governance structures and policies and the process by which they are implemented (V.A). Under V.A.2, there is more emphasis on policies and performance relating to business ethics. Separately mentioned is country-by-country reporting. Although this paragraph is not limited to taxation, it is a major step in transparency in taxation. I actually wonder whether the considerable tax impact of this statement was fully realized by the authors. Taxation does not get mentioned specifically (see also VI below). According to V.B, the relevant data should be prepared and disclosed in accordance with high-quality standards of accounting and financial and nonfinancial disclosure. V.C, prescribes an annual audit by an independent, competent and qualified auditor to provide external and objective assurance to the board and shareholders that the financial statements fairly represent the financial position and performance of the company in all material respects. The audit committee should provide oversight of the internal audit activities and also of the external auditor. The external auditor should be accountable to the shareholders and has a duty to the company to exercise due professional care in the conduct of the audit (V.D).

This principle is directly applicable to the commercial accounts: the board should disclose all information in accordance with accounting standards. The external auditor is positioned strongly: an audit should be performed by an independent auditor who is accountable to the shareholders and oversight is provided by the audit committee. The issue of who appoints the auditor is not specifically mentioned, but the tendency is that this should be the audit committee.

VI. Responsibilities of the Board

The board must review and guide corporate strategy, major plans of action, risk policy, annual budgets and business plans. In addition, it is

[15] See Co-operative Compliance: a framework from enhanced relationships to Co-operative Compliance, OECD 2013, www.oecd.org/ctp/administration/co-operative-compliance.htm.

responsible for setting performance objectives, monitoring their implementation and managing corporate performance, as well as overseeing major capital expenditures, acquisitions and divestitures (VI.D.1). Of particular interest is VI.D.7: ensuring the integrity of the corporation's accounting and financial reporting systems, including the independent auditor, and that appropriate systems of control are in place, in particular systems for RM, financial and operational control and compliance with the law and relevant standards.

This principle is also highly relevant for the commercial accounts. The board is responsible for the systems that lead to the commercial accounts: the internal organization and control systems. Separately mentioned is the responsibility to comply with the law and relevant standards. This encompasses not only accounting law and standards, but all legislation, including tax law and standards. In VI.D.7, taxation is explicitly mentioned in the context of compliance and internal control. As mentioned in the comments on IV, there is a lot of attention for the position of the audit committee in relation to internal audit, but no explicit decision on who the internal auditor should report to: the audit committee or the board.

The OECD monitors the application of good corporate governance practices in jurisdictions and has published a Factbook Corporate Governance 2017.[16] While this factbook contains a lot of very valuable and relevant information, taxation does not appear in the review. I think this would have been a great opportunity to highlight the significance of taxation in corporate governance, especially if it would relate to the OECD's own guidelines for corporate governance as discussed above.

14.2.2 Risk Management, Internal Control and Taxation

In the corporate governance codes of most jurisdictions, taxation is not mentioned at all and in this sense the OECD guidelines form a positive exception. Even if tax is not mentioned specifically, it is a board responsibility to manage the main areas of risks for their company, which logically will include taxation. The way to manage tax risk is to build a system of internal control. In general internal control is often based on

[16] See http://www.oecd.org/daf/ca/corporate-governance-factbook.htm.

the COSO[17] framework (there are other frameworks, for instance ISO 31000[18]), but this is not specifically tailored to taxation. Generally, building an internal control system starts at the corporate strategy and principles, followed by a systematic description of all relevant factors required (personnel, budget, etc.) and finally detailing the relevant processes, including the appropriate tools and controls. The last stage is obviously the most detailed stage, which in the case of tax processes is to be implemented by the tax department (and external parties if necessary). The first stages are the responsibility of the board, even though in practice the tax department will provide the input for the decision of the board. It is vital that the board supports the tax strategy and makes sure it is aligned with the general strategy of the company. Very important is also that the system regularly has to be monitored and adjusted with respect to any errors, omissions or new developments. In this sense, a system of internal control is never finished, but always a work in progress.

14.2.3 Specific Guidance for a TCF: OECD, Accountancy Europe and What Is Missing

In this paragraph, I look at some publicly available guidance on how to build a tax control framework (TCF). In 2016, the OECD published a report on how to build a TCF: Cooperative Tax Compliance: Building Better Tax Control Frameworks.[19] In this publication, building blocks are provided for a TCF. The publication is not very detailed and although it contains valuable thoughts, it is too high-level to provide guidance on the more detailed level needed to actually build a TCF.

In 2018, Accountancy Europe also published a report on TCF from an accountant's perspective: Providing support in tax controls and

[17] See https://www.coso.org.

[18] See https://www.nen.nl/NEN-Shop/Norm/NENISO-310002009-nl.htm?keyword=iso%2031000&creative=272746307009&gclid=EAIaIQobChMImtu-Ty5-63AIVE7cbCh3LJwesEAAYBCAAEgLTZ_D_BwE.

[19] See http://www.oecd.org/publications/co-operative-tax-compliance-9789264253384-en.htm.

assurance.[20] This report is quite similar in actual content to the OECD report and subject to the same remarks.

In general, various issues concerning a TCF could benefit from further guidance. Without trying to make a complete list, I will mention some key points:

- Criteria on when a system of internal control is sufficient, to the extent an auditor can rely on it.
- Criteria when an auditor (for instance a tax auditor) can rely on a report from the auditor of the financial accounts.
- Criteria on which controls are most suitable for specific risks.
- Criteria on the functioning of monitoring procedures.

The issues I mention here raise several problems. The first problem is that all companies are different and the details of a TCF are, therefore, entity-specific. Furthermore, concrete guidance could lead to 'tick the box' behavior rather than true control. The second problem is that it is generally problematic for a tax auditor to rely on the report of the financial auditor, first in view of the different criteria applied to calculate income, and second—maybe most importantly—financial auditors apply a materiality (adjustment) threshold, whereas a tax auditor must correct any errors.[21] Although these problems are real, they should not be an excuse for Tax Authorities or organizations such as the OECD to refrain from developing more detailed guidance.

As a last point, I mention monitoring because personally I think this may be the most important issue. If a company shows that it monitors the working of its internal controls and improves and adapts the system when required, this should in my view be very important in assessing the quality of the assurance system. Monitoring often uses the same tools as auditing and therefore an audit can naturally build on the monitoring process.

[20] See https://www.accountancyeurope.eu/publications/providing-support-in-tax-controls-and-assurance/.

[21] See also 5.1 on materiality.

14.3 Cooperative Compliance, Including NL, UK, Australia, Singapore, Italy and ICAP

14.3.1 Introduction

CC originated at the beginning of this century as a result of the wish of companies and Tax Authorities to review their relationship.[22] From a 'vertical' style relationship (cops and robbers approach), in which companies and Tax Authorities principally viewed each other with distrust, a more 'horizontal' approach was deemed a better solution. The basis would have to be trust on both sides and informing each other in an early stage of relevant developments. In this way, it would be possible to work in the present rather than in the past (the old approach where parties usually interacted on the basis of an audit concerning older years). Another element was the fact that Tax Authorities would as much as possible make use of information that had already been gathered by for instance the company (through the RM and internal control system) or another supervisor such as the external auditor.

In addition, companies would voluntarily disclose all relevant information as soon as possible (and not exclusively in the tax returns) and Tax Authorities would try to react on this information as soon as possible as well. The hope was (and is) that many issues will be solved in an early stage so the tax return on these issues is no surprise. If an issue cannot be solved, it is identified as such in an early stage and parties can decide to take this particular point to court without losing trust in each other or otherwise compromising the relationship. They just agree to disagree on an isolated point.

Also, the trust of Tax Authorities in any taxpayer should have a proper foundation and this is generally found in the quality of the RM and internal control system, specifically of course as related to the field of taxation. This RM and control system is commonly referred to as the tax control framework (TCF). The TCF is not limited to compliance with tax rules (do the relevant tax returns, pay taxes due, etc.), but stretches to all issues concerning all taxes in the business, including things like reputational tax risk and the relationship with the tax authorities.[23]

[22] For more details see R. Veldhuizen in Tax Assurance (ed. R. Russo), Kluwer 2015, Chapter 6.

[23] See Tax Assurance: Nexiology in Taxation? Inaugural address at Tilburg University by R. Russo, November 4, 2016.

To build a TCF, the company must first develop a tax strategy which culminates in more practically applicable tax principles. These function as the broader scheme within which the TCF must be built. After the identification of the strategy and principles, the TCF will go into ever more detail and eventually will contain detailed descriptions of the relevant processes for all taxes. After the TCF has been put in place, its proper working should be monitored and adjusted where needed. This is a continuous process and in this sense, a TCF is never finished but moves with the dynamics of the company.

CC was initially referred to as 'Horizontal Monitoring' or 'Enhanced Relationships', but these terms were deemed less suitable as they could indicate a breach of the equality principle or point to so-called 'sweetheart deals', which was certainly not intended. CC was therefore brought forward as the new term. It is not just a new word, it also highlights the fact that two parties work together for a common goal, as can be read in the OECD report CC: a framework (2013).[24]

14.3.2 Some Concrete Examples of Cooperative Compliance

The Netherlands

In the Netherlands, companies can enter into a (non-legislative) covenant with the tax authorities. There are no formal requirements, but prior to concluding the covenant, the Tax Authorities assess whether they think the level of the TCF is adequate. If it is not, a covenant is still possible if the company is willing to improve its TCF. The exact requirements for a TCF are not known, because the Tax Authorities are of the opinion that a TCF is company specific. There is a publication on CC in general but this contains no specifics on the TCF.[25] The advantages of the CC regime for companies are that they have a designated contact person[26] at the Tax Authorities with who they can contact on specific issues. The Tax Authorities strive to react as quickly as possible to questions. The company has to disclose all issues which might lead to discussions. This obligation is not a legal one but stems from the covenant. The company is

[24] See http://www.oecd.org/publications/co-operative-compliance-a-framework-9789264200852-en.htm.

[25] See https://download.belastingdienst.nl/belastingdienst/docs/leidraad_toezicht_grote_ondernemingen_dv4231z1fd.pdf.

[26] This contact person also existed before CC, but is now inbedded within CC.

thus presumed to be left with fewer uncertain tax positions in its financial accounts. Another advantage is that the Tax Authorities share their supervision plans with the company. For the tax authorities, the advantage is that in principle all potential tax issues are reported by the company itself. Furthermore, the Tax Authorities can reduce their audit efforts if they can depend on the internal controls of the company and/or the work of other auditors (such as the external auditor).

For SMEs, it is not possible to conclude an individual covenant with the Tax Authorities, if only because of the very large number of companies involved. Another reason is that the internal controls of smaller companies usually are not sufficient for the Tax Authorities to depend on. SMEs can join CC, but this is structured through Tax Service Providers (TSP, usually accounting firms). I refer to paragraph 4 for more detail on this issue.

The United Kingdom

In the United Kingdom, CC is limited to large companies. The companies are subjected to risk assessment in which their tax principles play a significant role.[27] The company is assigned a Client Relationship Manager[28] who coordinates all contacts. The risk assessment is focused on the level of internal control and the tax-related behavior of the company (its tax principles). Compliance to tax obligations is primarily a concern for the company, but '..HMRC will provide assistance to resolve uncertainty around complex or significant issues and commercial transactions.' There is also a High Risk Corporate Program[29] which aims to resolve the tax issues of very large businesses by agreement or litigation, reduce the scale of risk for the future and improve the relationship between Her Majesty's Revenue and Customs (HMRC) and its large business customers. Contrary to the Dutch Tax Authorities, HMRC provides some guidance for the TCF,[30] but the rules remain general in nature. In essence, the same elements as in the Netherlands can be seen: emphasis on internal control and RM as well as the behavior of the company, although this last element as such is not an issue in the Dutch

[27] https://www.gov.uk/guidance/hm-revenue-and-customs-large-business#hmrcs-approach-to-large-business-tax-compliance.

[28] https://www.gov.uk/guidance/large-business-strategy.

[29] https://www.gov.uk/guidance/large-business-the-high-risk-corporates-programme.

[30] https://www.gov.uk/hmrc-internal-manuals/tax-compliance-risk-management.

system. There is a program for mid-sized businesses,[31] but this seems more educational in nature than true CC.

Australia

As in the United Kingdom, the Australian program is limited to large companies. They can enter into an Annual Compliance Arrangement (ACA).[32] ACA's are voluntary arrangements to tailor the compliance relationship between the Tax Authorities and the company, rather than working through traditional compliance approaches, like audits and risk reviews. The advantage for the company is greater practical certainty, concessional treatments of penalties and interest, and strategies to mitigate tax risks before they arise. In return, the company must disclose its material tax risks and do so when they arise. The ACA is concluded for a 3 year period, after which it can be extended if both parties agree. The system seems akin to the United Kingdom and Dutch system, although the formal 3 year period leads to a clearer assessment whether to extend or not.

Italy

In Italy, after a pilot on CC which started in 2013, a legal setting for CC has been implemented in 2016. The program is in principle only open to very large companies. A company that wants to enter the program needs to have, among others, an effective TCF and a transparent and cooperative attitude toward the Tax Authorities. Advantages for the company are that they can apply for advance rulings quicker and that penalties are lowered by 50%. The emphasis is on the TCF, for which companies can use internationally recognized standards such as COSO. In 2017, the CC regime was explained in more detail in a new regulation. The regime in Italy is comparatively new, so it is difficult to evaluate. The importance of the TCF, however, is paramount and the fact that there is a legal basis is important and a difference with the regimes discussed earlier.[33]

[31] https://www.gov.uk/government/collections/support-with-tax-as-a-mid-sized-business.

[32] https://www.ato.gov.au/Business/Large-business/In-detail/Compliance-and-governance/Annual-Compliance-Arrangements---what-you-need-to-know/.

[33] See M. Manca, The New Italian Cooperative Compliance Regime, 56 *European Taxation* 4 (2016), K. Bronzewska and V. Tamburro, Cooperative Compliance in Italy—Does It Stand a Chance? 53 *European Taxation* 12 (2013).

Singapore

In Singapore, CC has been formalized in the Enhanced Taxpayer Relationship program (from 2008).[34] The core of the program is that companies and Tax Authorities set out a mutual plan to solve specific tax positions. Advance rulings are possible and it is possible to review the TCF with the Tax Authorities and discuss amendments and improvements. The latter possibility shows that there is ample guidance from the Tax Authorities on the building of the TCF.

Germany

In Germany, there is no legal basis for CC, but there is some guidance on how to make a TCF (not a legal rule but a publication by the Tax Authorities: PS 980), quite similar to COSO.[35] Having a TCF is no legal requirement but can induce fewer or lower penalties, as it can indicate that there is no intention of tax evasion. The system seems to be handled in a formal way (influence on penalties and the matter of guild).

ICAP

Essentially, ICAP (international Compliance Assurance Program) is an international plan in which Tax Administrations of participating jurisdictions work together to give more assurance to participating multinational enterprises (MNEs) on the international tax treatment of two specific points: Transfer Pricing (TP) and Permanent Establishment Risk (PE). The participating jurisdictions are: Australia, Canada, Italy, Japan, the Netherlands, Spain, UK, and USA.

If an MNE is willing to participate in the pilot project, it will be asked to provide a package of documentation. Within six weeks of providing the package, there will be a kick-off meeting between the MNE and all tax administrations on this documentation, where the participants will agree on the process to be followed. The meeting consists of an assessment by all tax administrations, ending in an initial risk assessment and possibly a

[34] See https://www.iras.gov.sg/irashome/Businesses/Companies/Getting-it-right/About-the-Enhanced-Taxpayer-Relationship-Programme.

[35] For more information see Heuel/Konken, Tax Compliance – sinnvoll oder überflüssig? Hinweise zu einem interessanten Betätigungsfeld für Berater AO-StB 2017, 345–353, Ludwig/Eilers/Kusch: Der Weg zu einem globalen steuerlichen Kontrollsystem, DStR 2017, 1056 and Kowallik, Vom innerbetrieblichen Kontrollsystem für Steuern zum Tax Compliance Management System, DER BETRIEB Nr. 08, February 24, 2017.

more in-depth risk assessment if required. The aim is to gain assurance that the MNE poses no or low risk for each of the covered risks (TA and PE). The assurance gained is not the same legal certainty as for example with an advance price agreement, but gives assurance that tax administrations consider the risk low.

The main requirement for an MNE is to produce the package of information. This must contain: Country by Country report, Master file, Local files, the tax strategy and relevant tax control frameworks, Consolidated financial statements, Audited financial statements, Information on uncertain tax positions, Current global business structure, Description of material differences between financial statements and tax returns, Value chain analysis, Permanent establishment documentation and Supporting transfer pricing documentation. Of these reports most will be already available. Things like Value chain analysis, Current global business structure and Description of material differences between financial statements and tax returns are probably not available in the detail required and may, therefore, require additional work. ICAP as such is not exactly CC on a truly international basis, but with its emphasis on risk assessment to gain assurance on certain internationally coordinated issues it has common traits and could be seen as a first step toward international CC.

14.3.3 Some Conclusions on CC and Risk Management in an International Context

In all jurisdictions viewed above and also in ICAP, the position of RM and internal control is paramount. It is not possible to enter any of the programs without a TCF of adequate quality. It is not always easy to ascertain whether or not the TCF is adequate. This assessment is usually based on COSO or other internationally recognized standard of internal control in general. There is some more specific guidance for internal control on taxation by organizations, but it is not very elaborate. The level of detail that is needed for an actual TCF (some of which I discussed in 14.2.3) cannot be found in these reports. Most jurisdictions provide their own guidance (in a separate publication or in willingness to provide concrete feedback). The level of detail varies greatly. Tax Authorities of different jurisdictions also vary in the degree they are actively involved in the TCF. Singapore seems to be the country where the TCF is discussed most directly between a company and the Tax

Authorities. The level of detail in specific issues as mentioned in 14.2.3 is not provided.

14.4 CC and SMEs

In paragraph 3, I viewed CC in some jurisdictions and in all cases except the Netherlands CC was only open to big companies. This is not surprising, given the emphasis on internal control that jurisdictions generally use in implementing CC. There is an inherent difference in internal control between SMEs and big companies. With SMEs, the TCF often lacks some of the checks and balances that are present with big companies, the main one being that an SME's board members are to a significant degree also owners of the company. This does not mean that CC is as a rule not applicable for SMEs, but it does mean that another approach might be useful. In the Netherlands, there is a special program for SMEs in which the intermediaries (generally accounting firms, hereafter also TSP) play a major role.[36] Essentially, the inherent weaknesses in the TCF of an SME are supplemented by the quality system of the accountant of that SME. The Tax Authorities asses the system of the accountant who can, if the assessment is positive, then apply to be a TSP for SMEs. This is formalized in a contract between Tax Authorities and TSP. If an accountant has a client which he feels is ready for CC, he can submit this client under the contract he has with the Tax Authorities. For the company, the advantage is that its advisor is in direct communication with the Tax Authorities and that an audit is, therefore, less likely. The advantage for the Tax Authorities is that they receive tax returns that have been subjected to a quality control system and need little attention. Instead, the Tax Authorities can focus their audit on meta supervision: they will periodically select a limited number of TSPs and audit the returns that these have filed for their clients.

For the Tax Authorities to admit an intermediary, it is very important that the accountant has a quality control system that is subjected to some form of external supervision. Many accountants are members of a professional organization which can organize such external supervision. For accountants who do not have such a network, it is in practice difficult

[36] See the relevant publication of the Dutch Tax Authorities: http://download.belastingdienst.nl/belastingdienst/docs/leidraad_horizo_toezicht_fiscaal_dienstverl_dv4071z2pl.pdf.

to be admitted as an intermediary. A much-heard complaint by TCP's and their clients is that the practical gain of being a TSP is not sufficient. The quality system will obviously have the result that more hours are spent on the client, so his (accounting services) bill is higher. Through the meta supervision, there is no certainty that the tax returns filed by the TCP are final. The last step in this process would be to guarantee just that: returns filed by a TSP for a client are final for this client (except in cases of fraud). The meta supervision would have to stay and if mistakes are found, the TSP is held liable. This would in effect mean outsourcing tax supervision to commercial parties and as such should be treated with great caution, but is not unheard of.[37] The OECD also has a publication specifically on TSPs and SMEs, but the treatment of the subject is on a high level without many practical details.[38]

14.5 Some New Developments Which Will Influence Taxation

14.5.1 Public Country by Country Reporting (CBCR)

CBCR is mainly known for taxation purposes.[39] International companies of a certain size have to report to their Tax Authority how much Corporate Income Tax they pay in each of the jurisdictions in which they are active. In the near future, this information will probably also become mandatory for the financial accounts[40] and thereby become public (indeed some industries already have to disclose this information).[41]

[37] For more details see B. Herrijgers in Tax Assurance (ed. R. Russo), Kluwer 2015, Chapter 7

[38] Rethinking Tax Services, The Changing Role of Tax Service Providers in SME Tax Compliance, OECD 2016, see http://www.oecd.org/ctp/rethinking-tax-services-9789264256200-en.htm.

[39] As devised by the OECD as part of the BEPS plan, action 13, see http://www.oecd.org/tax/transfer-pricing-documentation-and-country-by-country-reporting-action-13-2015-final-report-9789264241480-en.htm and implemented by the EC as part of the Anti Tax Avoidance Package, see: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1454056899435&uri=COM:2016:25:FIN.

[40] At least in Europe, see European Commission (2016), Proposal for a Directive of the European Parliament and of the Council, amending Directive 2013/34/EU as regards disclosure of income tax information by certain undertakings and branches.

[41] See E. Gerrits in Tax Assurance (ed. R. Russo), Chapter 9, Tax Accounting, Sect. 9.

Public CBCR will have considerable consequences for taxation. For instance: if the information is publicly available, why should it then be reported separately to the Tax Authorities? If the information is in the public domain, how will the public (through, for instance, NGOs) react to the information thus disclosed, in other words: will it generate negative tax publicity for the company involved? Another issue is the annual (corporate income) tax return. In effect, this return might become obsolete if the correct amount of Corporate Income Tax is already stated in the financial accounts (which usually have to be filed earlier than the tax return). Of course, there are many issues still to be solved. One of these is the matter of materiality. A mistake in the financial accounts does not have to be corrected if it is not material, this is to say that a stakeholder basing a decision on the accounts would not take a different decision if the mistake was corrected. In practice, with big companies, the materiality threshold may amount to many millions. For taxation, materiality is nonexistent: every mistake that is discovered must in principle be corrected. Another issue is the exchange of information on CBCR that Tax Authorities have implemented on the basis of formats. The format of the financial accounts would probably be very different and so could not easily be used for the exchange. This is also assuming that the relevant information of both CBCRs is identical. The above-mentioned facts lead to the conclusion that public CBCR is an example of a development in financial accounting with substantial consequences for taxation. Because of this fact, it will also influence the system of RM and internal controls.

14.5.2 Mandatory Disclosure

Based on an OECD report,[42] the Council of the EU adopted a draft directive (COUNCIL DIRECTIVE amending Directive 2011/16/EU as regards mandatory automatic exchange of information in the field of taxation in relation to reportable cross-border arrangements) on May 3, 2018.[43] On the basis of this directive intermediaries, such as tax advisors, accountants and lawyers that design and/or promote tax planning schemes will have to report certain advice given (potentially aggressive, cross-border) to the Tax Authorities. The information received will

[42] See http://www.oecd.org/tax/mandatory-disclosure-rules-action-12-2015-final-report-9789264241442-en.htm.

[43] http://data.consilium.europa.eu/doc/document/ST-7160-2018-INIT/en/pdf.

be automatically exchanged internationally between Tax Authorities through a centralized database. If intermediaries do not comply, they can be liable to penalties. Also, in this situation, the recipient company must report the advice. 'The new rules are a key part of our strategy to combat corporate tax avoidance', said Vladislav Goranov, minister for finance of Bulgaria, which currently holds the Council presidency. 'With greater transparency, risks will be detected at an earlier stage and measures taken to close down loopholes before revenue is lost'.[44] Effectively it is hoped that the mandatory disclosure rules will affect the strategy of advisors and companies to more transparency and less tax avoidance. It will also affect the TCF of the company: although the directive targets advisors, companies will generally be the subjects of the advice. In view of the wish of companies to have as much certainty as possible (no surprises in the boardroom) and to prevent reputational damage, their boards will more than ever probably avoid aggressive structures (at least this is the hope of the EC). In effect, in terms of RM, the risk appetite of companies in the field of taxation is expected to change. This will lead to reviewing the TCF and possibly adjusting it according to the outcome of the review.

14.5.3 Technology

In a company, there are many streams of data that need to be processed for various goals. One goal is the measurement of the performance of the company for management purposes. Another is to provide input for the financial accounts or the tax accounts. The data streams can take the form of inflows and outflows of funds (such as sales and cost). One of the challenges for a company is to ensure these vital streams are dependable. Another challenge for a multinational company is that the financial data streams for all subsidiaries have to be reconciled in the consolidated accounts of the top company. A final challenge is to ensure that the data that are used for one goal are also usable for another goal: in essence that data sets are not changed in the process of use for one particular

[44] Quote from the press release on May 25, 2018, see http://dsms.consilium.europa.eu/952/Actions/Newsletter.aspx?messageid=21858&customerid=14561&password=enc_4345443939313146_enc.

goal.[45] In all these matters the possibilities of technology play an important role. The quality of the data streams is monitored with technological tools and the various uses of the data are integrated as much as possible so that manual adjustments (and the corresponding risk of mistakes) are avoided. The internal controls depend on these tools more and more and if they are adequate, an external auditor can rely on (the outcome of) these tools as well.

Tax Authorities increasingly use technology as well.[46] In 2017, the IOTA (Intra-European Organization of Tax Administrations) published a report on applying data and analytics.[47] In this report, the joint tax administrations identify 5 topics in as many chapters and 1 chapter with miscellaneous subjects. The topical chapters are about:

- data management
- predictive modeling
- social network analysis
- data visualization
- random Audits

In the report, the various Tax Authorities discuss methods that they apply and exchange experiences. What I miss in the report are current developments like CBCR or Transfer Pricing, which is strange as they are the most likely candidates to involve large data sets in direct taxes. There is some consideration for audit, but not what I expected on sampling or analytical techniques. There is also nothing on the boundaries that Tax Authorities must bear in mind (such as the equality principle, privacy or data security.[48]

If the use of technology advances, the question is whether the current tax laws will still be adequate. If for instance international joint audits take place, which legislation will apply if the results are challenged by

[45] See R. Hoyng, N. Andrews, M. Kennedy in Tax Assurance (ed. R. Russo), Chapter 5: A Tax Operating Model.

[46] For instance by standardizing so information can be shared easier, such as SAF-T (Standard Audit File for Tax), for more information see A.H. Bomer, inaugural lecture November 23, 2017 at the Vrije Universiteit Amsterdam, Sect. 14.2.3.

[47] See www.iota-tax.org/applying-data-and-analytics-tax-administrations.

[48] For more information see also Advanced Analytics for Better Tax Administration, OECD 2016. https://doi.org/10.1787/9789264256453-en.

the taxpayer? If an assessment by Tax Authorities is made independently on the basis of their own data, the systems of the company have to be able to match this performance so that the company can check whether they agree and file a complaint if they do not. Current formal law requirements have the premise that the company has filed a return for the assessment to be based upon, so the company can always check the assessment against the return they filed. The position of intermediaries such as tax advisors and accountants will change as well: they also have to be able to assess information quicker. All in all, the systems of RM and internal control will surely be affected by the increasing use of technology by the company and by Tax Authorities.

Tax Authorities will also be challenged to react to the enormous amounts of information that companies have to send to them. It is unavoidable that they will have to make use of clever technology tools to extract and compare the data they need. A practical problem in this respect is the cost of these tools and the updates required. Probably big tech companies will provide the technology, since the investments and know-how needed for development and security are huge and certainly for individual countries may be impossible to raise.[49] If this proves to be the case, these tech companies will acquire a lot of power. One way to counteract this is for countries not to work on an individual basis but jointly form a strong counterpart for the tech companies.

14.6 Concluding Remarks

With regard to the issues I mentioned in the introduction, it has been made clear that developments in corporate governance, RM and financial accounting influence taxation and CC. The emphasis of regulators on aggressive tax saving structures (for example mandatory disclosure regulations) influences the policies of companies, their RM and internal controls in the field of taxation. Public country by country reporting is one of the financial accounting developments that will influence taxation. As for SMEs, it is clear that for CC to have a true impact on the taxation of companies it should also include these. The model for MNEs cannot be applied to SMEs in the same way because internal control in an SME is usually not on the same level as in an MNE, but this can

[49] As an example see https://www.pwc.nl/en/publicaties/tax-administration-by-pwc-and-microsoft.

be addressed (for instance by using the TSP). All these changes make it necessary to review current formal tax laws and adapt them where necessary.

CC faces big challenges and should continue to be developed. One area of development is providing more guidance by Tax Authorities on the TCF, for instance (but not limited to) in the points I mention in 14.2.3. In my opinion, there should be a lot of attention to the monitoring function as this is a clear indicator of how the company practices what it preaches. Technology can be helpful as a tool in this context, for companies and (tax) auditors alike. A practical problem in this respect is the funding of all this technology and the power it places in the developer of it. If countries work together in the development of technology (rather than do it all individually) they may be able to provide a balance in this relationship.

CHAPTER 15

State Aid and Tax Rulings: Managing the Risk of Recovery

Chiara Francioso

15.1 Overview: The Commission's Inquiry on State Aid and Tax Rulings

The State aid framework is—together with the fundamental freedoms and the principle of non-discrimination—one of the tools to indirectly ensure a minimum standard of integration within the single market ("negative integration"). Its application has a great impact in the area of taxation, as the matters harmonized ("positive integration") by the Treaty on Functioning of the European Union (TFEU) do not include direct taxation.[1]

[1]The European Union currently lacks general competence to regulate the area of taxation and has no tax system. The Council must unanimously agree on tax proposals, under the special legislative procedure set forth in Art. 113 and 115 TFEU, which results in the possibility of national veto. The European Commission has recently proposed to move to qualified majority voting in EU tax policy (COM [2019] 8 final). *See* Tesauro, F. (2017). *Istituzioni di diritto tributario. Parte generale*. Milano: UTET, 82; Remeur, C. (2015). *Tax Policy in the EU: Issues and Challenge*. European Parliament Research Service, 1.

C. Francioso (✉)
School of Law, University of Milano-Bicocca, Milan, Italy
e-mail: c.francioso@campus.unimib.it

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Art. 108 TFEU reserves for the European Commission the power to keep under constant review all systems of aid existing in the Member States, with their cooperation.[2]

In order to curb harmful tax competition, in 1997 the Council of Economics and Finance Ministers (ECOFIN) adopted, on a proposal of the Commission, the Code of Conduct for business taxation. The States agreed on a non-binding instrument, but rather a political commitment to reexamine, amend or abolish their existing tax measures that constituted harmful tax competition ("rollback process") and refrain from introducing new ones in the future ("standstill process"). As a matching commitment to this political agreement, many Member States urged the Commission to reexamine its policy on fiscal State aid and to make full use of its powers under the Treaty rules in order to curb harmful tax competition[3]. This action resulted in the Commission Notice of 1998 on the application of State aid rules in the area of business taxation,[4] which aimed to link the provisions of the Treaty and related rules on State aid

Available at http://www.europarl.europa.eu/RegData/etudes/IDAN/2015/549001/EPRS_IDA(2015)549001_EN.pdf. Since 1974, the Court of Justice of the European Union (CJEU) has clarified that the Commission's competence in the field of State aid control also covers the area of direct business taxation. ECJ, 2 July 1974, C-173/73, *Italy v. Commission*, para. 13: "The aim of Art. 92 is to prevent trade between Member States from being affected by benefits granted by the public authorities which, in various forms, distort or threaten competition by favoring certain undertakings or the production of certain goods. Accordingly, article 92 does not distinguish between the measures of State intervention concerned by reference to their causes or aims but defines them in relation to their effects. Consequently, the alleged fiscal nature or social aim of the measure in issue cannot suffice to shield it from the application of Article 92".

[2] In order to enhance the cooperation between the Member States and the Commission, the latter has recently adopted the Code of Best Practices for the conduct of State aid control procedures (C [2018] 4412 final). Available at http://ec.europa.eu/competition/state_aid/reform/best_practise/en.pdf.

[3] ECOFIN, *Code of Conduct for Business Taxation*, para. (J). Available at https://eur-lex.europa.eu/resource.html?uri=cellar:d2cdddef-e467-42d1-98c2-31b70e99641a.0008.02/DOC_2&format=PDF. *See* Monti, M. (1999). How State Aid Affects Tax Competition. *EC Tax Review*, *4*, 209.

[4] Commission notice on the application of the State aid rules to measures relating to direct business taxation (98/C 384/03) (1998) [hereinafter *1998 Commission Notice*]. Available at https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:1998:384:0003:0009:EN:PDF.

to the fight against harmful tax competition and provided guidance for the first time on discretionary administrative practices.[5]

Pursuant to Art. 107 TFEU, a measure is incompatible with the internal market if the following criteria are cumulatively met:

(a) it confers an advantage on the recipient;
(b) it is granted by a Member State or through State resources which can take a variety of forms (tax reliefs included);
(c) it is granted on a selective basis (i.e. favoring certain undertakings or industry sectors);
(d) it distorts or threatens to distort competition and is likely to affect trade between Member States.

The procedure followed by the Commission, to carry out this review, is typically structured in a preliminary phase possibly leading to a first decision of alleged State aid: by doing so, the Commission opens a formal investigation, inquiring the State and the company for information and possible justifications to the favorable tax treatment granted to the latter. This is followed by a second and final decision that may either confirm or dismiss the initial doubts expressed in the first. If the initial allegation of aid is confirmed, the decision will order the recovery of the unlawful favorable treatment granted by the Member State.[6] The latter must comply with the obligation of recovery within the deadline set in the Commission decision and, pursuant to Art. 16 Regulation 2015/1589, it must do so immediately and effectively.

Both parties can seek judicial remedy before the Union Courts: on the one hand, if the State concerned by the investigation does not comply within the prescribed time, the Commission (or any other interested

[5] *Ivi*., paras. 21–22.

[6] Art. 16 Regulation No. 2015/1589. The Treaties do not explicitly establish the obligation of recovery: instead, it has been inferred by the Union Courts' case law from Art. 108 TFEU (ex Art. 88 TEC) and later incorporated in the EU secondary law. *See* the first case, *ex multis*, ECJ, 12 July 1973, *Commission v. Germany*, C-70/72, para. 13. *See* also Commission Notice 2007/C 272/05 *Towards an effective implementation of Commission decisions ordering Member States to recover unlawful and incompatible State aid*, paras. 9-10 [hereinafter *Recovery Notice*]. Available at https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52007XC1115(01)&from=EN; Moreno González, S. (2017). *Tax rulings: intercambio de información y ayudas de Estado en el contexto post-BEPS*. Valencia: Tirant lo Blanch, 250.

State) may, by way of derogation from Arts. 258 and 259 TFEU, refer the matter directly to the Court of Justice (ECJ)[7]; on the other hand, the State, as well as the addressees of aids, can challenge the decision for annulment before the General Court (EGC).[8] The judgments of the General Court can be appealed to the Court of Justice.

In this context, in recent years we have witnessed the Commission taking a tougher line on State aid controls of fiscal nature, especially with regard to aids granted through the issuance of tax rulings.[9]

This course of action, however, should not be misinterpreted: not all tax rulings confer State aid on the taxpayer.[10] A tax ruling is a written statement, issued to the taxpayer by tax authorities, that interprets and applies the law to a specific set of facts.[11] Under the rule of law—the basis for the western legal tradition—advance rulings should not be meant to attract foreign investments, grant advantages not provided by

[7] Art. 108(2) TFEU. A case of this kind was brought before the Court as Ireland had failed to recover the State aid granted to Apple within four months following the notification of the decision (action brought on 5 December 2017, *Commission v. Ireland*, C-678/17): the case has been discontinued due to Ireland taking the measures necessary to comply with the obligations arising from the Commission's decision of recovery.

[8] Pursuant to Art. 278 TFEU, actions brought before the CJEU do not have suspensory effect. With regard to the obligation of recovery, the recovered amount can be placed in an escrow account, pending the outcome of the EU court procedures. The Court may, however, if it considers that circumstances so require, order to suspend the application of the contested act (Art. 278 TFEU).

[9] In June 2013, the Commission set up the Tax Planning Practices task force to follow up on public allegations of favorable tax treatment of certain companies voiced in the media and in national Parliaments. Since then, the task force has been reviewing the tax ruling practices of Member States from the perspective of State aid rules, identifying those not reflecting in a reliable manner what would result from the application of the ordinary tax rules. *See* State Aid Register. Available at http://ec.europa.eu/competition/state_aid/tax_rulings/index_en.html.

[10] De Broe, L. (2015). The State Aid Review against Aggressive Tax Planning: 'Always Look a Gift Horse in the Mouth'. *EC Tax Review*, *6*, 291; DG Competition, *Working Paper on State Aid and Tax Rulings*, Internal Working Paper—Background to the High Level Forum on State Aid of 3 June 2016, para. 5 [hereinafter *DG-Comp Working Paper*]. Available at http://ec.europa.eu/competition/state_aid/legislation/working_paper_tax_rulings.pdf.

[11] OECD, *Advance Ruling*, Glossary of Tax Terms. Available at http://www.oecd.org/ctp/glossaryoftaxterms.htm. *See* also Romano, C. (2002). *Advance Tax Rulings and Principles of Law Towards a European Tax Rulings System?* Amsterdam: IBFD, 78; Rogers-Glabush, J. (Ed.) (2015). *International Tax Glossary*. Amsterdam: IBFD, 11.

the law or to offer the taxpayers new tax avoidance tools.[12] Indeed, «one should be taxed by law, and not be untaxed by concession».[13] Given the complexity and heterogeneity of national tax legislations, rulings are a key instrument to provide the economic operators with the legal certainty needed to carry out structured transactions (as, for instance, the cross-border ones[14]) and to ensure consistency in the interpretation of tax provisions.[15] Besides, their use promotes cooperation between taxpayer and tax administration, making it easier for the first to comply with complex provisions and for the latter to perform its audit.[16] Therefore an indiscriminate restriction to the use of tax rulings or the excessive narrowing of their scope could affect the efficiency and simplicity of modern tax systems.

For these reasons, the Commission, as stated in its documents,[17] does not call into question the granting of tax rulings by the tax administrations of the Member States. Its scrutiny, pursuant to article 107 TFEU, is limited to those rulings that confer a selective advantage on

[12] Romano, C. (2001). Private Rulings Systems in EU Member States. A Comparative Survey. *European Taxation, 1*, 30. *See* also Lang, M. (2015). Tax Rulings and State Aid Law. *British Tax Review, 3*, 395; Van Eijsden, A. Killmann, B. Meussen, G. T. K. (2010). General Part. In M. Lang, P. Pistone, J. Schuch, & C. Staringer, (Eds.), *Procedural Rules in Tax Law in the Context of European Union and Domestic Law*. Alphen aan den Rijn: Kluwer Law International, 12.

[13] To borrow Walton J.'s eloquent expression in *Vestey v. Inland Revenue Commissioners* [1979] Ch. 177, 197. The judgment addresses the legal basis in the British tax system of the extra-statutory concessions, a practice that allowed the Inland Revenue to give taxpayers a reduction in tax liability to which they would not be entitled under the strict letter of the law. *See* Daly, S. (2017). The Life and Times of ESCs: A Defence? In P. Harris & D. De Cogan (Eds.), *Studies in the History of Tax Law: Volume 8* (pp. 169–194). Oxford: Hart Publishing.

[14] *See* De Broe, L., *supra* note 10, 291; *DG-Comp Working Paper*, *supra* note 10, para. 5; and Givati, Y. (2009). Resolving Legal Uncertainty: The Unfulfilled Promise of Advance Tax Rulings. *Virginia Tax Review*, *29*, 137.

[15] *See* Romano, C., *supra* note 12, 22.

[16] Explanatory report on Legislative Decree No. 156/2015, 1. Available at http://www.governo.it/sites/governo.it/files/79296-10390.pdf. *See* McKee, M., Siladke, C. A., & Vossler, C.A. (2018). Behavioral Dynamics of Tax Compliance When Taxpayer Assistance Services Are Available. *International Tax and Public Finance, 3*, 722.

[17] *DG-Comp Working Paper*, *supra* note 10, para. 5; Commission Notice on the notion of State aid as referred to in Article 107(1) TFEU (2016), para. 174 [hereinafter *2016 Commission Notice*]. Available at http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016XC0719(05)&from=EN.

the company by lowering the tax liability in the issuing State as compared to companies in a similar factual and legal situation. Dealing with discretionary administrative practices, 1998 Notice states that administrative rulings merely providing an interpretation of general rules do not give rise to a presumption of aid, while those departing from the general tax rules to the benefit of individual undertakings must be analyzed in detail.[18] Further guidance has been provided in the Commission Notice on the notion of State Aid released in 2016, according to which tax rulings confer a selective advantage on a company where: (a) the ruling misapplies national tax law and this results in a lower amount of tax; (b) the ruling is not available to undertakings in a similar legal and factual situation; or (c) the administration applies a more favorable tax treatment compared with other taxpayers in a similar factual and legal situation.[19] In this respect, the Commission claims that tax authorities apply a treatment of this kind, for instance, when accepting a transfer pricing arrangement which is not at arm's length because the methodology endorsed by the ruling produces an outcome that departs from a reliable approximation of a market-based outcome or if the ruling allows its addressee to use alternative, more indirect methods for calculating taxable profits (e.g. fixed margins for a cost-plus or resale-minus method for determining an appropriate transfer pricing), while direct ones are available.[20]

As well summarized by the State Aid Register,[21] since June 2014, the Commission has opened eleven formal investigations for alleged aid granted to well-known multinational groups by means of tax rulings offering a low level of taxation. These investigations have resulted in six final decisions of recovery of unlawful State aid granted by Luxembourg (to *Fiat*, *Amazon* and *ENGIE*), the Netherlands (to *Starbuck*), Ireland (to *Apple*) and Belgium (to 35 MNEs through the "excess profit

[18] However, in literature it has reasonably been argued that determining whether a tax ruling "*merely interprets*" or "*deviates from*" the normal application of a tax provision can be complicated in practice, especially considering the fact that rulings are used to provide certainty where the "*normal application*" of the law is not obvious. *See* De Broe, L., *supra* note 10, 291; Avi-Yonah, R. S., & Mazzoni, G. (2016). Apple State Aid Ruling: A Wrong Way to Enforce the Benefits Principle? *University of Michigan Law & Economics Research Paper Series*, Research Paper No. 16-024, 6. Available at SSRN: https://ssrn.com/abstract=2859996.

[19] *2016 Commission Notice*, *supra* note 17, para. 174.

[20] Ibid.

[21] http://ec.europa.eu/competition/state_aid/tax_rulings/index_en.html.

scheme"[22]). Further investigations are still ongoing toward the UK, for alleged aid to the MNEs benefitting from the "group financing exemption", the Netherlands, for tax rulings issued to *Inter IKEA*[23] and *Nike*, and Luxembourg, for the rulings granted to *Huhtamäki*. The Commission has also investigated on Gibraltar's ruling practice as a whole, assuming that it may constitute an aid scheme on grounds of a discretionary exercise of powers.[24] However the final decision of recovery concludes that the tax ruling practice as such does not constitute an aid scheme, while individual aids have been granted on the basis of five tax rulings.[25] Thus far, the only negative final decision concerns the Luxembourgish tax rulings issued to *McDonald's*: the Commission found that non-taxation of certain McDonald's profits in Luxembourg did not lead to illegal State aid, as it was in line with national tax laws and the Luxembourg-United States Double Taxation Treaty.[26]

The inquiry of the European Commission regarding tax rulings has been focusing, in particular, on advance pricing agreements (APAs), which endorse transfer pricing arrangements proposed by the taxpayer to determine the tax base of corporate groups, and on "confirmatory rulings", which confirm the application, or the non-application, of certain legislative provisions to a specific situation.[27] Moreover, the Commission's investigations target ruling systems that may constitute "aid schemes" under article 1(d) of Regulation No. 2015/1589, according to which an aid scheme is "any act on the basis of which, without further implementing measures being required, individual aid awards

[22]The EGC annulled the Commission decision which qualified the Belgian «excess profit» regime as State aid, stating that the Commission did not satisfy its burden to prove that the measure constituted a scheme. EGC, 14 February 2019, *Kingdom of Belgium v. Commission*, T-131/16.

[23]Commission, press release No. IP/17/5343. Available at http://europa.eu/rapid/press-release_IP-17-5343_en.htm.

[24]Commission Decision of 1 October 2014, *Case SA.34914 UK Gibraltar corporate tax regime* [hereinafter *Alleged Aid by Gibraltar*]. Available at http://ec.europa.eu/competition/state_aid/cases/250265/250265_1784365_398_2.pdf.

[25]Commission Decision of 19 December 2019, *Case SA.34914 UK Gibraltar corporate tax regime* [hereinafter *Aid by Gibraltar*]. Available at http://ec.europa.eu/competition/state_aid/cases/250265/250265_2042846_607_2.pdf.

[26]Commission, press release No. IP/18/5831. Available at http://europa.eu/rapid/press-release_IP-18-5831_en.htm.

[27] *DG-Comp Working Paper*, *supra* note 10, para. 7.

may be made to undertakings defined within the act in a general and abstract manner and any act on the basis of which aid, which is not linked to a specific project, may be awarded to one or several undertakings for an indefinite period of time and/or for an indefinite amount".[28]

It cannot be excluded that future State aid investigations will target favorable measures granted in the context of cooperative compliance. Such programs have been adopted in various member States[29] in order to promote a relationship between the taxpayer and the tax administration based on cooperation, transparency and disclosure "in exchange for certainty", rather than the traditional adversarial one.[30] In particular, the OECD has identified seven pillars on which cooperative compliance models are usually built: on the one side, the taxpayer is expected to grant transparency and disclosure; on the other side, commercial awareness, impartiality, proportionality, openness and responsiveness are expected from the tax administration. Moreover, the switch from a traditional control approach to a cooperative one is often

[28] Article 1(d) of Regulation No. 2015/1589. The case law of the Union Courts does not provide guidance on the interpretation of the definition of "aid scheme". In the final decision on Belgium's "excess profit scheme", the Commission notes, however, that the Union Courts have in the past accepted the Commission's qualification of tax measures sharing many characteristics with the contested schemes as aid schemes within the meaning of that provision. *See* Commission Decision of 11 January 2016, Case SA.37667 *Excess profit tax ruling system in Belgium*, para. 19. Available at http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_37667; ECJ, 22 June 2016, *Belgium and Forum 187 ASBL v. Commission*, joined cases C-182/03 and C-217/03; ECJ, 17 September 2009, *Commission v. Koninklijke FrieslandCampina*, C-519/07P. When targeting aid schemes, the Commission must preliminarily demonstrate that the contested set of measures falls within the scope of the aforementioned article 1(d) of Regulation No. 2015/1589. In particular, (i) the investigation must identify an act on the basis of which aid can be awarded, (ii) the act should not require any further implementing measures and (iii) should define the potential aid beneficiaries in a general and abstract manner.

[29] *See* Tropea, A. (2018). I profili giuridici dell'adempimento collaborativo. *Rivista trimestrale di diritto tributario*, *3–4*, 814; Szudoczky, R., & Majdanska, A. (2017). Designing Co-operative Compliance Programmes: Lessons from the EU State Aid Rules for Tax Administrations. *British Tax Review*, *2*, 208; Bronżewska, K. (2016). *Cooperative compliance: a new approach to managing taxpayer relations.* Amsterdam: IBFD, 93; OECD, *Co-operative Compliance: A Framework: From Enhanced Relationship to Co-operative Compliance*, OECD, Paris (2013). Available at https://read.oecd-ilibrary.org/taxation/co-operative-compliance-a-framework_9789264200852-en; and Id., *Study into the Role of Tax Intermediaries*, OECD, Paris (2008).

[30] Szudoczky, R., & Majdanska, A., *supra* note 29, 204.

the result of the development of a compliance risk management strategy,[31] which is supposed to benefit both parties in terms of lower administrative and compliance costs.

However the subjective scope of these programs raises concerns of incompatibility with the State aid framework, because, in most cases, they are available only to selected taxpayers (mainly large businesses). The suspicion is exacerbated by the fact that these regimes are designed in a way that may—directly or indirectly—lower the overall tax burden of the participants. Advantages may be represented by a reduction or waiver of the penalties on unpaid taxes or by postponements of taxes (that confer a cash flow to the benefit of the participants).[32]

15.2 The Risk of Recovery and the Protection of Legitimate Expectations: Open Issues Under Judicial Review

The legal issues arising from the investigations on fiscal aids granted by means of tax rulings are no small matter, with the protection of legitimate expectations being just one example.

The undue aids are to be recovered from the addressee of the tax ruling granting them, in order to restore the *ex ante* situation. Otherwise the undertaking benefitting from them would keep the advantage over its competitors and the obstacle (or potential harm) to competition between the Member States would not be removed.

However, from another perspective, it is the State that has failed to comply with the procedure laid down in Art. 108(3) TFEU. Accordingly, the Member States, prior to granting any measure in favor of certain undertakings, have to inform the Commission—in sufficient time to enable it to submit its comments—of any projected aid or plan to alter existing measures (notification obligation) and they shall not put their plans into effect until the procedure laid down in Art. 108(2) TFEU has resulted in a final decision (standstill clause).

[31] OECD, *Co-operative Compliance: A Framework: From Enhanced Relationship to Co-operative Compliance*, *supra* note 29, 29.

[32] Szudoczky, R., & Majdanska, A., *supra* note 29, 213. *See* also Bronżewska, K. (2016), *supra* note 29, 357, who addresses the risks related to the use of discretionary powers by the tax authorities within cooperative compliance programs.

A failure by the State results, therefore, in a financial burden that must be entirely borne by the undertaking. While this in the case in any scenario of aids' recovery, regardless of the ground (fiscal, commercial, labor, etc.) and nature of the aids, this circumstance appears to be particularly striking when the aids have been granted by means of tax rulings. Undue fiscal aids may, in principle, be harder to recover than aids of a different kind: in fact, the State aid framework has originally been designed for "positive" subsidies,[33] while the recovery of taxes that the State has renounced to impose ("negative" measure) requires a greater effort in terms of quantification and levy. What is making the economic operators even more uncomfortable is the circumstance that not only favorable measures were granted by a functional body of the State as the tax administration but also that such measures were confirmed in individual administrative acts (advance rulings, letter rulings, APAs, etc.) directly addressed to them.

In this respect, it has been argued that the retroactive recovery of unlawful State aids may de facto result in a situation in which undertakings, rather than turning to national tax authorities, will instead "seek guidance from the Commission prior to investment to get the required certainty, which is a shift in legal sovereignty".[34] The main counterargument to this clearly widespread perception is that Member States

[33]Maitrot De La Motte, A. (2017). Tax Recovery of the Illegal Fiscal State Aids: Tax Less to Tax More. *EC Tax Review*, *2*, *77*, after dealing with the procedural and technical difficulties of fiscal aids' recovery, seems to also question the constitutional grounds of the recovery in this field on the basis of the principle of "no taxation without representation". This objection, though clear and appealing, can be overcome considering that the State aid framework is provided by the TFEU, that all Member States have agreed on, thus yielding a portion of sovereignty. Therefore, it is true that taxation is usually covered in modern democracies by the rule of law, but the Commission's power to review all forms of aids, fiscal ones included, is fully compliant with it. As observed by Miladinovic, A., it is true that «Member States did not want to give up their sovereignty in direct tax matters […] nevertheless, the Member States need to respect EU principles and cannot use their tax sovereignty as an excuse to disregard the main rules, particularly the State aid prohibition». *See* Miladinovic, A. (2018). The State Aid Provisions of the TFEU in Tax Matters. In M. Lang, P. Pistone, J. Schuch, & C. Staringer (Eds.), *Introduction to European Tax Law on Direct Taxation* (pp. 109–110). Wien: Linde.

[34]Forrester, E. (2018). Is the State Aid Regime a Suitable Instrument to Be Used in the Fight Against Harmful Tax Competition? *EC Tax Review*, *27*, 33.

already have an upstream obligation to notify the Commission with projected aids and to comply with the standstill clause until their compatibility with the internal market is ascertained. The fact that in the cases at hand the MNEs involved had already received confirmation in the rulings issued by the tax authorities was not enough to rule out legal uncertainty. Indeed, the circumstance that favorable measures were not only granted by a functional body of the States but also confirmed in individual administrative rulings did not exempt the State from following the procedure laid down in Art. 108. However, it cannot be denied that the financial consequences of the infringement by the State are endured by companies that were supposed to be supported, which have to repay the aids with interest.[35]

For these reasons the MNEs involved have challenged the Commission decisions before the General Court (EGC),[36] invoking the principles of legal certainty and legitimate expectations, in order to rule out the order of recovery. The breach of general principles of Union law, together with the expiry of the limitation period[37] and the absolute impossibility, is one of the three situations that would exempt

[35] Maitrot De La Motte, A., *supra* note 33, 88, concludes that "at the end of the process, the offending State has been enriched and the 'aided' company has become poorer. It would be otherwise only if the Court of justice granted the possibility of incurring State responsibility".

[36] Action brought on 22 May 2018, *Amazon EU and Amazon.com v. Commission*, T-318/17, 7th and 8th plea in law; Action brought on 19 December 2016, *Apple Sales International and Apple Operations Europe v. Commission*, T-892/16, 11th plea in law; Action brought on 29 December 2015, *Fiat Chrysler Europe v. Commission*, T-759/15, 3rd and 4th plea in law. The Member States involved in the investigations are invoking the aforementioned principles as well. It may sound paradoxical the circumstance that they are opposing the Commission's orders to recover—and keep—the back taxes with interests. However Fregni, M. C. (2017) (Mercato unico digitale e tassazione: misure attuali e progetti di riforma. *Rivista di diritto finanziario e scienza delle finanze*, *LXXVI*(1), I, 74) notes that, on the one side, the recovered amounts would not be available as viable resources before the electorate, because, according to the EU rules, they would be allocated to lower the government debt; on the other hand, the States fear to lose their attractiveness for cross-border investments (as those performed by the MNEs involved in the pending cases). *See* action brought on 30 December 2015, *Luxembourg v. Commission*, T-755/15, 3rd plea in law; action brought on 9 November 2016, *Ireland v. Commission*, T-778/16, 7th plea in law; action brought on 14 December 2017, *Luxembourg v. Commission*, T-816/17, 5th plea in law.

[37] Ten years since the date, the aid was granted.

the Member States from the obligation of recovery (Art. 16-17 of Regulation No. 2015/1589).

The legal certainty and the legitimate expectations are two general principles of EU law. Despite being closely related to each other, their scope is slightly different.

The ECJ has defined the legal certainty as the principle "which requires that legal rules be clear and precise, and aim to ensure that situations and legal relations governed by Community law remain foreseeable".[38] If compared to the principle of legal expectations, the scope of legal certainty is wider, because it does not require a prior declaration of the EU institutions: in accordance with the case law of the Union Courts,[39] instead, citizens are protected by the principle of legitimate expectations when they reasonably trust in the maintenance or stability of a given legal situation created through an administrative or legislative act of the institutions, a reiterated legal practice or interpretation or even certain oral or written declarations.[40]

Although the tax authorities issuing the rulings may have created legal expectations at a domestic level with regard to the confirmed measures, the same is not obvious at the EU level. Indeed, since *Commission v. Germany*, the CJEU has held that "in view of the mandatory nature of the supervision of State aid by the Commission under Article 93 of the Treaty, undertakings to which an aid has been granted may not, in principle, entertain a legitimate expectation that the aid is lawful unless it has been granted in compliance with the procedure laid down in that article. A diligent businessman should normally be able to determine whether

[38] ECJ, 15 February 1996, C-63/93, *Duff and others*, para. 20. *See* also the EGC, 12 September 2007, T-348/03, *Friesland Foods v. Commission*, para. 125.

[39] *See*, *ex multis*, ECJ, 11 March 1987, *Van der Bergh en Jurgens BV v. Commission*, C-265/85, para. 45; Id., 12 November 1987, *Ferriere San Carlo s.p.a. v. Commission*, C-344/85, para. 13; *Id*., 12 November 1987, *Ferriere San Carlo s.p.a. v. Commission*, C-344/85, para. 13; Id., 26 June 1990, *Sofrimport v. Commission*, C-152/88, para. 22; *Id*., 15 April 1997, *Irish farmers Association and others v. Minister for Agricolture, Food and Forestry, Ireland y Attorney General*, C-22/94, para. 17; Id., 14 September 1995, *Lefebvre and others v. Commission*, C-571/93, paras. 73–74; and Id., 14 October 2010, *Nuova Agricast S.r.l. and Cofra S.r.l. v. Commission*, C-67/09, para. 71.

[40] Pastoriza, J. S. (2016). *The Recovery Obligation and the Protection of Legitimate Expectations: The Spanish Experience*. In I. Richelle, W. Schön, & E. Traversa (Eds.), *State aid Law and Business Taxation*. Berlin-Heidelberg: Springer, 254.

that procedure has been followed".[41] Besides, the extensive audit of the Commission on tax rulings may have been foreseen by the economic operators, based on the guidance provided by the Commission and the Code of Conduct Group, respectively in 1998[42] and 2010.[43] Therefore, it is unlikely that the principle of legitimate expectations will rule out the obligation of recovery, if the procedure of prior notification of the aid to the Commission (currently laid down in Art. 108 TFEU) has not been followed.[44]

Similarly, with regard to legal certainty, the CJEU settled case law provides that "so long as the Commission has not taken a decision approving aid and also so long as the period for bringing an action against such a decision has not expired, the recipient cannot be certain as to the lawfulness of the proposed aid which alone is capable of giving rise to a legitimate expectation on his part. It follows that the Commission did not infringe the principles of protection of legitimate expectations and legal certainty".[45]

Considering the unfavorable case law on the application of these general principles when the procedure *ex* Art. 108 TFEU has not been followed, it is essential to minimize the risk of recovery. The starting point to manage this risk is the identification of the most recurrent practices of tax arbitrage confirmed in the contested rulings and of the procedural flaws in their issuance. This identification allows to establish the measures to counter the risk of recovery for those undertakings that have been granted tax rulings in the past years by the tax authorities of the Member States.

[41] ECJ, 20 September 1990, *Commission v. Federal Republic of Germany*, C-5/89, para. 14; ECJ, 11 November 2004, *Demesa e Territorio Històrico de Alava v. Commission*, C-183/02 and C-187/02, para. 52; and EGC, 22 April 2016, *France v. Commission*, T-56/06 RENV II, para. 84.

[42] *1998 Commission Notice*, *supra* note 4, paras. 21–22.

[43] Code of Conduct Group, *Guidance on the identification of harmful tax rulings*, agreed on 22 November 2010, doc. 16766/10.

[44] *See* Falsitta, G. (2010). Recupero retroattivo degli 'aiuti di stato' e limiti della tutela dei principi di capacità contributiva e di affidamento [nota a Corte cost., ord. n. 36/2009]. *Rivista di diritto tributario*, *11*(II), 672. *Contra*, Forrester, E., *supra* note 34, 32; Giraud, A. (2008). A Study of the Notion of Legitimate Expectations in State Aid Recovery Proceedings: "Abandon All Hope, Ye Who Enter Here"? *Common Market Law Review*, *45*, 1426–1427.

[45] ECJ, 29 April 2004, *Commission v. Italy*, C-91/01, paras. 66–67.

15.3 Measures of Tax Arbitrage and Procedural Flaws in the Issuance of Rulings Identified by the Commission's Investigations

The following sections provide an overview of the recurrent measures of tax arbitrage and procedural flaws in the issuance of individual rulings outlined in the Commission's preliminary and final decisions (when available), in order to better comprehend what is the object of tax rulings likely to give rise to a State aid dispute.

The OECD defines tax arbitrage as the process of entering into tax motivated transactions, i.e. to obtain profit from the application of tax rules.[46] As will be further discussed, the Commission's investigations show that certain multinational groups, endorsed by tax authorities, have been exploiting the differences between national tax systems to substantially lower their overall tax burden, reaching, at times, the point of double non-taxation.

15.3.1 Transfer Mispricing

Since most of the contested rulings are APAs, the Commission's review revolves around the transfer pricing arrangements to determine the corporate group entities' taxable profits. In particular, this assessment is crucial to establish whether the aid has been selectively granted to the undertaking in question. In fact, the Commission claims that, in the case of an individual aid measure, the identification of the economic advantage is, in principle, sufficient to support the presumption that it is selective, without it being necessary to analyze the selectivity of the measure according to the three-step selectivity analysis devised by the Court of Justice for State aid schemes (1. identification of the appropriate reference framework; 2. assessment of a deviation from that reference system, in so far as the measure differentiates between operators who, in the light of the objective pursued by that system, are in a comparable factual and legal situation; 3. assessment of the justification in light of the nature or

[46] OECD, *Arbitrage, Tax*, Glossary of Tax Terms. Available at http://www.oecd.org/ctp/glossaryoftaxterms.htm. *See* also Avi-Yonah, R. S. (2007). Tax Competition, Tax Arbitrage and the International Tax Regime. *Bulletin for International Taxation*, *61*(4), 137.

general scheme of the system).[47] Therefore, the Commission considers the selectivity requirement to be met,[48] if it succeeds in demonstrating that an individual ruling confers an economic advantage on its addressee by endorsing a transfer pricing arrangement that produces an outcome departing from a reliable approximation of a market-based outcome, resulting in an undue reduction of the tax base. This might be the case when the transfer pricing arrangement confirmed by means of the APA is not at arm's length because the methodology endorsed by the ruling produces an outcome that departs from a reliable approximation of a market-based outcome or if the ruling allows its addressee to use alternative, more indirect methods for calculating taxable profits, while direct ones are available.

In order to assess the advantage in cases involving transfer pricing methods, the Commission has taken as guidance the Transfer Pricing Guidelines adopted by the OECD in 2010 and, most recently,[49] those released in 2017. This circumstance is likely to raise an even stronger criticism by the concerned Member States and MNEs with regard to legal certainty and the protection of legitimate expectations, as the Commission seems to be retroactively enforcing non-binding guidance.[50]

[47] *See* Ismer, R., & Piotrwki, S. (2015). The Selectivity of Tax Measures: A Tale of Two Consistencies. *Intertax*, *43*, 559.

[48] However the Commission usually develops a subsidiary line of reasoning by examining the individual tax rulings against the aforementioned three-step selectivity test to demonstrate that it is also selective under that analysis.

[49] Commission Decision of 4 October 2017, Case SA.38944 *Aid to Amazon* [hereinafter *Aid to Amazon*], rec. 249. Available at http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_38944.

[50] *See* Action brought on 22 May 2018, *Amazon EU and Amazon.com v. Commission*, T-318/17: "Eighth plea in law, alleging that the decision violates the principles of legal certainty, retroactivity, and non-discrimination, and an essential procedural requirement because it assesses the validity of the 2003 ATC by reference to post-dating OECD Guidelines. The decision retroactively and discriminatorily applies, and improperly holds the applicants and Luxembourg to, standards in the 2017 OECD Guidelines on transfer pricing first issued after the Commission opened the procedure under Article 108(2) TFEU, and long after the adoption of the 2003 ATC". *See* also action brought on 14 December 2017, *Luxembourg v. Commission*, T-816/17, 5th plea in law: "the recovery of the aid is incompatible with the principle of legal certainty, taking into account the good faith of the Grand Duchy of Luxembourg in the application of transfer pricing and the fact that the new transfer pricing approach applied by the Commission in the contested decision could not have been foreseen".

In its negative decisions the Commission has found that the prices endorsed by the APAs for certain inter-company transactions did not comply with the "arm's length principle" (ALP), according to which "[Where] conditions are made or imposed between the two [associated] enterprises in their commercial or financial relations which differ from those which would be made between independent enterprises, then any profits which would, but for those conditions, have accrued to one of the enterprises, but, by reason of those conditions, have not so accrued, may be included in the profits of that enterprise and taxed accordingly" (Article 9(1) of the OECD Model Tax Convention on Income and on Capital).[51] However, it must be noted that the Commission stressed in both the 2016 Notice[52] and the *Apple* final decision[53] that it does not directly apply the OECD's guidelines, even though it may have reference. Nonetheless, it underlined repeatedly that "if a transfer pricing arrangement complies with the guidance provided by the OECD Transfer Pricing Guidelines, […] a tax ruling endorsing that arrangement is unlikely to give rise to state aid".[54]

The main findings of the Commission relate to the appropriateness of the methods used in the APAs to determine the arm's length prices of intragroup transactions.

For instance, in *Fiat*, the Commission questioned the appropriateness of the method—proposed by Fiat Finance and Trade's tax advisor and accepted by Luxembourgish tax authorities—to estimate the company's remuneration for its activities (mainly financial services, such as intercompany loans): in the transfer pricing analysis, an indirect method had

[51] For an in-depth analysis on the application of the ALP by the Commission, *see* Mason, R. (2017). Tax Rulings as State Aid—Part 4: Whose Arm's-Length Standard? *Tax Notes*, *155*(7), Virginia Law and Economics Research Paper No. 2017-19. Available at https://ssrn.com/abstract=2990603; Wattel, P. J. (2016). Stateless Income, State Aid and the (Which?) Arm's Length Principle. *Intertax*, *44*, 791; and Boccaccio, M. (2017). L'evoluzione della politica della Commissione su aiuti di Stato e ruling fiscali. *Rivista di diritto finanziario e scienza delle finanze*, *LXXVI*(2), I, 224.

[52] *2016 Commission Notice*, *supra* note 17, para. 173.

[53] Commission Decision of 30 August 2016, Case SA.38373 *Aid to Apple*, rec. 255 [hereinafter *Aid to Apple*]. Available at http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_38373.

[54] *2016 Commission Notice*, *supra* note 17, para. 173; *DG-Comp Working Paper*, *supra* note 10, para. 18. *See* Thomson, A., & Hardwick, E. (2017). The European Commission's Application of the State Aid Rules to Tax: Where Are We Now? *Journal of Taxation of Investments*, 45.

been used, the transactional net margin method, while the Commission, pursuant to the case law[55] and the OECD guidelines,[56] regards direct methods as preferable. In particular, the most appropriate method in this case would have been the uncontrolled price method that should be preferred in cases where comparable transactions can be observed on the market, as those identified by the Commission decision.[57]

Conversely, in *Amazon*, the Commission found the uncontrolled price method to be inappropriate, rejecting the comparability of agreements that the group considered sufficiently established by the U.S. Tax Court to value intangibles such as payments to contribute to the costs of developing the intellectual property. Instead, the Commission claims the transactional net margin method should apply.[58] It is interesting to note how the Commission replies to the argument of Luxembourg and Amazon that, because transfer pricing is not an exact science, the assessment by the Commission of the transfer pricing arrangement endorsed by the contested tax ruling should necessarily be limited. The Commission recalls that the approximate nature of transfer pricing has to be viewed in the light of its objective: "The objective of transfer pricing is to find a reasonable estimate of an arm's length outcome on the basis of reliable information. The pursuit of that objective would be impossible if the approximate nature of the transfer pricing analysis could be invoked to justify a transfer pricing arrangement producing an outcome that departs from a reliable approximation of a market-based outcome. Similarly, Luxembourg's argument that the Commission, in undertaking such an assessment, improperly replaces the Luxembourg tax administration in the interpretation of national tax law, if accepted, would remove fiscal measures in general and transfer pricing rulings in particular from the scrutiny of the State aid rules".[59]

The Commission's line of reasoning on transfer pricing is currently under judicial review, as the States and the MNEs involved claim that the

[55] *See* ECJ, 22 June 2016, *Belgium and Forum 187 ASBL v. Commission*, joined cases C-182/03 and C-217/03, para. 95.

[56] OECD (2010), *Transfer Pricing Guidelines*, para. B.2.3.

[57] Commission Decision of 21 October 2015, Case SA.38375 *Aid to Fiat*, rec. 132. Available at http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_38375.

[58] *Aid to Amazon*, *supra* note 49, rec. 542.

[59] *Ivi*, rec. 404–405.

decisions are in breach of Art. 296 (2) TFEU and Art. 41(2)(c) of the Charter of Fundamental Rights of the EU, as the Commission failed to explain how it derived the arm's length principle from EU law, "or even what the principle is".[60]

In this respect, it has been argued that the ALP may be used as a benchmark, or as part of the reference framework to determine whether the measure is selective,[61] only when it is included in the domestic tax system.[62] While in most of the States involved in the investigations, the ALP is embedded in the domestic law, the reasoning of the Commission may be questioned when no transfer pricing rules exist or when they do not implement the ALP. That being the case of Ireland (up to 2010), the Commission's reasoning is apparently weak. It is indeed difficult to claim that the tax administration derogated from the normal tax system, when the principle in question is not part of it.[63] However, the counter-argument could be that the ALP forms part of the international tax regime included in customary international law, thus affecting the Irish tax system as well. In fact, it cannot be denied that the principle has achieved an internationally recognized status, given that it has been applied for decades in most tax treaties to the matter of transfer pricing and is the guiding principle in the OECD soft law.[64] This theory

[60] Action for annulment brought on 29 December 2015, *Fiat Chrysler Finance Europe v. Commission*, T-759/15.

[61] *See* Cachia, F. (2017). Analyzing the European Commission's Final Decisions on Apple, Starbucks, Amazon and Fiat Finance & Trade. *EC Tax Review*, *1*, 33; Ismer, R., & Piotrwki, S., *supra* note 47, 559.

[62] Ibid.

[63] Action for annulment brought on 9 November 2016, *Ireland v. Commission*, T-778/16, second plea in law: "The Commission also wrongly claims that the Opinions were selective. The Commission's reference system wrongly ignores the distinction between resident and non-resident companies. The Commission attempts to re-write the Irish corporation tax rules so that, in respect of Opinions, the Revenue Commissioners should have applied the Commission's version of the arm's length principle ('ALP'). This principle is not part of EU law or the relevant Irish law in relation to branch profit attribution, and the Commission's claim is inconsistent with Member State sovereignty in the area of direct taxation".

[64] Avi-Yonah, R. S., *supra* note 46, 137; Lepard, B. D. (1999). Is the United States Obligated to Drive on the Right? A Multidisciplinary Inquiry Into the Normative Authority of Contemporary International Law Using the Arm's Length Standard as a Case Study. *Duke Journal of Comparative & International Law*, *43*, 57–58.

has been debated at length, opposed by those[65] who claim that there is no international tax regime providing principles that are inherent every domestic system and that each country is therefore free to pursue its own tax interest. It will be interesting to see if and how the Union Courts will engage in this debate, when addressing the mentioned plea.

15.3.2 Mismatches in the Classification of Entities

Following the assessment on transfer pricing arrangements, the Commission verifies whether the profit allocation endorsed in the rulings lowered the tax liability of the entities based in the concerned Member State as compared to the liability of undertakings in a similar legal and factual situation.

In *Amazon* and *Apple* the Commission found that, due to a difference in the Member States and US tax rules on entities' characterization or residence, these corporate groups shifted their profits to EU-based group entities that were neither liable to pay taxes in the EU nor in the US.

For instance, in *Amazon*,[66] the Commission found that Amazon EU, a Luxembourg-based corporation that recorded the profits from all European sales, paid an "exaggerated" royalty to LuxSCS, a limited liability partnership also based in that State, but transparent for Luxembourg tax purposes. While the royalty was deducted from the tax base of Amazon EU in Luxembourg, the profits shifted to LuxSCS were supposedly to be taxed at the level of the US partners, provided that, according to the contested ruling, LuxSCS did not have any permanent establishment in Luxembourg. However, the US partners deferred taxation indefinitely[67] by regarding LuxSCS as a separate corporate entity resident in Luxembourg. Indeed, pursuant to US "Check-the-box" regulation, US MNEs may choose to treat, for US tax purposes, certain CFCs either as partnerships (fiscally transparent) or as corporations (fiscally nontransparent). In the latter case, the profits attributed to the

[65] Cachia, F., *supra* note 61, 34; Vann, R. J. (1998). International Aspects of Income Tax. In V. Thurony (Ed.), *Tax Law and Drafting* (vol. 2, 718). The Hague: Kluwer Law International.

[66] Ibid.

[67] Commission Decision of 7 October 2014, *Case SA.38944 Alleged Aid to Amazon*, note 21, 8 [hereinafter *Alleged Aid to Amazon*]. Available at http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_38944.

entity are disregarded, as if they belonged to a separate corporate entity resident in the foreign country, and taxation in the US is deferred indefinitely, so long as none of the said profits are repatriated to the US.[68]

In *Apple*, the mismatch related to the residency Apple Sales International (ASI) and Apple operations Europe (AOE), Irish incorporated entities that are fully owned by the Apple group and ultimately controlled by the US parent (Apple Inc.). Most of the profits generated by sales of Apple products in the EU were recorded by ASI's head office; ASI and AOE, as remuneration for the rights to use Apple's IP to sell and manufacture outside America, made yearly payments to Apple in the US to fund research and development.[69] These payments were deducted from the profits recorded in Ireland.[70] The group tax base was further reduced as a result of ASI's head office being "stateless" for tax residency purposes. In fact, although ASI and AOE did not have any taxable presence in any other tax jurisdiction beside Ireland during the time that the contested rulings were in force, the Irish Revenue, in application of Section 23A TCA 97, considered them to be managed and controlled in the US.[71]

The US Senate Subcommittee on Investigation in 2013 released a bipartisan memorandum[72] and held a hearing showing how Apple had "established and directed tens of billions of dollars to at least two Irish affiliates, while claiming neither is a tax resident of any jurisdiction, including its primary offshore holding company, Apple Operations International (AOI), and its primary intellectual property rights recipient, Apple Sales International (ASI). AOI, which has no employees, has no physical presence, is managed and controlled in the United States, and received $30 billion of income between 2009 and 2012, has paid no

[68] *Aid to Amazon*, *supra* note 49, rec. 155, note 119.

[69] Commission, press release No. IP/16/2923. Available at http://europa.eu/rapid/press-release_IP-16-2923_en.htm.

[70] Ibid.

[71] *Aid to Apple*, *supra* note 53, rec. 51–52.

[72] US Senate Subcommittee on Investigation, *Offshore Profit Shifting & Apple*, Memorandum (21 May 2013), 5. *See* also https://www.revenue.ie/en/companies-and-charities/corporation-tax-for-companies/corporation-tax/company-residency-rules.aspx; Furthermore, the Memorandum released by the Subcommittee offered recommendations to strengthen US transfer pricing rules and reform the so-called "check-the-box" and "look-through" loopholes that enable multinationals to shield offshore income from US taxes.

corporate income tax to any national government for the past five years". It further explained that this was made possible "since Ireland bases tax jurisdiction over companies that are managed and controlled in Ireland, and the US bases tax residency on where a company is incorporated".[73] As a result, Apple exploited the gap between the two, shifting the profits to their subsidiaries that enjoyed double non-taxation.

15.3.3 Procedural Flaws

With regard to the procedure governing the national ruling systems, the Commission's investigations have identified discretionary administrative practices of the tax authorities when confirming the profit allocation.

In *Apple*, the Commission found that the tax base in the first ruling was "negotiated rather than substantiated by reference to comparable transactions"[74] and that "the authorities did not seem to have had the intention of establishing a profit allocation based on transfer pricing",[75] as the profits of the branch of AOE were calculated "on the basis of actual costs without this choice being reasoned in any way". Moreover, the Irish Revenue did not provide the Commission with any transfer pricing report (which is a common manner by which a transfer pricing proposal is made to tax authorities) to support the calculation at hand.[76] Discretion—increasing the risk of negotiation—is one of the main circumstances that led the Commission to qualify the profit allocation to ASI and AOE as a selective advantage.[77] In this respect, according to the ECJ case law, negotiation alone does not suffice in determining the selective nature of an advantageous measure[78]: it is weighted—among other factors—as a circumstance indicative of selectivity. The Union

[73] US Senate Subcommittee on Investigation, *Activities Report of the Permanent Subcommittee on Investigations for the 113th Congress*, Memorandum (December 2014).

[74] Commission Decision of 11 June 2014, *Case SA.38373 Alleged aid to Apple*, rec. 58 [hereinafter *Alleged aid to Apple*]. Available at http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_38373.

[75] Ibid.

[76] *Ivi*, rec. 59.

[77] *Aid to Apple*, *supra* note 53, rec. 150: the «favourable position selectively granted to the two undertakings [is considered to be] based on the discretion of Irish Revenue which went beyond the simple management of tax revenue by reference to objective criteria».

[78] ECJ, 4 June 2015, C-15/14, *European Commission v. MOL Magyar Olaj-es Gazipiari Nyrt*, para. 66.

Courts are thus called to establish whether the national legislation confers a margin of assessment on national authorities with regard to the detailed rules for the application of the measure and, if so, whether such discretion is limited by objective criteria related to the tax system[79] or it is so broad that it can lead to the grant of an advantage in favour of a specific economic operator[80] (for instance, taking into consideration criteria unrelated to the tax system, such us maintaining employment).[81] Additionally, the Commission pointed out that the 1991 ruling, whose duration was much longer than the usual length of APAs concluded by other Member States, remained in force too long to ensure reliable results: "Even if the initial agreement was considered to correspond to an arm's length profit allocation, *quod non*, the open-ended duration of the 1991 ruling's validity calls into question the appropriateness of the method agreed between Irish Revenue and Apple to arrive to that allocation in the latter years of the ruling's application, given the possible changes to the economic environment and required remuneration levels".[82]

Similarly, in *Amazon*, the contested ruling remained in force more than ten years without any revision.[83]

Besides the investigations performed by the Commission, the hundreds of tax rulings issued by Luxembourgish tax authorities and made public in 2014 by The International Consortium of Investigative Journalists (the so-called "LuxLeaks" scandal) also provide food for thought. Omri Marian[84] has analyzed an original dataset, generated from a hand-coded sample of 172 of the leaked advance tax agreements, finding, *inter alia*, that (strikingly) "Sixty-eight of the ATAs, about 40% of the ATAs for which data are available, were approved the same day of the submission. Eleven of the ATAs, 11.22% of the ATAs for which data

[79] ECJ, 18 July 2013, C-6/12, *P Oy*, para. 27.

[80] ECJ, 4 June 2015, C-15/14, *European Commission v. MOL Magyar Olaj-es Gazipiari Nyrt*, para. 65.

[81] ECJ, 18 July 2013, C-6/12, *P Oy*, para. 27.

[82] *Ivi*, rec. 65.

[83] *Alleged aid to Amazon*, *supra* note 67, rec. 76. *Aid to Amazon*, *supra* note 49, rec. 306 and 325.

[84] Marian, O. (2017), The State Administration of International Tax Avoidance. *Harvard Business Law Review, 7*, 201; UC Irvine School of Law Research Paper No. 2015-95.

are available, were approved the same day that the taxpayer apparently first engaged LACD [*Administration des Contributions Directes*]".[85] One might think that the issuing office was so well structured and efficient that the assessment was performed in such a short time. Instead, responsible for the whole process was a single administrator, which further exacerbates the suspicion that, in many instances, the Luxembourgish tax administration did not give substantive consideration to the contents of the submission.[86]

15.4 Managing the Risk of Recovery: A Matter of Tax Governance and EU Policy

As shown in the previous sections, the contested measures endorsed in the tax rulings and certain procedural flaws in their issuance appear to be rather recurrent.

For instance, more than once the Commission has noted that the issuance of the rulings was not based on a transfer pricing report[87] or that the remuneration confirmed therein was not consistent with the relevant case law and soft law nor compliant with the ALP.

A recurrent measure indicative of tax arbitrage is represented by the "inflated" royalties paid (and thus deducted) by the EU-based entities to other EU-based entities that were transparent for tax purposes: due to a mismatch in the classification of the latter (transparent/nontransparent) between the Member States and the US, where the partners of such entities reside, these profits were "disregarded" for tax purposes in the US as well, remaining largely untaxed.

As far as the administrative practices are concerned, the investigations have shown that the tax authorities have sometimes enjoyed discretion when establishing the profit allocation. In *Apple*, the Commission found that the tax base in the first ruling was "negotiated rather than substantiated by reference to comparable transactions".[88] In addition, despite the evolving market conditions, some of the contested rulings remained in force even 10 or 15 years without undergoing any revision.

[85] *Ivi*, 220.

[86] *Ivi*, 217.

[87] *Alleged aid to Apple*, *supra* note 74, rec. 58; *Aid to Amazon*, *supra* note 49, rec. 63.

[88] *Alleged aid to Apple*, *supra* note 74, rec. 58.

The study carried out by Omri Marian on a sample of tax rulings issued by Luxembourgish tax authorities and made public in the so-called "LuxLeaks" scandal has shown that a large number of those rulings were approved the same day of the submission or the same day as the taxpayer apparently first engaged the tax administration. Similarly, in *Amazon*, the Commission pointed out that the contested ruling was granted within eleven working days from the receipt of the first letter constituting the ruling request.[89]

The undertakings that have been granted a ruling by the tax authorities of the Member States in the past (or are in the process of obtaining one) should thus beware of the following circumstances:

- inadequate evidence in support of the ruling request (e.g. lack of transfer pricing report);
- lack of compliance with the relevant EU provisions, Union Court's case law, OECD guidelines, resulting in a derogation from the general domestic tax rules (i.e. application of a more favorable tax treatment compared with other taxpayers in a similar factual and legal situation);
- issuance of a kind of tax ruling that is not available to undertakings in a similar legal and factual situation;
- non-compliance by the State with the procedure laid down in Art. 108 TFEU (lack of notification or violation of the standstill requirement);
- excessive duration of the ruling without undergoing any revision;
- ruling granted within a short time frame after the submission of the request.

Taking into account the high risk of investigation (and potential recovery of unlawful State aids),[90] in these cases it is worth considering the possibility of asking for a revision of the ruling. It is true that the revision

[89] *Aid to Amazon*, *supra* note 49, rec. 272.

[90] This a case in point for tax risk, which can be defined as the chance of undergoing a tax assessment—in the form of a State aid investigation—combined with the subsequent amount of revenue losses. *See* Marino, G. (2018). *La* Corporate Tax Governance *quale nuovo approccio culturale nei rapporti tra Fisco e contribuente*, in *Corporate Tax Governance*. Milano: Egea editore, 4; Valente, P., (2017). *Tax governance e tax risk management*. Milanofiori-Assago: Wolters Kluwer, 91. In the cases at hand, due to the extensive media coverage, the tax risk involves a high risk to reputation as well that can result in the so-called "tax shaming" or even in boycotts. *See* Barford, V., & Holt, G., (2013, May 21).

is not sufficient to rule out the risk of recovery (*an debeatur*) for the years in which the ruling has been operating. However, it would lower the *quantum* exposed to such risk, in an evolving framework where the automatic exchange of information and the country by country reporting (respectively focusing on the issuance of cross-border rulings and on the amount of revenue collected in any jurisdiction in which the MNE operates) make it easier than ever to cross-reference the data of each taxpayer doing a cross-border business.[91]

The risk of recovery of incompatible or unlawful State aids is also a matter of EU policy. As anticipated in the previous sections and well pointed out by Alexandre Maitrot de la Motte, "the main weakness of the State aid rules is that even if it is the State that violates European law by not notifying a project of aids, by granting them without authorization or by maintaining them contrary to a Commission decision, the

Google, Amazon, Starbucks: The rise of "tax shaming". *BBC News Magazine*. Available at https://www.bbc.com/news/magazine-20560359.

[91]The EU has been promoting a transparency policy, which requires national tax authorities to implement the automatic exchange of information on advance cross-border rulings and advance pricing arrangements. In particular, the Council adopted the Directives (EU) 2015/2376 and (EU) 2016/881 as regards mandatory automatic exchange of information in the field of taxation and country-by-country reporting. The first imposes to exchange information with a receiving administration, in respect of a cross-border ruling, within three months after its issuance (Art. 8a(5)(a) Directive (EU) 2015/2376). The latter extends the scope of the automatic exchange of information to the country-by-country reports, in which MNEs should provide annually and for each tax jurisdiction in which they do business the amount of revenue, profit before income tax and income tax paid and accrued. MNE groups should also report the number of their employees, stated capital, accumulated earnings and tangible assets in each tax jurisdiction. Finally, they should identify each entity within the group doing business in a particular tax jurisdiction and provide an indication of the business activities in which each entity engages. *See* OECD, *Countering Harmful Tax Practices More Effectively, Taking into Account Transparency and Substance, Action 5—2015 Final Report*, OECD/G20 Base Erosion and Profit Shifting Project, OECD, Paris (2015). Available at http://dx.doi.org/10.1787/9789264241190-en; Id., *Transfer Pricing Documentation and Country-by-Country Reporting, Action 13—2015 Final Report*, OECD, Paris (2015). Available at http://dx.doi.org/10.1787/9789264241480-en. *See* also Seer, D. R., & Wilms, A. L., (2016), Tax Transparency in the European Union Regarding Country by Country Reporting (BEPS Action 13). *EC Tax Review*, *5–6*, 325; Joint transfer pricing forum, *Statistics on APAs in the EU at the End of 2017*, JTPF/007b/2018/EN, meeting of 24 October 2018. Available at https://ec.europa.eu/taxation_customs/sites/taxation/files/statistics_on_advance_pricing_agreements_2017_en.pdf.

financial consequences are endured by companies that were supposed to be supported. They indeed have to repay them with interest. At the end of the process, the offending State has been enriched and the 'aided' company has become poorer".[92]

The Commission, based on the ECJ case law,[93] has often reminded the States and the economic operators that the recovery of unlawful and incompatible aids is not a penalty, but rather the logical consequence of the finding that it is unlawful.[94] However, even if the recovery is aimed at enforcing the EU policy on State aid by restoring the *ex ante* equilibrium, it results in the mentioned paradox. For this reason, the EU Institutions, starting from the Commission, should consider adopting a deterrent policy similar to that implemented by Art. 260(3) TFEU in case of failure by the national Parliaments to fully transpose a legislative Directive. This innovation, introduced in the Treaty of Lisbon, allows the Commission to propose financial penalties even when referring a case for the first time to the ECJ under Article 258 TFEU. In the field of the State aid review, a provision of this kind may incentivize the Member States to fully comply with the procedure laid down in Art. 108. At the same time, it would increase the effectiveness and immediateness of the recovery,[95] ensuring that the level-playing field in the internal market is maintained.

While the recovery of illegal or unlawful aids is correctly not considered as a penalty, a penalty would indeed be appropriate, in parallel, to counter the "beggar thy neighbor" behavior shown by the States in some of the cases at hand. This occurs, for instance, when a Member State sets up special schemes or adopts certain administrative practices which involve lower levels of taxation than generally apply in the State in question and are targeted to non-residents,[96] generating an unfair and harmful tax competition.

[92] Maitrot De La Motte, A., *supra* note 33, 88.

[93] ECJ, 17 June 1999, *Belgium v. Commission*, C-75/97, para. 65.

[94] Recovery Notice, *supra* note 6, para. 13.

[95] *Ivi*, para. 3.

[96] *See* Monti, M., *supra* note 3, 208. Marian, O., *supra* note 84, 203, defines this behavior, with specific reference to the course of action of the Luxembourgish tax administration, as "arbitrage manufacturing [,] a process in which, in return for a fee, a jurisdiction issues a regulatory instrument to a taxpayer who resides outside the jurisdiction, in respect of an investment located outside the jurisdiction. The regulatory instrument is designed to

Finally, the identification at the EU level of the recommended structure of the tax offices issuing the rulings (even by means of soft law) may improve the substantial, i.e. assessment of the ruling requests, granting adequate scrutiny and ruling out the single-administrator problem,[97] seen in the LuxLeaks scandal. In this respect, in 2016 the Code of Conduct Group has released guidelines on the conditions and rules for the issuance of tax rulings,[98] promoting standard requirements for the national ruling systems. Among these best practices, the Member States have agreed on the recommended organization of the offices that assess the ruling requests: at least two officials should be involved in the decision to grant a ruling or a two-level review should be performed. Higher caution is advisable in cases where the applicable rules and administrative procedures explicitly refer to discretion or the exercise of judgment by one of the relevant officials.[99]

15.5 Final Observations

The Commission's inquiry on State aids granted by means of tax rulings has raised complex legal issues, especially with regard to the legal certainty and the protection of legitimate expectations. Instead of increasing the degree of legal certainty—which is the usual expectation of taxpayers requesting a tax ruling—the cases at hand have resulted in a burdensome situation for the MNEs involved, perilous also for those undertakings that have been granted rulings in the past or that are seeking to obtain one by the tax authorities of the Member States. This is due to the fact that, while it is the State that has failed to comply with the notification

synthetically generate differences between the tax laws of the jurisdictions of source and residence. The taxpayer can then take advantage of the manufactured differences, and eliminate most of its tax liability on the profitable activity", suggesting that, while current efforts to counter tax avoidance are aimed at curtailing aggressive taxpayer behavior, such efforts should focus instead and also on certain rogue practices adopted by national tax authorities.

[97] Marian, O., *supra* note 84, 217.

[98] Code of Conduct Group, *Guidance on the conditions and rules for the issuance of tax rulings—standard requirements for good practice by Member States*, agreed on November 2016, doc. 14750/16.

[99] Ibid.

and standstill requirements, the financial risk of the recovery is entirely borne by the undertaking that was supposed to be supported.

The circumstances that raise a concern of incompatibility with the State aid rules are both substantial and procedural, as the Commission sees deficiencies in process as indicating potential problems with substance.[100] Taxpayers who have been issued a ruling in the past years should consider opting for a revision if they had not provided a transfer pricing report or if the remuneration confirmed therein was not consistent with the relevant EU provisions and OECD soft law nor compliant with the ALP. Moreover, we have witnessed the Commission taking a tough line against tax rulings endorsing an allocation of profits and/or of IP rights that resulted in a mismatch in the classification of EU-based entities (addresses of "inflated royalties) whose profits were "disregarded" for tax purposes both in the US and in the EU, remaining largely untaxed. Similarly, those undertakings doing a cross-border business that are in the process of obtaining a ruling should avoid incurring in similar situations. As far as administrative practices are concerned, red flags are raised especially by the non-compliance of the Member State with the procedure laid down in Art. 108 TFEU (lack of notification and/or violation of the standstill requirement), as well as by the excessive duration of the ruling without undergoing any revision or by the timing of certain tax administration that have issued tax rulings after few working days from the submission of the request.

However, in the present contribution it has been argued that the management of the risk of recovery should not be limited to the exclusive domain of the enterprises. Considering the limited chances of success of the pleas regarding the breach of legitimate expectations and of legal certainty before the Union Courts, it is worth considering the adoption of a deterrent policy similar to that implemented by Art. 260(3) TFEU in case of failure by the national Parliaments to fully transpose a legislative Directive. This innovation would allow the Commission to propose financial penalties even when referring a case for the first time to the ECJ under Article 258 TFEU, increasing the effectiveness and immediateness of the recovery, while preventing the Member States from granting derogatory rulings without notifying the Commission.

[100] Thomson, A., & Hardwick, E., *supra* note 54, 48.

In the meanwhile, the Member States' tax authorities should assess the taxpayers' ruling requests in light of the relevant domestic and international tax regulations and case law and the offices issuing the tax rulings should be structured in a way that ensures a thorough scrutiny, leaving no room for discretion.

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CHAPTER 16

Tax Risk Management Between Tax Authorities and Large Companies: The Cooperative Compliance Regime

Daniela Conte

16.1 The New Relations Between Tax Authorities and Large Companies Based on the Cooperative Compliance Regime

The tax law has reformed the relations between tax authorities and large companies, introducing into our legal system, the cooperative compliance regime.[1] This aims at building a new relational model based on the

[1]The discipline of the cooperative compliance regime is contained in the articles 3–7 of Legislative Decree of 5 August 2015, n. 128 (the so-called "Decree on legal certainty"). By means of these norms the Government has implemented the criteria on tax risk management contained in art. 6, paragraph 1, of delegated law n. 23 of 2014 aimed at creating a fairer, transparent and growth-oriented tax system. To complete the discipline of the CC regime, two measures were taken by the Director of the Revenue Agency: that of 14 April 2016, n. 54237 and that of 26 May 2017, n. 101573. On the CC regime, see G. Salanitro, *Profili giuridici dell'adempimento collaborativo tra la tutela dell'affidamento ed il risarcimento del danno*, in Riv. dir. trib., n. 5, 2016, 623 ss.

D. Conte (✉)
University Parthenope, Naples, Italy
e-mail: daniela.conte@uniparthenope.it

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exchange of "certainty" for "transparency" along the lines of cooperative compliance (CC) suggested by the OECD.[2] The provision of new forms of cooperation and enhanced relations marks the abandonment of the traditional scheme involving of the *ex post* control of income tax returns, based on the clear separation of duties and roles between the tax authority (controller) and the taxpayer (controlled), and the adoption of a new less conflictual and more collaborative relational model. This model is aimed at favoring, through steady and precautionary dialogues, the settlement of the less radical evaluative and interpretative divergences in order to evince the correct and spontaneous measurement of the tax base.

On the one hand, this new model will enable the taxpayer to overcome any interpretative uncertainty about circumstances of fact and law regarding the determination of the tax base and, therefore, to know what actions must be taken for declarative purposes in order not to infringe tax rules and principles during tax controls; on the other hand, the tax authority, as guarantor of the application of the tax law, will be able to recover the necessary coherence that the administrative action of taxation must ensure with respect to the substantive rules for determining the taxable base.[3] As is well known, in our legal system, the taxpayer has not always been able to expect a reasonable degree of certainty in advance regarding the tax treatment of the declared income. This has been so especially when the tax authority, in claims made about the abuse of the right, has used this principle to redevelop negotiation frameworks and corporate architectures based on their alleged contrast with the principles of domestic and community law and according to the mere

[2] Cf. G. Marino (Ed.) *Corporate Tax Governance*, Milan, 2018, 20 ss. On this subject reference may be made to the author's monograph, *Dal controllo fiscale sul dichiarato al confronto preventivo sull'imponibile. Dall'accertamento tributario alla compliance*, Padova, 2017, 163 s.

[3] On the point M. Basilavecchia, *L'etica dell'amministrazione finanziaria tra responsabilità ed autotutela*, in *Etica Fiscale e Fisco Etico*, in Neotera, n. 2, 2015, 31 s. states: "when it is called to carry out its essential tasks of assessment, the Agency feels in a certain sense authorized to interpret the rules in the way that is most functional to the achievement of its quantitative objectives". On the subject, see also G. Marongiu, *Navigando tra le norme tributarie: alla ricerca di qualche certezza*; G. Gaffuri, *Stato di diritto nel procedimento di accertamento (linee essenziali di una relazione)* both in the *Stato di diritto e Stato sociale nell'attuale esperienza fiscale—Atti del XXXII Congresso nazionale ANTI*, in Neotera, n. 1, 2014, 5 s. and 6 ss.

criterion of higher tax burdens.[4] These *ex post* redevelopments—which denied eligibility for the less onerous tax burdens already enjoyed by the taxpayer and which were often upheld in legal proceedings by a questionable attitude toward tax law[5]—led to unpredictable results of the tax assessment for the taxpayer. Consequently, such redevelopments contributed towards spreading uncertainty about the fiscal consequences of tax planning among economic operators and investors with possible risks to their reputation. This led to the tax legislator's decision to change the rules of the game. With the *ex post* controls, the tax authority would recover higher tax on the basis of mere legal redevelopments of the declared income based on legal guidelines inclined to strengthen the protection of the interest of the State in the collection of tax. On the contrary, in the *ex ante* cooperative dialogue with the taxpayer, the tax authority has the opportunity to fill its information gap through the disclosure of the taxpayer's tax behavior and acquire all the information necessary to better understand the logic underlying the companies' choices, thus overcoming the traditional reluctance toward the evaluative interpretation of controversial tax issues.[6]

[4] Cf. L. Carpentieri, *L'ordinamento tributario tra abuso ed incertezza del diritto*, in Riv. dir. trib., 2008, I, 1053 ss.; F. Gallo, *Brevi considerazioni sulla definizione di abuso del diritto e sul nuovo regime del c.d. adempimento collaborativo*, in Dir. prat. trib., n. 6, 2014, 952 s. On the subject, see also the author's monograph *Dal controllo fiscale sul dichiarato al confronto preventivo sull'imponibile. Dall'accertamento tributario alla compliance*, cit., 92 (note 85 of Chapter 2) and 162 (note 5 of Chapter 4).

[5] The Court of Cassation in the first judgments concerning the abuse of the law (tax Section), 21 October 2005, n. 20398 on dividend washing, 26 October 2005, n. 20816 and 14 November 2005, n. 22932 on dividend stripping officially recognized the taxpayer's unfair conduct, even though no exceptions were made to this effect by the defendant's office. For an in-depth analysis, G. Falsitta, *L'interpretazione antielusiva della norma tributaria come clausola generale immanente al sistema e direttamente ricavabile dai principi costituzionali*, in AA.VV, *Elusione ed abuso del diritto tributario*, Milano, 2009, 19 which stated that the Cassation preferred "to follow the road of circumvention and the detectability of exceptions that benefit finance".

[6] In the past, R. Lupi, *Manuale professionale di diritto tributario*, Milano, 1998, 107 s. already pointed out that officials' circumspection is not so much guided by harassment of the taxpayer, but to the understandable tendency to "cover their backs". This attitude is the result of the spreading in the Offices "of a bureaucratic-formalistic mentality that mortifies the spirit of initiative and tends to avoid responsibility". There is even a risk that the Administration will act as if it were the legislator "certainly not by rewriting the rules, but by reasoning without considering the existing rules"; so that "the casual attitude with which the Offices revert to the 'ability to pay', disregarding the legislative decision-making yields to the impulse to 'punish the crafty ones' even at the cost of destroying the certainty

The aim of the tax legislator is to adopt a new strategy to combat tax evasion and avoidance, with the objective of recovering the centrality of the relations between the tax authority and large companies by consolidating the *ex ante* cooperative dialogue. In this way, the possibility of *contra legem* fiscal behavior during the fulfillment phase will be prevented.

16.2 Transparency and Cooperation in Corporate Governance: Entrusting Tax Compliance to the *Ex ante* Cooperative Dialogues

The cooperative compliance regime is, therefore, aimed at ensuring stability and certainty in relations between tax authorities and taxpayers, enabling large companies, in particular,[7] to manage better the challenges imposed by market globalization and the increasingly widespread practices of aggressive tax planning.[8] Needless to say, stability and certainty

of the rules and often at the cost of considering 'cunning behavior' as completely normal, just because by acting in another way they would have paid higher taxes".

[7] Article 7, paragraph 4, of Legislative Decree n. 128/2015 identifies the subjects who can apply to the new cooperative compliance regime in the large companies, as being those who achieve a volume of business or revenues of not less than ten billion euros and those who had already submitted an application to the Pilot Project on the cooperative compliance regime, and who are equipped with an internal system for the management of tax risk and with a volume of business or revenues of not less than one billion euros. This subjective perimeter is then substantially expanded by the 2016 Measure of the Director of the Revenue Agency which allows entry into the regime, regardless of the volume of business or revenues, to companies wishing to implement the response given by the Revenue Agency during tax ruling on new investments. Regarding the possibility, governed by the 2016 Measure of the Director of the Revenue Agency, to extend the subjective perimeter by "entrainment" of companies that, regardless of the prescribed dimensional requirements, perform functions in relation to the tax risk control system, provided that "this inclusion is necessary for the purpose of a complete representation of the company processes" see also the author's monograph *Dal controllo fiscale sul dichiarato al confronto preventivo sull'imponibile. Dall'accertamento tributario alla compliance*, cit., 172 ss.

[8] In the Italian tax system, legal certainty—understood as the predictability, on the side of the taxpayer, to realize the legal consequences of their actions—has often been undermined by a complex, confusing and cumbersome tax law, characterized by an abundance of laws and a succession of obscure and contradictory provisions. On this subject see A. Berliri, *Sulle cause dell'incertezza nell'individuazione e interpretazione della norma tributaria applicabile ad una determinata fattispecie*, Dir. prat. trib., 1979, I, 3; ID., *Ancora sulle cause della mancanza di certezza nel diritto tributario*, in Giur. imp., 1984, I, 417; E. Della

in the relations between tax authorities and taxpayers, especially if they are large companies, are important factors in tax competition between States, and at least as important as the actual level of taxation. The uncertainty that characterizes both the interpretation of circumstances presenting tax risks and the behaviors that the large company must keep in order to avoid violations of tax laws and constitutional principles is a detrimental condition for investment decisions. Uncertainty produces effects on the medium and long-term credibility and stability of the tax policy and on the competitiveness of our country with significant impacts on economic growth. The preventive certainty, deriving from the possibility of having timely interpretations on the tax treatment to be applied to circumstances of dubious interpretation, is very important for the taxpayer.

With the cooperative compliance regime, the tax legislator aims to achieve two objectives: to guarantee large companies a considerable reduction in the risk of *ex post* assessment, tax disputes and penalizing consequences; to offer the tax authority the opportunity to receive important information on the management of the company from the taxpayer in order to evaluate and, therefore, understand "better" tax operations of dubious interpretation before the taxpayer submits his tax return. The tax authority can also make assessments of non-compliant taxpayers. For this purpose, on the one hand, the tax legislator has induced the taxpayer to adopt an effective fiscal risk control system voluntarily that allows him to acquire certainty on the correct application of the tax law to circumstances that he considers to be a source of risk; on the other hand, he has promoted forms of communication and enhanced cooperation based on mutual trust between the tax authority and the taxpayers in order to favor the prevention and resolution of tax disputes in the common interest of both parties. The 2017 Measure of the Director of the Revenue Agency also moved in this direction, emphasizing the increasingly participatory nature of the relations between tax

Valle, *Affidamento e certezza del diritto tributario*, Milano, 2001, 16 ss.; R. Schiavolin, *Il principio di certezza del diritto e la retroattività delle norme impositrici*, in A. Di Pietro & T. Tassani, *I principi europei nel diritto tributario*, Padova, 2014, 27 s. On the definition of "Legal certainty", see V. M. Corsale, *Certezza del diritto - I) Profili teorici*, in "Enc. Giuridica Treccani", VI, Roma, 1988; L. Gianformaggio, *Certezza del diritto*, in "Digesto disc. priv.", Sez. civ., II, Torino, 1988; S. Praduroux, *Certezza del diritto*, in "Digesto disc. priv.", Sez. civ., Agg. I, Torino, 2014.

authorities and taxpayers. In fact, it has attributed a central role to the preventive discussions in cooperative compliance regime by providing procedural rules governing steady and precautionary dialogues aimed at encouraging communication between the two parties. It is no coincidence that the 2017 Measure of the Director of the Revenue Agency envisaged, for both sides of the tax relations, reciprocal duties of cooperation, correctness and transparency. Such duties are aimed at ensuring, on the one hand, the concrete exercise of the taxpayer's right of defense and, on the other, the interest of the State in the collection of tax.[9]

The preventive discussions are undertaken on the taxpayer's initiative. He is required to communicate in a timely and exhaustive manner (i.e. in time to allow the Tax Office to perform an in-depth examination and, in any case, within the deadline for filing the tax return) those cases susceptible to generating "significant tax risks" (meaning those cases that exceed the quantitative and qualitative materiality thresholds set in agreement with the officials of the CC Office when opening the procedure[10]) and aggressive tax planning operations. On the contrary, the steady and precautionary dialogues may be started on the initiative of the tax office, which examines, jointly with the taxpayer and regardless of the materiality thresholds agreed for the disclosure of significant tax risks, the risky operations from a fiscal point of view, also through the precautionary exercise of the ordinary powers of control.[11]

[9] On the tax interest of the State, see E. De Mita, *Interesse fiscale e tutela del contribuente: le garanzie costituzionali*, Milano, 2006; P. Boria, *L'interesse fiscale*, Torino, 2002, 130; ID., *Sistema tributario*, in "Digesto, disc. priv.", Sec. comm., vol. XIV, Torino, 1997, 29 ss.; ID., *Commento all'art. 53 Cost*, in R. Bifulco, A. Celotto, & M. Olivetti, *Commentario alla Costituzione*, vol. I, Torino, 2006, 1055 ss.; ID., *Il bilanciamento di interesse fiscale e capacità contributiva nell'apprezzamento della Corte Costituzionale*, in L. Perrone & C. Berliri, *Diritto tributario e Corte Costituzionale (i 50 anni della Corte Costituzionale)*, Napoli, 2006, 57 ss.. In this regard, see also L. Antonini, *Dovere tributario, interesse fiscale e diritti costituzionali*, Milano, 1996.

[10] Once the CC regime has been opened, the Office of cooperative compliance assigns to the taxpayer at least two key officials who have the task of encouraging the establishment of an effective and continuous *ex ante* dialogue between the office and the taxpayer. On this subject, see the 2017 Measure of the Director of the Revenue Agency, in point 1.1 letter (r).

[11] See point 4.8 of the 2017 Measure of the Director of the Revenue Agency.

By means of a preliminary comparison with the tax authority, the large companies are able to achieve a "common evaluation" of risk tax operations[12] which will be formalized in the so-called "Cooperative compliance agreement". The content of the agreement binds the parties for the tax period during which the shared solution has been defined and for subsequent tax periods, unless changes occur in the factual or legal circumstances that are relevant for the purposes of the common evaluation.[13]

Under the cooperative compliance regime, the centrality of precautionary dialogues is even confirmed in the 2017 Measure of the Director of the Revenue Agency by the provision of specific procedures aimed at formalizing the positions taken by the tax office at the end of such discussions. In particular, reference is made to the so-called "Reasoned opinions" with which the tax office expresses its position on the notified tax risk: such opinions bind the Revenue Agency and remain valid as long as the factual and legal circumstances on which they are based remain unchanged.[14] By also referring to the so-called "suspended positions"[15] and "postponed

[12] G. Salanitro, *Profili giuridici dell'adempimento collaborativo tra la tutela dell'affidamento ed il risarcimento del danno*, cit., 639 has a critical position on the point. He states that: "there is a 'common evaluation' if together we evaluate a given fact, expressing its judgment. But the judgment is certainly reserved for the tax authority. It would perhaps have been better to speak of a 'common verification' of the factual element, in the sense of verification carried out together, exchanging all the data and information, without prejudice to the assessment carried out by the tax authority. Certainly there is no agreement, either because the legislator does not use this term, or because we are in the cognitive phase where an agreement is not even abstractly conceivable".

[13] See point 5.4 of the 2017 Measure of the Director of Revenue Agency.

[14] Even in the absence of an explicit regulatory provision, it seems logical to believe that the reasoned opinions should be given the same effectiveness as the answers to the tax ruling regulated by article 11 of the Taxpayers' Statute. Unlike tax ruling in the cooperative compliance regime, the tax office can examine in advance, by exercising the ordinary powers of fiscal control, the factual elements constituting the operations characterized by fiscal risks; instead, this control cannot take place in tax ruling where the effectiveness of the response is subordinated to the truthfulness of what was declared by the taxpayer in the request for a reply.

[15] If the taxpayer does not share the positions of the tax office on the tax treatment of the circumstances in question, the positions for which there is no agreement are considered "suspended positions" and will be subject to contradiction even after the presentation of the tax return in order to achieve the desired shared performance of tax duties with a view to reducing tax litigation. If the review should gives a negative result, the suspended positions will instead be subject to tax assessment.

positions",[16] it is evident how much importance has been attributed by the legislator to the preventive comparison. Its introduction confirms that the compliance agreement and, therefore, the establishment of a shared orientation between the parties, is only one of the way of concluding the dialogic relations between the tax authority and the taxpayer. But there is more. To guarantee the effectiveness of the precautionary dialogues between the tax authority and the taxpayer, the 2017 Measure of the Director of the Revenue Agency also introduced the so-called "Closing note of the procedure" with which the taxpayer and the tax authority summarize and acknowledge all the decisions taken during the discussions both on circumstances communicated by the taxpayer and on those investigated by the Office, through the *ex ante* exercise of ordinary powers of control.

In this new context, the tax authority assumes a different role: that of promoting close relations with the large company in order to understand its internal mechanisms and the economic reasons underlying the company's choices as well as to promote the continuous exchange of information for the purpose of solving potentially controversial cases. The tax risk must be dealt with between the tax authority and the taxpayer before the taxpayer fulfills his tax obligations, in the aim of curbing the damaging effects of tax assessments addressed to taxpayers who have declared everything but "badly", at least, in the opinion of the tax authority. Instead, the taxpayer has to work with the tax authority by providing, either voluntarily or upon request, transparent, complete and timely information on circumstances that present greater tax risks and which may give rise to potential differences of interpretation and, as a result, demonstrate behavior oriented toward compliance.

However, the cooperative compliance regime can only achieve the established objectives if the transition from *ex post* control to *ex ante* dialogue is accompanied by a radical change in the culture and in the behavior of both the tax authority and taxpayers. The effects of the CC regime depend, above all, on the mutual trust of the parties involved: trust of the tax authority on the completeness of large companies' disclosure and trust of taxpayers on the correct use of the data notified, which must not be used to trigger, even more than in the past, fiscal controls based on questionable contrasts of interpretation.

[16]These positions refer to those cases that were the subject of precautionary dialogue on which the parties, by mutual agreement, decided to postpone the preliminary dialogue and, therefore, the possible signing of the relative agreement to the subsequent tax period in order to be able to gain, jointly, all the insights necessary to ensure transparency and certainty for the tax relationship.

16.3 Tax Risk Management and Its Strategic Relevance in Corporate Tax Governance Models

Under the reformed tax system, large companies, wanting to fulfill their tax obligations properly, are able to manage the so-called tax risk, defined as the "risk of operating in violation of tax laws or contrary to the principles and purposes of the law",[17] by submitting an application for membership of the cooperative compliance regime. The cooperative dialogue between tax authorities and taxpayers aims, as we have said, to allow the taxpayer to acquire certainty in advance of the correct application of the tax law to circumstances that he considers a source of risk and, therefore, to prevent damages to property and reputation as a result of possible tax assessments.

The tax legislator has established that companies wishing to adhere to the cooperative compliance regime must have an "effective" system in place for detecting, managing and controlling the tax risk.[18] The system is considered "effective" when it is able to assure the company of a constant control over the company processes and consequent tax risks, allowing

[17]As defined in point 1 (d) of the Measure of the Director of the Revenue Agency n. 54237/2016.

[18]See art. 4, paragraph 1, of Legislative Decree n. 128/2015. It should be remembered that the legislator has not provided for a standardized system of fiscal control for companies wishing to adhere to the cooperative compliance regime. The Revenue Agency is, therefore, free to confirm the tendential validity, for the purposes of the new system of cooperative compliance, of the internal control models already implemented in the company as long as they guarantee a strong tax coverage. However, the Measure of the Director of the Revenue Agency n. 54237 of 2016, in point 3.3, has provided the following minimum requirements that this system of internal control of tax risk must possess: (a) a clear and documented tax strategy. The tax strategy is the document, written and signed by the company's top management, aimed at defining the company's objectives in relation to the fiscal variable and reflecting the degree of risk appetite on the part of the company; (b) a clear assignment of roles to persons with appropriate skills and experience, according to criteria for the separation of duties; (c) effective procedures aimed at detecting risk through the mapping of tax risks associated with business processes, to measure risk by determining the entity of tax risks in qualitative or quantitative terms; to manage and control risk through the definition of actions aimed at overseeing tax risks and preventing the occurrence of events; (d) effective monitoring procedures that, through a self-learning cycle, allow the identification of possible errors in the functioning of the system and the consequent activation of corrective actions; (e) adaptability of the enterprise to the main changes affecting the company, including changes to tax legislation; (f) annual report to be sent to the management bodies for examination and consequent evaluations, containing the results of the periodic review and of the checks carried out on the tax obligations, the planned activities, the related results and the measures put in place to remedy any shortcomings that may emerge as a result of monitoring.

the company to best fulfill the duties of transparency and cooperation for which it is responsible.[19] To this end, the tax risk control system must, on the one hand, guarantee the constant involvement of the fiscal variable in business decisions; on the other hand, it must ensure a clear assignment of roles to employees with appropriate skills and experience (the so-called segregation of duties) so that the fiscal variable becomes a strategic element for the company business.

Therefore, in corporate governance, the head of the tax department (the so-called tax director), occupies an executive position within the firm. In order for this person to be able to guarantee respect of the strategic objectives according to the acceptable tax risk that the management intends to take, it is, in fact, necessary for the same to have access to information at all company levels and be involved promptly in government decisions.

In contrast to the mere static and retrospective control, the tax risk management and control system is designed to govern this risk dynamically in order to prevent it, by monitoring procedures that allow deficiencies or errors in the functioning of this system to be identified and, consequently, to activate the necessary corrective actions.[20] In this regard, it should be noted that the Measure of the Director of the Revenue Agency of May 2017[21] not surprisingly includes the sending, at the time of application for admission to the scheme, of the so-called "Map of tax risks"[22] identified by the internal control system from the moment of its implementation and which the taxpayers, in accordance with their duties

[19] See point 3.2 of the Measure of the Director of the Revenue Agency n. 101573 of 2017.

[20] The Revenue Agency has the task of assessing the tax risk control system inspired by criteria of transparency, reasonableness and proportionality both at the time of admission to the cooperative compliance regime and during the permanence of the company under the same scheme; an assessment can, however, end with the proposal of interventions on the tax risk control system in order to stimulate the emergence of the correct measurement of the tax bases.

[21] Measure of the Director of the Revenue Agency, May 26, 2017, n. 101573.

[22] The Measure of the Director of the Revenue Agency, in point 1.1 letter (i), established that the risk map is drawn up for business processes and for each activity involved and highlights, where quantifiable, the economic value of the activities into which the process is divided, the associated tax risks, the relevance of the same for the purposes of achieving the company objectives, as well as the controls set up to protect them.

of cooperation and transparency, must transmit when applying for admission to the regime. Thus, the Revenue Agency has a complete and transparent vision of the management of the company and of the related tax risks.

In other words, the Agency can monitor the company processes as they develop, acquiring knowledge of all the risky circumstances and this occurs regardless of the taxpayer's notification of the cases characterized by significant tax risks during the steady and precautionary dialogues.[23] According to the logic behind the cooperative regime, the Revenue Agency should, therefore, limit its role, so to speak, to "controller" of the "controllers" already provided for within the company. The advantages, for both parties, mainly lie in a prompt, preliminary examination of doubtful cases and in the ensuing reduction of subsequent controls and disputes with a consequent positive impact on the level of taxpayer compliance and on the need for certainty and stability in the relations with the tax authority.

16.4 Positive and Negative Aspects of the Cooperative Compliance Regime

The tax legislator has introduced rewards for taxpayers admitted to the cooperative compliance regime in order to stimulate recourse to this scheme.[24] In addition to the possibility of accomplishing a "common evaluation" of risky tax operations with the "Cooperative Compliance Office" before filing tax returns, taxpayers admitted to the regime can use the so-called "sprint tax ruling" to overcome doubts quickly on the application of tax rules to specific cases for which the possibility of tax risks is recognized.[25] The aim

[23] The Measure of the Director of the Revenue Agency in point 1.1 letter (j), established that by "significant tax risks", reference is made to the tax risks linked to those cases for which the duties of cooperation and transparency set forth in art. 5 of Legislative Decree n. 125/2015 are effective, on the basis of the common assessment of quantitative and qualitative materiality thresholds set between taxpayers and tax authorities in the initial meeting, or in a subsequent meeting.

[24] See art. 6 of Legislative Decree n. 128/2015.

[25] Upon receipt of the request by the taxpayer, the Revenue Agency, within fifteen days, assesses the suitability of the application and the sufficiency of the documentation produced and responds to the request within forty-five days. Subsequently, the taxpayer must inform the Agency of the behavior actually adopted if it differs from what is represented in the opinion issued by the tax authority.

of this special measure is, in particular, to strengthen the privileged relations that the tax authority intends to establish with taxpayers admitted to the regime. With regard to tax risks that the taxpayer has communicated in a timely and exhaustive manner to the Revenue Agency before filing tax returns, if the Agency does not agree with the company's position, the administrative sanctions applicable are reduced by half and, in any case, they cannot be above the minimum edict. Moreover, their collection is suspended until the finalization of the assessment. In the event of a tax offense, the Revenue Agency is required to inform the Prosecutor of the italian Republic if the taxpayer has joined the scheme, providing any useful information regarding the tax risk control system adopted by the taxpayer.[26] Finally, taxpayers who access the cooperative compliance regime are not required to provide guarantees for the payment of tax debts.

However, it remains to be seen whether the critical issues characterizing the discipline of the cooperative compliance regime slow down the scheme's development. To this end, there are two critical issues that need to be highlighted.

The first critical issue is that there are no rules for preventing the repetition of controls on cases characterized by tax risks and covered by the management and control system of the company but which have not been subject to steady and precautionary dialogues. The reason for this is that such cases are unlikely to include the conditions of "significant tax risks" for which there is, instead, the obligation of a timely and exhaustive representation to the Office. The 2017 Measure of the Director of the Revenue Agency has established that, limited to the cases in question, including the "suspended" positions and the "postponed" positions, the Revenue Agency will not repeat the controls already carried out during the steady and precautionary dialogues. The *ex post* control can be carried out only in two cases: the first case is when there are changes in the factual or legal circumstances relevant to the assessment performed or when the aforementioned circumstances represented by the company are untrue or incomplete; the second case is when the correct application of the answers given is verified. Therefore, the exhaustion of the *ex post* powers of control, due to the carrying out of earlier

[26] All those who join the scheme are included in the special list published on the Revenue Agency's institutional website.

controls, is limited only to those cases that have been the subject of steady and precautionary dialogues.[27]

However, it is necessary to ask whether the limitation of the Office's powers of control also concerns those cases that have not been the subject of precautionary dialogues because they are unlikely to include significant tax risks, but are, however, considered to have been notified because they are included in the map of tax risks associated with the business processes. The answer should be positive because if the tax risk control system is implemented correctly, the Revenue Agency must trust in it. In fact, for these cases, the internal control system itself guarantees the effective nature of the management of the tax risk and, therefore, enables the Office to exercise an *ex ante* control on the disputed cases. If this were not the case, the companies joining the scheme would risk undergoing *ex post* controls even if they have a correctly implemented internal tax risk control system; such a system allows the Cooperative Compliance Office the possibility to identify, as a preventive measure, the cases that could generate tax risks even if they are not promptly disclosed by the taxpayer.

The power of control recognized *ex ante* should lead to the exhaustion of the *ex post* control of both the CC Office and the competent territorial structures. This would prevent companies admitted to the scheme and voluntarily submitted to the *ex ante* power of control of the Office from being subject to further *ex post* verification and assessment except for the verification of the effective and correct application of the interpretative solutions rendered by the Office in the context of steady and precautionary dialogues.

The second critical matter is that risks and criminal liability should be excluded for companies admitted to the cooperative compliance regime where the Agency's interpretations of the circumstances communicated *ex ante* diverge from those of the taxpayer. This would seem to be a more than natural effect of admission to the regime, given the

[27] This category includes: cases that may generate significant tax risks (for which, on the basis of a common assessment between the taxpayer and the Office of the quantitative and qualitative materiality thresholds, the duties of transparency and cooperation governed by the Measure are considered operative); aggressive tax planning operations; the cases that do not fall within the aforementioned thresholds (and are, therefore, excluded from the notification obligation), but that the taxpayer autonomously decides to communicate during the preventive discussions with the Office because it considers them uncertain, controversial and, in any case, a source of potentially significant tax risk.

transparent behavior of the company, if and to the extent that it fulfills its duties of communication; instead, it represents a controversial topic. The characteristics of the cooperative compliance regime should not lead to the emergence of liability to penal sanctioning with respect to complying companies which have promptly communicated tax risks. Furthermore, should the quantitative thresholds of criminal relevance be exceeded, there should be no consequence as far as the forwarding of *notitia criminis* is concerned. On the contrary, the reporting of a criminal offence would make sense if the taxpayer had intentionally failed to adhere to the compliance obligations by adopting such omissive behavior as to cause, in addition to the immediate and automatic exclusion from the scheme and the possible termination *ex tunc* of the related effects, the forwarding of the *notitia criminis* to the competent authorities. Therefore, if the company remains in the scheme, it is difficult to understand the reasons behind the provision contained in paragraph 4 of art. 6 of Legislative Decree n. 128/2015 according to which the Revenue Agency must send a "communication" to the Public Prosecutor's office giving notice that the taxpayer has joined the cooperative compliance regime.

In conclusion, although the cooperative compliance regime represents a Copernican revolution in the relations between tax authorities and large companies, this scheme is currently considered a sort of "laboratory" of compliance in which the new relational model has to tackle and overcome some critical issues that could hinder its diffusion.

CHAPTER 17

Assessing Tax Risk by "Country-by-Country Reporting"

José A. Rozas, Maria Pia Nastri and Enza Sonetti

17.1 Introduction

By Dr. Enza Sonetti

Recently, the greater awareness of the complexity of multinational enterprise (MNE) groups' tax arrangements has pushed the Organisation for Economic Co-operation and Development (OECD) and European Union to adopt measures for preventing base erosion and profit shifting carried out by multinationals. The attention to the way they allocate their profits has been growing in the last few decades due to the conflict between tax authorities and MNE groups in applying transfer pricing principles, as tax authorities try to ensure revenue collection, while corporations seek to reduce their tax burdens, often by exploiting loopholes in legislation or adopting a formal but not substantial meaning of the

J. A. Rozas (✉) · E. Sonetti
Faculty of Law, University of Barcelona, Barcelona, Spain
e-mail: jarozas@ub.edu

M. P. Nastri · E. Sonetti
Faculty of Law, University Suor Orsola Benincasa, Naples, Italy
e-mail: mariapia.nastri@unisob.na.it

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rules. In addition, the OECD's Action 13 and European Union's activity have been directed towards improving the tax risk assessment abilities of tax authorities to limit the adoption of aggressive tax planning strategies aiming to transfer profits to low-tax jurisdictions. The development of these activities has been articulated via the approval of anti-abuse rules[1] or alternative dispute resolution in transfer pricing matters and the increase of tax transparency duties. With reference to the latter, they have been enhanced in recent years to achieve cooperation between the tax administration and taxpayers, with the twin objectives of avoiding tax evasion and encouraging the development of a fair, certain and efficient tax system. In this sense, reversing the natural trend to keep accountancy information secret, the OECD and European Union have called for disclosure rules to provide country-by-country (CbC) tax information of MNE groups, and many countries, including Italy and Spain, have adapted their legislation, aiming to ensure that corporations pay the fair amount of taxes in each country in which they operate.[2]

17.2 Tax Transparency to Fight Tax Avoidance: CbCR in OECD and European Law's Experience

By Dr. Enza Sonetti

MNEs groups' transfer pricing strategies to move their profits to countries with low tax rates constitute one of the most debated political issues at the OECD and European levels. This practice affects the proper functioning and competitiveness of markets: To successfully work, the markets require corporations to pay taxes where they generate profits and create value. Tax compliance has become a fundamental issue in corporate social responsibility policies, moving companies to find new ways of achieving tax savings without incurring tax liability-related risks. In this context, profit shifting perhaps represents one of the most challenging tasks for tax authorities; it has consequences not only for national revenues but also for the same MNE groups in terms of reputational risks if their evasion becomes public knowledge.[3]

It has been argued that profit shifting and tax avoidance increase due to a lack of transparency in financial reporting.[4] As a response, tax transparency duties have increased significantly in recent years. The obligations to disclose tax-relevant information have been multiplied to address

tax avoidance strategies and enhance cooperation between taxpayers and tax administrations. The request for more transparency in financial reporting has led to the adoption of CbC reporting (CbCR) as part of transfer pricing documentation. CbCR aims to disclose MNE groups' tax data, referring to the profits and taxes paid in each country where MNEs operate and provide tax administrations with adequate information to assess high-level transfer pricing-related risks. For this reason, since 2015, the OECD[5] and European Commission[6] have adopted measures to require multinational groups with a total consolidated group revenue of €750 million to report key information about profits made or taxes paid to tax administrations, with the aim of facilitating risk assessments in transfer pricing matters.[7]

First, it must be pointed out that CbCR was adopted by the OECD in the BEPS Action 13 minimum standard, which states that the ultimate parent entity (UPE) of an MNE group should file a CbCR with the tax authority in the country of residence, usually up to 12 months after the end of the fiscal reporting period. The template should indicate incomes, taxes paid or other indicators of economic activity,[8] with reference to each country where the group develops its businesses. In this way, tax authorities will be able to understand the allocation of incomes carried out by MNEs and better organise tax audits in transfer pricing matters.[9] The first report had to be completed with reference to the fiscal year commencing on or after 1 January 2016, and its consequent automatic exchange had to be realised before June 2018. The CbCR template was included in the automatic exchange between tax authorities following the Multilateral Convention on Administrative Assistance in Tax Matters, bilateral tax conventions or Tax Information Exchange Agreements (TIEAs). To date, 72 jurisdictions have signed the CbC multilateral competent authority agreement, and all 28 Member States of the European Union are included in the exchange provided by Council Directive 2016/881/EU (DAC 4).[10] According to the OECD's Action 13, MNEs can also nominate a surrogate parent entity (SPE) and file CbCR on a voluntary basis.[11]

CbCR does not constitute a novel step for some productive sectors and countries: before the provisions contained in Action 13, extractive and financial sectors already provided for this obligation, but the aim of this was simply preventing corruption. In the same way, the EU Accounting and Transparency Directive (Dir. 2013/34/EU[12]) asked for disclosure of payments to national governments made by extractive and

forestry corporations.[13] As mentioned above, in line with OECD Action 13, the European Commission has asked for CbCR for multinationals, with the same revenue threshold provided for therein, and in 2016, it amended EU Council Directive 2011/16 concerning the mandatory automatic exchange of information in the taxation field. Nevertheless, in contrast to the OECD, the European strategy for disclosing tax information seems to go a different direction, as a proposal amending the existing Accounting Directive, made in 2016, asks for public disclosure of the reports of MNEs carrying out activities in the European Union, in view of positive effects in fighting against tax avoidance and increasing corporate social responsibility.[14] It is not necessary to underline the critical stances that the proposal, already approved by the European Parliament in 2017, has received,[15] as this would require a different treatment specific to the multinationals operating in the European Union, which would be distinct from what was decided in the OECD context. Moreover, as argued by some authors, mandatory public CbCR would give rise to competitive disadvantages, in addition to violating tax secrecy, which represents a building block for many countries[16]; another issue is that it would contravene the OECD recommendation asking for confidentiality.

CbCR has been considered an instrument that can enhance tax authorities' knowledge of tax risk, making them better able to prevent it. Especially, being included in transfer pricing documentation (besides Master file and Local file, which identify data on transfer pricing policies and intercompany transactions, respectively) will help tax authorities work to MNE groups' overarching strategies and businesses. It could also help them to better understand the reasons inspiring MNEs' tax decisions, as well as improving corporations' tax responses. It can indeed have a positive influence on corporate tax behaviour, as increasing transparency about MNEs' tax issues will enhance the attention to and concern over reputational risks deriving from publicly available assessments. Indeed, transparency is strictly linked to fairness and compliance[17]; in this sense, making public information available can have positive effects on taxpayers, improving their propensity to fulfil their tax obligations due to a deterrence effect intertwined with tax disclosure duties.[18]

From another point of view, although CbCR is an essential tool for preventing tax risk, it presents some disconnect with transfer pricing policies. Transfer pricing's rules work on an arm's length principle, while CbCR data are related to where economic activities are carried

out, even if they must be used in connection to Master and Local File. Thus, although tax authorities should not use CbCR as evidence in tax assessment, it is obvious that clues could derive from it, and these could give rise to investigations with false-positive results in identifying income shifting. Moreover, it is not clear why the OECD, in listing the elements to indicate in the template, forgives intangible assets or debt, intercompany interests and payments. Furthermore, it uses an aggregate reporting method per jurisdiction and not a consolidated one,[19] except if the UPE's jurisdiction has a system of taxation for corporate groups that includes consolidated reporting for tax purposes; in this case, if the consolidation eliminates intragroup transactions, MNE groups should be allowed to use this reporting method.[20] Indeed, at an aggregated level, the report multiplies the possibility of double counting that, for example, may derive from a stateless income, as it will be reported in its dedicated row and in the one where each owner reports its share according to its residence.[21]

17.3 Transfer Prices Documentation and Country-by-Country Reporting for Multinational Companies in Italy

By Prof. M. P. Nastri

In the framework of a profound international renewal in all states and with the declared intent to guarantee, through greater fiscal transparency, a more effective fight against international evasion, Italy has made a commitment to improve its fiscal transparency standards to meet those set by the OECD.

In fact, numerous initiatives have been promoted not only at the OECD level, but also by international organisations aimed at combating the problems deriving from evasion through international circumvention, but also in relation to the recovery of the eroded tax base, through administrative cooperation.

Italy's commitment to transparency and information exchange is not only limited to on-demand and spontaneous exchange, but also includes the automatic exchange of information and the implementation of base erosion and profit sharing (BEPS) results on transparency (exchange of information on tax rulings and country-by-country reports) and the improvement of the availability of and access to information on the

ownership and actual beneficiaries of both legal entities and assets, in cash, securities or real estate.

It is evident that the relationships between multinational groups of companies and the tax administrations of the main countries are rapidly changing: the application practice and the transfer pricing policies adopted by the large groups must take into account new application scenarios and, naturally, Italy must also adapt to these changes.[22]

In fact, the 2016 Budget Law introduced the duty for parent companies, residing in Italy of multinational groups, to fulfil each year the so-called Country-by-Country Reporting (CbCR).

The adoption of the CbCR introduces the mandatory global disclosure for a company, a highly innovative document at the international level, made available to the authorities of the countries in which the group operates. This report extends the action of the individual tax administrations, which until now has been limited to the usual control instruments. The fundamental novelty of the new report with respect to the previous document's requirements is that it is a mandatory and simple template (a pre-established standard is envisaged) that allows for the automatic exchange between tax administrations at an international level.

The CbCR shows the amount of revenues and gross profits, taxes paid and additional indicators of effective economic activity. The CbCR, together with other information and documents formulated at the group or national level, completes the so-called information framework on investment policies, transfer pricing and distribution of tax bases adopted by a multinational group. This information allows the execution, by the financial administrations, of a coherent and coordinated analysis and control activity, and the possible prevention of tax avoidance, which may constitute an obstacle to the development of trade. The CbCR has been applied in Italy by the Regulation of the Director of the Revenue Agency of 28 November 2017, which contains rules for groups of multinational companies, providing the contents and the methods of management and transmission of the information requested according to the provisions of the ministerial decree of February 2017.[23]

The international context in which the CbCR is inserted and the adhesion of many countries presents difficulties of application from the normative and regulatory points of view. In fact, the OECD Directives and Community legislation are explicitly referred to only regarding the motivations, for which the decree specifies that the provisions on the correct use and proceedings of data are outlined in accordance with the

OECD guidelines and in compliance with the Multilateral Agreement on Mutual Administrative Assistance in Tax Matters.

Italy has adjusted the national legislation to the OECD and EU guidelines, introducing documentary duties for companies in the field of transfer pricing. The expected documentation is constituted by the so-called master file containing information on the group's global business and transfer pricing policies. Moreover, the documentation includes a local file describing in detail the intercompany transactions of each country in which the group operates and the CbCR, which annually reports basic information, such as the amount of revenues, income realised, taxes set aside and those paid, in addition to invested capital, the number of employees, the tangible assets of each unit of the group operating in the various countries.

In the preparation of the local file, the intragroup transactions have to be highlighted, with reference to the comparability analysis that represents the main aspect of the transfer pricing system, as well as to the description of the 'method' used to determine the transfer pricing. The national documents must, therefore, recall the results of the comparability analysis, which determined the classification of the method adopted, as more specifically reported. The taxpayer will, therefore, have to provide three documentary levels in order to produce detailed information on the positions taken on transfer pricing, allowing tax administrations to verify the risk profile and plan the control and assessment activities. In this way, the tax administrations of individual countries will be able to evaluate any operation carried out by groups of companies to counteract tax avoidance resulting from profit shifting to countries with much more advantageous tax regimes.

Moreover, the need to acquire information from the administrations has to be balanced with the containment of the costs and charges of the company documentation, protecting taxpayers with regard to the use, by the tax authorities, of the information acquired.[24] With the new report, the tax administration of the different countries will be able to use the information to carry out control and assessment activities. This report contributes to the realisation of the 'fiscal transparency', but will not, alone, be sufficient to make a correction in transfer pricing issues and therefore of the assessment of a higher taxable amount.

The proper production of the documentation constitutes an exemption from the possible application of administrative penalties in case of assessment of a higher taxable income. The introduction of penalty

protection for those who opt for this regime has been a particular innovation in our legal system. However, recent jurisprudence has shown differences in the assessment of the 'suitability' of the documentation provided by the taxpayer.[25] Recent changes introduced in our transfer pricing rules fit into this general legal framework.[26]

The formal communication to the revenue agency stating the possession of the documentation is of particular importance as it constitutes a precise willingness to implement an effective collaboration between the taxpayer and the revenue agency by preparing the documents necessary to facilitate the control activities of the financial administration in checking the compliance of intercompany prices according to the arm's length principle.

From another point of view and in order to adapt national legislation on transfer pricing on OECD recommendations, the decree of 24 April 2017, n. 50 has introduced numerous innovations, both from a substantial and procedural point of view. The substantial changes concern the modification of paragraph 7, art. 110 of the T.U.I.R., while with regard to the procedural profile the legislator has integrated art. 31, paragraph 1, of the D.P.R. n. 600/1973.

In particular, art. 24 of the aforementioned decree amended paragraph 7 of art. 110 of the T.U.I.R. replacing the reference to normal value, pursuant to art. 9 of the same T.U.I.R., as a comparison to establish the adequacy of transfer prices, with direct reference to the conditions and prices that would have been agreed between independent parties operating in conditions of free competition and in comparable circumstances (arm's length principle) on which the guidelines published by the OECD are founded. Furthermore, paragraph 7 states that 'By decree of the Minister of Economy and Finance, the guidelines for the application of this paragraph may be determined on the basis of best international practices'. The reformulation of art. 110, paragraph 7 arises from the need to align the terminology of the internal rules on transfer pricing with the most recent indications that have emerged from the OECD, also in the context of the work of the project BEPS.

So, in the current regulatory system, the implicit reference to the OECD directives is clear: the reference to 'normal value' has been replaced with that of the arm's length principle (the so-called free competition principle), referred to Article 9 of the OECD Model Tax Convention. At the same time, the decree eliminates the last period of the same seventh paragraph, i.e. the one that extended the recourse to

the normal value for the sale and placing on the market of raw materials or goods and the manufacture and proceeding of products carried out by resident companies on behalf of non-resident companies. However, this is a reference that has been introduced into our legal system (even if by ministerial decree) to the aforementioned directives.[27]

The secondary legislation was implemented by a provision (protocol No. 108954 published on 30 May 2018), which completes the reform proceedings initiated by art. 59 of Decree n. 50/2017 resolving the problem of double taxation in case of foreign adjustment of transfer prices by implementing art. 31-quater of the D.P.R. n. 600/1973. The final version of the provision arises from the comparison between the financial administration and operators in the context of a public consultation proceeding: The revenue agency, in order to identify and pursue these guidelines, has activated a consultation proceeding with the main stakeholders (from 21 February to 21 March 2018), which then allowed the issue on 14 May 2018 of the decree containing the so-called guidelines for the application of the provisions of art. 110, paragraph 7.

In order to avoid double taxation, it is necessary that in view of the contestation—by a given state—of a higher taxable amount depending on the reconciliation at arm's length of the intragroup transfer prices (primary adjustment), a consistent adjustment should be recognised of equal amount, but of opposite sign, of the taxable income in the different residence country of the counterpart subject of the ascertained transaction (corresponding adjustment).

The recent amendment introduces an innovative element into our legal system, extending the hypothesis of recognition of decreases in income and allowing the alignment of internal provisions with those of other foreign jurisdictions.[28]

The introduction of art. 110, paragraph 7 is in regard to the possible changes to the taxable income of taxpayers in cases in which, by a corresponding verification carried out on the counterparty of the transaction, a lower taxable amount emerges than the declared one and bridges a regulatory vacuum of our legal system. This lacuna derives from its failure to transpose, in the double taxation treaties signed by Italy, paragraph 2 of art. 9 of the OECD model; in the absence of such a regulatory provision, the adjustments to reduce the taxable income of taxpayers are possible only in execution of a special friendly procedure carried out according to the procedures indicated in art. 25 of the OECD model. The recent art. 31-quater D.P.R. n. 600/1973, in order to prevent double taxation,

allows the taxpayer to ask for a corresponding adjustment if the other country's tax administration assesses a higher taxable amount (primary adjustment). In this manner, it is no longer mandatory to rely on a procedure of mutual agreement to obtain an income-decreasing adjustment.

With regard to the condition of definitiveness of the increased adjustment made in the foreign state, it is necessary to clarify whether the aforementioned requirement is to be considered as defining the so-called 'unrepeatable' taxes (as per Circular n. 9/2015); in consideration of the applicative difficulties in the absence of definitiveness, it has to be clarified that art. 31-quater (lett. c), of the D.P.R. n. 600/1973 explicitly provided for the possibility to present the application in relation to adjustments that have not yet become definitive. The proceeding will, of course, be destined to remain suspended until the subsequent definitive action of the foreign tax deed, therefore the corresponding adjustment will be subject to the prior acquisition of a certification issued by the foreign tax authority or to other documentation certifying the finality of the increased adjustment.

Even with regard to the requirement of compliance with the principle of free competition, there are perplexities in the application: for example, it is necessary to ask whether the requirement is respected even if the taxpayer can demonstrate that the criteria adopted abroad lead to results in line with those that would have been implemented through the OECD guidelines.

Although characterised by some grey areas, the new instrument provides the taxpayer with a further and preventive method of reducing the tax base without necessarily having to activate the procedure for the preventive resolution of disputes.

The procedure, narrow in its application, will conclude with the issuing of a motivated document of the office of recognition or non-recognition of the decrease in income without jeopardising, in case of refusal, the terms for the activation of the legal instrument for the resolution of international disputes indicated in the application.[29]

The new procedure appears favourable for taxpayers as the clauses that provide for the possibility of starting 'friendly procedures' between the administrations involved and normally provided for in bilateral double taxation treaties, do not in any way obligate the administrations to find a solution to it in the specific case.[30]

The introduction of an additional tool for obtaining the corresponding adjustment as an alternative to MAP (without precluding its use) thus expands the protection against international double taxation,

representing an important innovation for the financial administration to deflate the friendly procedures currently used mainly for transfer pricing adjustments within multinational groups. In this way, a reduction in the investigation time and the overall number of friendly procedures should be achieved with a consequent improvement in the efficiency of the administrative activity. The benefits will also be tangible for the taxpayer who will be able to take advantage of a new preventive means of resolving disputes to be activated through a dialectic relationship with the financial administration, avoiding the lengths of friendly procedures, often between unsuccessful ones. With the publication of the provision of 30 May 2018, implementing new measures on the corresponding adjustment, an important course of evolution of the domestic discipline regarding intragroup transfer prices is completed. The Italian discipline is actually among the most updated, on the international scene. In fact, the widening of the available instruments, beyond the amicable procedures, will produce specific effects in the fight against international double taxation as a consequence of intragroup transfer pricing adjustments.

Therefore, the introduced changes fall within the scope of the aforementioned CbCR, in order to integrate and complete the documentation that multinational groups must prepare in relation to intragroup prices, thus facilitating the understanding by the individual authorities of the transfer pricing policies adopted by taxpayers, encouraging cooperation between the administrations of the various countries involved in transactions with a higher tax risk profile. Alongside the profile of corporate tax transparency, the ethical values that inspire entrepreneurial strategy and that are perceived by the market as essential elements of corporate social responsibility are also essential. Probably these aspects also contributed to motivate the proposal to publish information on taxes paid and on the location of profits by multinational groups, currently under discussion in the European Union.

Along with these new documental and informative obligations, cooperative compliance tools are being developed and disseminated, the fundamental elements of which are transparency and the willingness to make available to the financial administration relevant information on the commercial aspects that determine the transactions and direct the activities of the large taxpayers and a correct approach in relation to risk management by taxpayers. The current increasingly globalised economic context leads to a reflection on the need to achieve multilateral cooperative compliance in a broader cross-border transparency framework.

17.4 Comparing the Spanish Approach to CbCR with OECD, EU Law and Other Countries

By Prof. J. A. Rozas.

On July 2015, Spain was probably the first country[31] receiving on its Corporation tax rules the BEPS Action 13, even before than Australia, Canada, USA, UK, France, Denmark, the Netherlands or Germany.[32] It was done by modifying the rules on transfer pricing documentation (master file and local file) in three senses: (1) simplifying the standard documentation for those enterprises with an extremely low—for this purpose—turnover under 45 M €[33]; (2) increasing the standard documentation for all the MNEs[34]; and (3) establishing a new obligation, to present a CbCR, for those MNEs with a turnover higher than 750 M €.[35]

From 2016 all the MNEs resident in Spain, with a turnover higher than 750 M €,[36] must fulfil a CbCR, according to the digital Form 231,[37] up to twelve months after the end of the fiscal reporting period. In most other countries the first mandatory fiscal year to file CbCR has been 2017, and even, as in Switzerland or Hungary,[38] 2018. The CbC reports received by the Spanish tax authorities are sharing with the other 125 jurisdictions currently participate in the Multilateral Convention on Mutual Administrative Assistance in Tax Matters, developed by the OECD and the Council of Europe (1988/2010).[39]

Following the OECD recommendations, the reporting obligation would not cover only those companies, but also certain Spanish subsidiaries or PEs owned or controlled by a partner corporation resident in a country where CbCR does not exist, there is no an exchange information agreement with Spain, or the agreement, in practice, presents 'systemic failure'. This reporting obligation, without exemptions, seems to be disproportionate for these so-called 'surrogates partner companies', especially in three cases: (1) if they do not have significant activity in Spain; (2) when they do not have access to the data of the ultimate parent company; and (3) when it implies multiply the reporting obligation in several countries.[40]

The Spanish regulation is previous to the Council Directive 2016/881/EU (DAC 4) but covers, better or worse, all its requirements. Therefore, the European Law states a tie-breaker rule that the Spanish regulation does not consider and that it would be applied for those PE or companies without residence in Spain eligible for CbCR,

'surrogate parent entities': if the partner company has presented this documentation in another EU country, it would be not required in Spain. At this purpose, the Spanish regulation would be modified, according to the rules of the Directive, and it would be considered disproportionate.[41] In practice, there will not be CbCR obligation for a Spanish constituent company if its ultimate partner would be fiscal resident in an EU State member, but it would be said formally.[42]

In one sense, the Spanish Government has added some information of the CbCR to the transfer pricing documentation, master and local file.[43] In fact, this policy implies a higher burden of producing and reporting transfer pricing documentation for all the MNEs, not only for those obliged to CbCR. This new reporting information could it be disproportionate, according to the OECD standards. Otherwise, Spanish legislation states heavy penalties for those companies that do not produce, keep, or report all this documentation.

Regarding the specific CbCR for MNEs over 750 M €, according to the Form 231, Spain has limited the structured and volume of the information at the minimum standard required by the OECD template but it is consistent with the requirements of Action 13 BEPS. Regarding confidentiality, it will not be possible to use the information for other purposes than the administration of taxes and, nowadays, has not considered making public the information. Therefore, a public report of income tax information (RTI)—quite similar to the CbCR—is already mandatory in European Union, either for banking sector or for extractive and logging industry. Moreover, the European Commission has presented a proposal of Directive, amending Directive 2013/34/EU, to extend publicity to all the MNEs reporting CbC.[44]

The information required by the Spanish government is consistent with the CbCR described by the European Law,[45] and reflects, exactly in Spanish, the very simple template—two sheets with three boxes—included on Action 13 BEPS.[46] It is required a general overview of constituent entity information: (1) amount of revenues (ordinary or extraordinary, and distinguishing between those revenues generated from constituent entities and those not generated from constituent entities), (2) profit (loss) before income tax, (3) income tax, or equivalent, paid, (4) income tax, or equivalent, accrued, (5) stated capital, (6) accumulated earnings, (7) number of employees, (8) tangible assets, other than cash or cash equivalents. It is also compulsory to identify[47] all the constituent entities of the MNE Group setting out their jurisdiction of tax

residence and the jurisdiction under the laws of which each constituent entity is organised, and the nature of the main business activity or activities of each one: holding, central services, R&D, holding intellectual property, purchasing or procurement, sales, marketing or distribution, manufacturing or production, services to associated enterprises, insurances, financial services intragroup, financial activities, dormant, others (including description). Finally, there is an open box within the OECD template—the same one, also, in the Spanish version—where the taxpayers voluntary can—if they wish to do it—briefly to add whatever information they consider necessary or that would facilitate understanding of the compulsory information.

One of the challenges of this new field for the exchange of information between Tax Administrations and MNEs is the effective translation of the rules. It was not clear, indeed, when the process began on 2015, the meaning of many terms—as 'group', 'consolidate revenues', 'related-party', 'employees' or 'income taxes'—used by the CbCR rules. Certainly, nowadays, the OECD has published a Guide for clarifying the way to understand and apply CbCR[48]—as an addition to the Guidelines on transfer pricing—with three parts: (1) the scope of CbC reporting; (2) the information to be included in the CbC reporting tables; and (3) the (exchange) mechanism for CbC reporting.[49]

The OECD criteria set a framework of flexibility to limit MNEs tax compliance costs, affording them to use the information that they already produce for different scopes (bottom-up). But, at the same time, if the objective is to share standard information between several Tax Administrations, the structure and content of the reporting must be equivalent in all the countries (top-down). Not enough information could be as useless as too many information,[50] be aware to the so-called principle of commensurability, presents within the OECD recommendations: "The taxpayer should not be urged to take an economically unjustifiable effort when preparing its transfer pricing documentation".[51] To choose the sources from recording data, and IT requirements for consolidating all the information, and going ahead with the process, it is neither easy nor cheap.

A good practice in this direction is the International Assurance Compliance Program[52] launched by the OECD on January 2018, with eight Tax Administrations and eight MNEs—one resident in each country—just for working together in producing and exchanging the right, enough and proportionate documentation for tax purposes. Spain

and Italy are participating in this project: *Repsol*, an extractive oil corporation, is the Spanish MNE working on it, and *Unicredit*, a financial company, the Italian one. This methodology represents the right way to advance in the field: following a cost-minimisation compliance strategy, for obtaining just enough and proper information in the most simple and economical way.[53] Neither bottom-up nor top-down, but shoulder to shoulder.[54] Working together—Tax Administrations and MNEs—to improve the present OECD template in order to become as simple, enough, and useful as possible.

In this vein, the CbCR must not be understood by the Tax Administrations, at least mainly, like a source—a managerial tool—of information for beginning an audit in order to finish it with a retrospective adjustment of the tax debt, but as an opportunity for increasing its commercial awareness and transfer pricing risk assessment.[55] So, the objective of obtaining data is not to use them directly within a specific audit procedure, but for planning the tax administrations activity from a tax risk management perspective. On the other hand, for large businesses CbCR could it be the way of building a trusted relationship with tax authorities and to prevent and avoid aggressive tax planning, financial risks, and reputational costs. In the future, maybe, it would be also the needed information for changing the MNEs taxation system, from a transfer pricing model through an apportionment formula one. The BEPS nuclear assumption is that MNEs are shifting their profits to law taxes jurisdictions where, in fact, there is no relevant and significant nexus between those profits and a real business activity. The main purpose of BEPS is to approach taxation on profits to those jurisdictions where has been generated value. So, it is necessary to check this assumption with consistent financial data of the MNEs: this is the purpose, and the nuclear role, of CbCR.[56]

17.5 Conclusion

By Prof. J. Rozas—Prof. M. P. Nastri—Dr. E. Sonetti

In recent years, the OECD and European Union have progressively increased transparency and disclosure duties to better assess tax risks and prevent tax avoidance. As part of transfer pricing documentation, CbCR completes the data for controlling and preventing tax risk in transfer pricing matters. The first two are the master and local file mentioned above.

As underlined in this paper, many countries, including Italy and Spain, have modified their legislation to adapt it to OECD recommendations and European Union legislation, ensure tax risk assessment in transfer pricing matters by CbCR and avoid profit shifting. Especially, Italy has adapted its legislation in transfer pricing, substituting the normal value principle with the arm's length principle and providing for documentation requirements that will allow the Revenue Agency to better assess tax risk in transfer pricing issues. Concerning these issues, the entry into force of the so-called penalty protection, which will exempt taxpayers that comply with the new formal requirements from penalties, is noteworthy; this is part of new alternative dispute resolutions method that will facilitate the settlement of conflicts in transfer pricing matters. This choice reflects and follows the steps taken by Italian legislators to improve and enhance tax cooperative compliance strategies in the last decade.

On the other hand, Spanish experience shows all the consequences of autonomous strategies: the lack of coordination between OECD proposals, EU legislation and national policies has as result in some aspects, the request of a standard of transfer pricing documentation and CbCR higher than the one that is really proposed by the international organisation or established by the Directive (EU) 2016/881. This choice is in contrast with OECD recommendations that aim to give more flexibility to not increase MNEs compliance costs if not necessary. Nevertheless, it is noteworthy the involvement of Spain, as Italy too, in International Assurance Compliance Program that could really change the way large taxpayers cooperate with tax administrations in this field.

It is still early to examine tangible CbCR results, in terms of their effectiveness for tax risk assessment and profit shifting prevention. From MNEs' point of view, it should be considered that CbCR will, rightly or wrongly, reduce tax planning freedom, as corporations will need to adapt their strategies to this new transparent relationship, in which tax authorities can pass all their operations and activities under the magnifying glass. What is more, it is expected to result in elevated compliance costs, not only in the initial phases but also in the following ones, as accounting rules change over time and can increase the possibility of conflict between countries trying to attract taxable income to their jurisdiction.

However, it is clear that the reports could have significant consequences for the allocation of taxing rights, and consequently, tax planning strategies, as their structure is based on where economic activities are really located. In this sense, the reports could contribute

to integrating or (maybe?) substituting the arm's-length principle for tax assessments with different criteria based on destination or source principles.

The difficulties connected to its fulfilment and the risk related to data misinterpretation by tax administrations, derived from excessive or partial information, may give rise to controversies not only between countries where incomes are taxable but also between taxpayers and tax administrations. Moreover, the different and autonomous directions that the OECD and European Union seem to have taken on report confidentiality may open a complex scenario in which reports of MNEs operating in the European Union could be public knowledge, with all the associated consequences for matters of privacy and convenience. In this sense, there are some questions arising that cannot be answered in this context, as follows: Is it really necessary, in terms of preventing tax risks, to boundlessly expand corporations' accounting data? Is it fair to use social disapproval as a special penalty to enhance tax avoidance fighting? It is clear that mandatory public disclosure—for MNEs operating in European territory as a disincentive to investments on the 'old continent'.

Transparency has seemingly come to stay and revolutionise tax authorities' strategies in assessing and reducing tax risk to prevent tax avoidance. However, it is clear that these new strategies need to be coordinated so that they do not create unequal market conditions that could address investments.

Notes

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7. OECD. (2017). *Country-by-country reporting: Handbook on effective tax risk assessment*. Paris, France.
8. Related and unrelated party revenues, pre-tax profits (loss), cash income tax paid, income taxes accrued, stated capital, accumulated earnings, number of employees and tangible assets.
9. Brennan, W. (2014). BEPS country-by-country reporting: A game changer. *International Tax Review, 4*, 37.
10. Council Directive (EU) 2016/881 of 25 May 2016 amending Directive 2011/16/EU as regards mandatory automatic exchange of information in the field of taxation, GU L 146 del 3.6.2016, so-called DAC (4).
11. The SPE can be also the UPE of a group if the country of residence of the latter does not require CbC filing or if the SPE's filing is allowed by a jurisdiction. In this context, it must be pointed out that some jurisdictions may also require 'local CbC filing' to a resident that is not the UPE on its group if the UPE is not obliged in its residence jurisdiction, there is no qualifying competent authority agreement in place between two jurisdictions or there has been a systemic failure to exchange CbC reports.
12. Directive 2013/34/EU of the European Parliament and of the Council of 26 June 2013 on the annual financial statements, consolidated financial statements and related reports of certain types of undertakings, amending Directive 2006/43/EC of the European Parliament and of the Council and repealing Council Directives 78/660/EEC and 83/349/EEC Text with EEA relevance, GU L 182 del 29.6.2013.
13. It should be recalled that the EU Capital Requirements Directive IV of 2013 asked financial institutions to confidentially disclose relevant data, including tax payments to the Commission. Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC Text with EEA relevance, OJ L 176, 27.6.2013.
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22. On the subject of transfer pricing, more broadly Adonnino, P. (2008). La Prevenzione e soluzione delle controversie tributarie in sede internazionale. *Diritto e Pratica Tributaria,* 5, 10843–10849; AA.VV. (2011). Transfer Pricing and Dispute Resolution by Baker, A. Levey, M. M. IBFD; Valente, P. (2016). Transfer pricing: An overview of Italian Supreme Court's recent rulings. *Intertax, 44*(6/7), 564–570.
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24. Some countries have advanced the need to acquire further information in addition to those required by the CbCR, in particular on the economic flows of the taxpayer such as, e.g. payments to affiliates for interest expense, royalties and fees for services.
25. Avolio, D., & De Angelis, E. (2018). Documentazione sul transfer pricing e regime premiale per la penalty protection: casi controversi e possibili evoluzioni. *Fisco* (19), 1861–1865.
26. See Comm. Trib. Prov. Milan, 7 September 2017, n. 5233; Comm. Trib. Prov. Milan October 17, n. 6248, big suite database, Ipsoa.
27. This reference, as noted by some authors, raises some concerns on the legal reserve pursuant to art. 23 of the constitution: the determination of the subjects on which taxable amount is applied, is in fact entirely

delegated to an international body (the OECD), and in fact to the financial administration whose representatives are part of the business tax committee or the committee that approves the transfer pricing directives.

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29. For further details on the subject of friendly procedures without any pretension of exhaustiveness V. Trivellin, M. (2017). *Contributo allo studio degli strumenti di soluzione delle controversie fiscali internazionali*. Turin: Giappichelli; Grandinetti, M. (2017). Gli accordi preventivi per le imprese con attività internazionale. *Rassegna Tributaria* (3), 660–676; Formica, & G. Lillo, D. (2018). Transfer pricing e doppia imposizione: nuovi strumenti di risoluzione. *Fisco* (26), 2507–2514; Valente, P. (2017). Procedure amichevoli, procedure arbitrali e rapporti fisco contribuente. *Fisco* (5), 451–457; Comm. Trib. Prov. Lombardia 28 January 2018, n. 328, big suite database, Ipsoa.
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33. In France, for example, after the entry into force of the Finance Bill for 2014 the minimum threshold for full transfer pricing information has been established on 400 M €. Douvier, P.-J., & Dauluzeau X. (2014). New transfer pricing documentation obligations for large companies. *International Transfer Pricing Journal*, May/June, p. 154.
34. The CbCR is usually connected in almost all the countries where it has been established with the transfer pricing documentation. For example, all the information about intangibles within the group (development, enhancement, maintenance, protection and exploitation), intragroup financing arrangements, R&D activities, and benchmarking analysis—that

after BEPS has changed, and increased, a lot—is placed on the master or local file, not on the CbCR template. An exemption in this tendency is Switzerland where producing and keeping transfer pricing documentation it is not mandatory, even if during an audit procedure a corporation may be obliged to justify its policy in the field. Stocker, R., & Oosterheert, A. (2017). Update on country-by-country reporting. *International Transfer Pricing Journal*, July/August, p. 309.

35. Arts. 13.1, and 14, ES: Royal Decree 634/2015, of July, the 10th on Corporation tax regulations. The legal framework of this administrative rule is a general authorization to the Government to pass whatever regulation needed to apply effectively the Corporation tax (*Disposición adicional* 10th, ES: Law 27/2004, of November, the 27th on Corporation tax).
36. According to with unofficial sources, there were in Spain around 200 corporations in this rank (http://ranking-empresas.eleconomista.es/ranking_empresas_nacional.html). According with the OECD estimations only a 10% of the wide world MNEs are over this threshold, 750 M €, that is also the threshold stated by the EU, Directive 2016/881 and by the superiority of the countries that have enacted CbCR, as Japan (JPY 100 billion, roughly 750 M €). Therefore, in the United States—country where are hosted a huge average of the total amount of the ultimate partner MNEs—this threshold has been established in 850 M $ (Dorey, M. [2016]. US Country-by-country reporting requirement. *International Transfer Pricing Journal*, May/June, pp. 272–275). This threshold differences supposes that a Spanish subsidiary of an American ultimate parent, between 750 M € and 850 M $ turnover, may present CbCR in Spain for the whole group. In Switzerland the threshold, 900 M CHR (around 800 M €), is now—not in 2015 when it was adopted—higher than 750 M €. The effect of the gap, in this case, may be particularly grave, because in this country a master and local file documentation it is not ordinary required, so, it would be for a Spanish surrogate parent company CbC reporting in Spain for the whole group. The OECD Guidance—that it is not binding on the countries—resolves this problem considering that if an ultimate partner has not to present CbCR—according with the threshold expressed in its local currency—"should not be obliged to file a CbC report anywhere else in the world". Indeed, some scholars consider attractive for a ultimate partner in the edge of the threshold to swift its residence to Switzerland (Stocker, R., & Oosterheert, A. [2017]. Update on country-by-country reporting. *International Transfer Pricing Journal*, July/August, p. 311).
37. ES: Order HPF/1978/2016, of 28th December (http://www.boe.es/boe/dias/2016/12/30/pdfs/BOE-A-2016-12484.pdf).

38. Szmiscek, S. (2018). New hungarian transfer pricing documentation obligations. *International Transfer Pricing Journal*, March/April, p. 125.
39. http://www.oecd.org/ctp/exchange-of-tax-information/convention-on-mutual-administrative-assistance-in-tax-matters.htm. The exchange of information in a standardized form is done according to the Multilateral Competent Authority Agreement on the Exchange of CbCR, through a Coordinating Body Secretariat. Spain, with other 74 countries (2016), is signatory of both Treaties. Regarding European Union, DAC (4) states that the competent authority for receiving CbCR in each State member shall send forward the report to the others State members where the constituent entities are tax resident within fifteen months after the end of the MNEs fiscal year.
40. Martin Jiménez, A. (2016). La información país por país ("country-by-country reporting"), la interacción con el Derecho de la UE y su utilización como instrumento de política tributaria: algunas reflexiones. In T. Cordón Ezquerro (Ed.), *Fiscalidad de los precios de transferencia (operaciones vinculadas)*. Madrid: CEF.
41. Serrat Romaní, M. (2017). Los derechos y garantías de los contribuyentes en la era digital. Transparencia e intercambio de información tributaria, Ph.D. thesis (University of Barcelona) (in press by Thomson-Reuters Aranzadi), p. 499. The way for aligning the Spanish regime with the Directive would be, for instances, setting out some significant exemptions of information for these 'surrogate parent companies', as it has been done in Denmark (Wittendorff, J. [2016]. Country-by-country reporting. *International Transfer Pricing Journal*, March/April, p. 145).
42. Following the steps for checking when it was CbCR mandatory for surrogate parent entity, it is very clear that this situation will be unusual. Veldhuizen, R., & Teneketzis, L. (2016). Country-by-country reporting: Filing obligations and first implementation. *International Transfer Pricing Journal*, May/June, p. 202.
43. This has been, also, the model followed by other Hispanic countries, as Uruguay. Bonet, J., & Galeazzi, A. (2017). The new "transparency law" and the implementation of the base erosion and profit shifting project on Uruguayan transfer pricing regulations: Theory and problems to come. *International Transfer Pricing Journal*, September/October, p. 417.
44. COM (2016) 198 final. Some scholars have stressed serious doubts about the legal competence to disclose publicly CbCR, and about the justification of the measure in terms of proportionality (Seer, R., & Wilsom, A. L. [2016]. Tax transparency in the European Union. Regarding country-by-country reporting [Action 13 BEPS]. *EC Tax Review,* p. 353).
45. Art. 8aa.3 Directive 2011/16/EU amended by Directive 2016/881.

46. OECD, Transfer pricing documentation and country-by-country reporting, Action 13: 2015 Final Report, pp. 29–30. (https://read.oecd-ilibrary.org/taxation/transfer-pricing-documentation-and-country-by-country-reporting-action-13-2015-final-report_9789264241480-en#page1).
47. Apparently, neither the Spanish Form nor the OECD template requires the tax identification number, if there is, of each constituent entity. This is a key information—from the assumption that the information will be exchanged in digital format- that it is compulsory in the US system.
48. OECD. (2017). *Guidance on implementation of country-by-country reporting—BEPS Action 13.* Paris, France.
49. Meijer, T., Kerkvliet, S., & Van Stigt, B. (2017), Country-by-country reporting. All smoke and mirrors or the BEPS project's first success. *International Transfer Pricing Journal*, November/December, p. 433.
50. "More information may not be the answer, but more targeted information is. In this sense, the country-by-country reporting template should be as simple as possible." Grau Ruiz, M. A. (2014). European Union/OECD—Country-by-country reporting: The primary concerns raised by a dynamic approach. *Bulletin for International Taxation, 68*(10), 560.
51. Rasch, S., Mank, K., & Tomson, S. (2016). Country-by-country reporting. *International Transfer Pricing Journal*, March/April, p. 149.
52. http://www.oecd.org/tax/forum-on-tax-administration/international-compliance-assurance-programme.htm.
53. Dorey M., & Sala M. V. (2015). Cost-effective approach to manage country-by-country reporting compliance. *International Transfer Pricing Journal*, November/December, p. 401, propose a cost-minimization formula.
54. Nowadays the only way to manage fair and effectively a tax system is through a deep collaboration, particularly with large business, and a fluent cooperation with other tax administrations: "in a post-BEPS world, it is critical to have a strong, reliable government that will have a consistent, transparent and pragmatic approach to information exchange, and the same approach regarding international dialogue about the information that will be exchanged" (Oosterhof, D. [2016]. Regulatory documentation and country-by-country reporting requirements. *International Transfer Pricing Journal*, January/February, p. 76).
55. "Therefore, it is very reassuring that the Dutch government has explicitly stated how this information should be used (indeed, for risk selection purposes) and that country-by-country reporting as such should not be used for transfer pricing adjustment purposes" (Oosterhof, D. [2016]. Regulatory documentation and country-by-country reporting requirements. *International Transfer Pricing Journal*, January/February, p. 79).

56. "In a manner of speaking, recognizing that the source of income is essentially an arbitrary notion according to countries' tax laws, 52 the BEPS projects seemingly seeks nevertheless to establish what may amount to a universal notion of the source of income, not affirmatively or prescriptively but by establishing what the source is not. It does this, for example, by excluding the significance of organizational and contractual arrangements that mask the absence of observable business activity and the resources necessary to conduct that business autonomously." Wilkie, J. S., Master file, local file and country-by-country reporting: A Canadian perspective. *International Transfer Pricing Journal*, March/April, p. 126.

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