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REPUTATIONAL RISK MAPPING AND QUANTIFICATION

A Business Project with Energias de Portugal

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Abstract

Reputational Risk Mapping and Quantification – A Business Project with Energias de Portugal

Against the background of an increasing importance of reputational risk in today's business environment, this work describes an approach to categorize and quantify reputational risks. The developed methodology quantifies the negative impact of identified reputational risk categories based on data from financial markets. Following this, the developed methodology is specifically tied to EDP. Results show that the identified reputational risk categories Communities, Global Strategic Direction and Environment cause the greatest negative impact to EDP on a yearly basis. Finally, in a separate part, reasons contributing to an increased importance of reputational risk for corporations are analyzed.

Keywords:

Reputational Risk, Quantification, Financial Markets, Relevance of Reputational Risk

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1. Client Context

a) Client

Energias de Portugal, SA (EDP) is a vertically integrated Portuguese utility company, headquartered in Lisbon, Portugal. It was founded in 1976 and is now the largest Portuguese company based on market value (Forbes, 2015). EDP's operations cover multiple levels of the energy value chain. It is a generator, supplier and distributor of electricity as well as a supplier and distributor of gas. EDP employs more than 12,000 employees and is the largest energy company in Portugal. In addition, it is one of the largest electricity generators and gas distributors in the Iberian Peninsula. EDP is operating in 14 countries in total whereby its core countries, measured by customers, are Portugal (6 million), Spain (1,8 million) and Brazil (3,1 million). As a whole, EDP serves more than 11 million customers worldwide (Energias de Portugal, 2014a).

EDP's strategic vision for the future is to become *"a global energy providing company, leader in creating value, innovation and sustainability"* (Energias de Portugal, 2014a, p. 17). To attain its vision EDP defined a strategic agenda for the upcoming years until 2017. The agenda focuses, amongst others, on growth, greater efficiency and the preservation of a low risk business profile. While the low risk business profile is ensured by increasing diversification, growth is expected to be derived from its subsidiary EDP Renováveis. EDP Renováveis is a renewable energy company with a presence in USA, Brazil, and various European countries (Energias de Portugal, 2013a). This makes EDP the third largest wind operator worldwide (Energias de Portugal, n.d.-a). At the end of 2014, EDP had an installed power generation capacity of 22.5 gigawatt hours and produced about 60.2 terawatt hours in 2014, of which the majority was generated through renewable sources (Energias de Portugal, 2014a).

b) Market Overview

EDP is engaged in two main business areas: electricity and gas. The former represents EDP's main income stream and will be focused in the following paragraph. Generally, the electricity market can be divided into four separate segments: generation, transmission, distribution and supply. The production of energy occurs at the generation stage. Following this, the energy is transmitted in high voltage across long distances until it is distributed. Distribution networks transmit energy in low voltage from the transmission system to homes and businesses. Suppliers, in turn, buy energy in the market and sell it to customers (Energias de Portugal, n.d.-b). Depend-

ing on the country, each of these segments can be subject to different regulations (liberalized, regulated or a blend). EDP operates with differing emphases in all of these segments.

The contemporary economic situation in Portugal and Spain, has led to decreasing energy consumption. Electricity consumption in Portugal, for instance, declined by 2,1% from 46,241 billion kilowatt-hours in 2012 to 45,257 billion kilowatt-hours in 2013. Similarly, electricity consumption in Spain also declined from 240,248 to 232,009 and thus by 3,4% (Eurostat, 2015). These developments can also be observed for the gas market. Besides the staggering demand, the Iberian energy market and the Portuguese in particular are also facing significant regulatory changes. Portugal's energy market evolved rapidly over the last years due to the Financial Assistance Program that was linked to various reforms. It accelerated the privatization of EDP and supported the phase out of regulated gas and electricity retail tariffs (European Commission, 2015). The transition period is ending in 2015 leaving the Portuguese energy companies in a free and presumably competitive market (ERSE, n.d.). Due to the liberalization of electricity and gas supply in Portugal and Spain customers can now freely choose their supplier. Those who have not chosen a supplier yet are supplied by last resort suppliers. However, due to the former monopolistic structure, the retail market still remains concentrated (Energias de Portugal, 2014a).

EDP's competitors are Iberdrola and Endesa (electricity and power supply), as well as Gas Natural and Atlantic (gas) (Energias de Portugal, 2012b). These companies have either global operations or a focus on Iberia and Latin America, the latter being similar to EDP. Likewise, they are vertically and partially horizontally integrated (Investec, 2013). When examining only the Iberian market based on data from 2013, Endesa leads the electricity generation market with a market share of 34% before Iberdrola, EDP and Gas Natural with 24%, 18%, and 18%, respectively. Similarly, Endesa also leads the regulated electricity retail with a market share of 34% before EDP, Iberdrola, and Gas Natural with 28%, 24%, and 13%, respectively. The free retail shows similar results (Energias de Portugal, 2013b).

c) Current Client Situation

According to António Mexia, chairman of EDP's executive board of directors, the company is operating in a "*challenging and changing sector*" (Energias de Portugal, 2013a, p. 7). Although EDP's market share in the electricity and gas market rose in Portugal as well as in Spain, the macroeconomic downturn described above led to a decreased demand for electricity and gas. Consequently, EDP's excess capacity increased and electricity and gas supplied in Iberia de-

creased. Moreover, the liberalization of the energy market in Portugal and Spain constitutes another challenge. As a result, turnover and net-profits decreased slightly from 16,339 in 2012 to 16,103 (-1,4%) in 2013 and from 1,012 to 1,005 (-0,6%). However, EDP was able to increase its net profits in 2014 to 1,040 (+3,5%) due to tight cost control and good energy management (Energias de Portugal, 2014a).

The extinction of tariffs increased the number of customers situated in the free market. Consequently, energy companies like EDP need to adapt to this new situation, paying more attention to competitiveness and presumably increase efforts to maintain its image, which represents a significant asset in the until now concentrated energy market in Portugal. Although EDP was still leading the (liberalized) Portuguese electricity and gas market in 2014 by far with a market share of 86% and 81%, respectively (Energias de Portugal, 2014a), it realized the increasing importance of remaining competitive. For example, through increasing marketing efforts to attract the private customer base (Energias de Portugal, 2012a). Moreover, EDP's experiences a considerable development in the sale of energy related services and products for private customers as well as businesses (Energias de Portugal, 2014a).

d) The Business Project Challenge

Against the backdrop of increasing competition and EDP's key strategic priority of keeping a low risk business profile, reputational risk management takes on greater significance. Not surprisingly, EDP's risk management department, which is responsible for assessing the group's risks and assisting the executive board in monitoring and mitigating them, is developing a risk map of the EDP group in close collaboration with relevant risk owners of various business units. The overall goal is to develop a comprehensive and quantitative-based assessment of key risks of EDP. This exercise has already been completed in areas in which i) risks are due to their nature easily quantifiable, ii) where empiric evidence and quantitative data is available and iii) a risk culture is prevalent. A perception of further relevant risks to EDP appears in certain areas; however, its mapping is still incomplete or not yet expressed quantitatively (Energias de Portugal, 2014b).

With that said, the business challenge is to extend EDP's current risk mapping structure by reputational and fraud risks. Reputation and fraud risk are due to their nature difficult to identify as well as challenging to quantify and have therefore been left out. Thus, the objective of the business project is to identify EDP's main reputational and fraud risks and to develop a methodology to quantify these risks in terms of probability and financial impact.

2. Reflection on the Work Done

a) Problem Definition

In times of increasing scrutiny through consumers, media and politicians, small incidents can trigger considerable consequences. Therefore, upper management considers reputational risk as a major concern in today's risk landscape. A study conducted by Clifford Chance (2014) outlines that more than one-half of the board members are focusing on reputational risks. With these results, only financial risks received more attention from executives. Consequently, once an incident occurs, board members rate the potential damage to the companies' reputation and brand as the greatest concern (Clifford Chance, 2014). Another study conducted by EisnerAmper (2014) reveals similar results. Executive boards, who were asked in this study, rated reputational risk aside from financial risk as the most important risk they are facing today. Reasons why directors rate reputational risks as crucial are plenty fold as captured by the following statement of a surveyed board member: *"Reputational risk impacts everything; our ability to attract and retain talent, customers, shareholders, banking partnerships, etc..."* (EisnerAmper, 2014).

Furthermore, past incidents exemplarily underline the importance of managing reputational risks, and show that these incidents can lead to considerable economic losses. E.ON, for example, was operating a coal and oil power station in England and planned to replace it with a modern coal plant to comply with European law. Opposition, however, gathered quickly because the new plant would represent England's first new coal powered plant since ten years. Greenpeace and other campaigners started protests lasting from 2008 until 2010 when E.ON decided to withdraw its plans due to economic reasons (Webb, 2010). Another and very recent example affects EDP. On the 20th of April in 2015, the Portuguese Energy Services Regulatory Authority (ERSE) announced it will investigate several companies, among them EDP, for various irregularities in the electricity and gas market. EDP is suspected of applying illegal social tariffs and the misreading of clients' meters. If these suspicions turn out to be true, EDP can face a fine of up to 10% of its annual turnover (Prado, 2015).

b) Methodology

i) Objectives

Against this backdrop, the importance of managing reputational risks and the rationale behind EDP's intentions to extend its current risk mapping by reputational and fraud risks becomes clear. The concrete goals EDP wants to attain with the project can be divided into three objectives:

1. Development of a comprehensive risk categorization framework that identifies potential reputational risk categories.
2. Elaboration of a quantification method for estimating the expected market impact of each reputational risk category, including both the estimated impact and the probability of an event of that particular category.
3. Application of the method to EDP by estimating the yearly expected market impact; therefore enabling the prioritization of reputational risk categories.

The methodology chosen to proceed with the objectives can be divided into four sections. First, a theoretical foundation is derived by defining reputational risk and examining the relation between incident, stakeholders and impact. Second, a reputational risk categorization framework is developed by following a two-fold approach. On the one hand, a rich repository of reputational events was collected. These events were categorized individually and successively clustered to higher level categories. On the other hand, literature was used to collate the developed category structure with existing frameworks. Third, the aforementioned repository of reputational events was used to calculate the impact of each event and the probability of an event belonging to a specific reputational risk category. Finally, the probabilities and impacts were used to prioritize key issues for EDP. This was accomplished by suiting the previous calculations specifically to EDP.

ii) Analysis

Introduction

Before addressing the first objective, namely the identification of reputational risk categories, it is necessary to develop a theoretical foundation for the concept of reputational risk. According to the Economist Intelligence Unit (2005), two main perspectives on reputational risk can be distinguished. Reputational risk can, on the one hand, be seen as a separate, unique and distinct risk category. On the other hand, reputational risks can be interpreted as originating from and as a consequence of other risks (Economist Intelligence Unit, 2005). Other authors also distinguish a third perspective on reputational risk. They view reputational risk as both a distinct risk category but with linkages to other risks, thus it does not exist on a standalone basis (Smith-Bingham, 2014). The design of the first objective tacitly implies the notion that reputational risk is seen as consequence of other risks. The necessity of developing a category structure underlines the tacit assumption that reputational risk emerges from categories other than reputational risk itself.

Thus, the second perspective is adopted and fraud risk is interpreted as one of various sources leading to reputational risk.

Based on this meta-understanding, definitions of reputational risk from several sources were analyzed. Despite the multitude of definitions, there is a common understanding regarding the main concept of reputational risk. As highlighted on slide 11 of the business project report, several definitions emphasize, for example, that reputational risk originates from not meeting stakeholders' expectations due to internal or external events. Based on these insights, the following definition of reputational risk was developed and taken as a basis for this project.

“Risk arising from uncertainty in the perception of the organization or its supply chain by its stakeholders that is triggered by an internal or external event or the organization’s business practices that potentially causes quantifiable or non-quantifiable short-term and long-term losses for the organization as an outcome of other risks.”

The rationale behind this definition is that incidents are either triggered by internal (e.g. injured employees) or external events (e.g. accusations) or the organization's business practices (e.g. unsafe working conditions). These events can be perceived negatively by stakeholders which can be divided into transactional and tangential stakeholders (Manjarin, 2012). While, transactional stakeholders have a transactional relationship with the company, tangential stakeholders do not have a direct connection to the corporation. However, the latter stakeholder group comprises NGO's, media and the boarder society which influence transactional stakeholders. As a result, once an incident occurs transactional stakeholders might directly withdraw commitment to a company or do so because of pressure and influence exercised by tangential stakeholders. As a consequence, a company might face negative direct or indirect impacts. Direct impacts have immediate financial impact on the company's balance sheet. For example, administrative penalties and fines reduce a company's wealth immediately. In contrast, indirect impacts cannot be easily transformed into monetary figures. Indirect impact comprises consequences such as loss of customers or loss of talent and appeal as an employer (Manjarin, 2012).

Therefore, in line with the above-mentioned definition, reputational risk represents the potential negative impact that originates from a twofold causality. Once an event of a particular category occurs, it can be perceived by company's stakeholders in a sense that does not match with their expectations, thereby harming relations and leading to negative impact for the company.

Categorization

With this theoretical foundation in mind, the first objective was addressed. To create a comprehensive category structure of reputational risks, a two-fold approach was adopted.

First, the categorization was approached from bottom-up perspective. An extensive repository of negative reputational events was created. These events were collected with help of RepRisk—an online database that systematically collects and processes negative incidents, criticism and controversies about companies worldwide. With the support of this tool a sample of about 1,000 events out of a universe of approximately 7,000 negative events was collected. Unfortunately, the sample is not representative, since energy related events and certain companies are overrepresented. A relatively large sample was needed because of two main reasons. First, a comprehensive sample is crucial in order to cover the majority of negative events that can potentially happen. Second, a large sample is beneficial for the estimation of probabilities and impacts in the upcoming section of the project. Each event of the sample is described by several dimensions (e.g. company, date, country, etc.). To derive a category structure, topics were assigned to each event individually. Following this, similar topics (3rd level) were clustered to higher level categories (2nd level) which were again clustered to top level categories (1st level). Thus, in the end, a category structure spanning three levels was created by merging similar and related topics into coherent, and as far as possible mutually exclusive clusters.

Second, existing reputational risk frameworks were used to critically review the above developed category framework from a top-down perspective. Despite the broad range of literature on the topic of reputational risk, no consistent framework for the characterization of sources leading to reputational risk was found. The reason behind this finding might be the variety of ways reputational risks can be clustered, namely by corporate function the risk originates from (e.g. quality management, accounting), by type of topic the risk challenges (e.g. ethics, environment) or by problem (e.g. bad conduct, questionable judgment). Against this backdrop, several frameworks from various sources were used to not only critically review the category structure but also to counter challenges associated with the unrepresentative sample. An excerpt of the frameworks used to review the developed category structure can be found on slide 13 of the business project report. Based on the findings of this review, the repository was complemented by another 50 events which led to adaptations of the initial category structure. Therefore, the final dataset consists of 1050 events.

Based on both approaches, a category framework was developed that categorizes common reputational events across three category levels. Although the category structure is primarily based on empirical research in the sense that it relies on a large sample of events, it became apparent during the process and through discussions with EDP that the elaboration of a risk categorization framework is rather art than science. Therefore, the categorization is as comprehensive, exhaustive and mutually exclusive as possible given the methodological boundaries. Moreover, the category structure has been reviewed several times and adapted to EDP's specific needs. The final first level categories are *Performance*, *Governance*, *Client Service*, *Human Capital*, and *Corporate Citizenship*. The entire category structure can be found on slides 15 to 22. The analyses of the following two objectives will focus on the second level if not stated otherwise.

The categorization is not only an integral part of the upcoming quantification but it also yields valuable information on its own. While Corporate Citizenship and Performance are the categories with the most events in the sample, Client Service has by far the smallest number of events, as highlighted on slide 31 of the report. This fact is not surprising, since energy companies unlike manufacturing companies neither have tangible products nor particular tight customer relationships that could expose them to considerable reputational risk. Nevertheless, according to the sample, highly relevant reputational risk categories for energy companies are Corporate Citizenship and Performance. Against this backdrop, especially the second level categories pollution (environment) and inappropriate sourcing (business conduct) stand out for the majority of energy companies. Moreover, while events in developed countries are more concerned about environment and anti-competitive behavior, events in developing countries often concern working conditions and working safety as well as union forming. This finding reminds of Maslow's (1943) hierarchy of needs but applied on a higher social and business level. While developing countries are more concerned about the physiological and safety needs (e.g. working conditions in coal mines), developed countries, where acceptable working conditions are commonly ensured, needs go beyond safety and comprise environment as well as orderly competition.

Impact and Probability

Based on the aforementioned repository of reputational events and their respective reputational risk categories, the second objective, namely the estimation of the expected market impact is addressed. At first, the impact will be quantified before the calculation of probabilities is focused.

First and foremost, it is important to distinguish the quantification of reputation from the quantification of reputational risks. While Scandizzo (2011) outlines that various models exist to assess and measure a corporation's reputation, the quantification of reputational risk still remains a challenge. Various researchers have approached this challenge although the term "approached" needs to be emphasized in this context. According to Perry & Fontnouvelle (2005), reputational risk is still a rather elusive risk due to the difficulty of measuring it and the lack of understanding its actual origins. In a similar vein, Regan (2008), acknowledges that the severity and probability of reputational events cannot be measured with today's analytical tools. Similarly, Arena, Conte, & Vantini (2010) state that due to the intangible nature of reputation, qualitative assessments prevail until now, as the dominant form of assessing reputational risk.

An analysis of existing research indicated that prevalent approaches that try to measure reputational risk are following two different methodologies. Although both methodologies try to measure an expectations-reality gap—thereby creating a link to the underlying definition of reputational risk—each methodology uses different inputs. On the one hand, are approaches that try to measure the gap based on surveys and company performance data. On the other hand, are approaches that measure the very same gap but by taking advantage of public financial information.

The approaches of Scandizzo (2011) and Eccles, Newquist, & Schatz (2007) belong to the former methodologies. Scandizzo (2011), for example, measures reputational risk by assessing a gap between stakeholders' expectations and actual company performance. While stakeholders' expectations are measured through surveys, performance is measured by specialized audits which focus on a company's commitment to reach certain objectives. This information is then used to create potential scenarios for which a quantitative assessment can be performed. Eccles, Newquist, & Schatz (2007) suggest a similar approach. According to the authors, a company faces significant reputational risk when its reputation is more positive than the actual underlying reality. They measure a company's reputation based on, amongst others, surveys of stakeholders and media analysis. The reality, namely the company's ability to match stakeholder's expectations is evaluated by honestly assessing the company's performance with respect to previous years and peers. While these methodologies have the advantage of incorporating stakeholders' expectations, they also face several disadvantages. Conducting surveys with stakeholders requires not only access to them but also the time to collect a large sample of data that allows deriving reliable information. Moreover, transforming expectations into quantitative measures is another challenge that these

methodologies face. Lastly, such approaches assesses reputational risk as a whole detached from any particular event and are therefore incompatible with the developed repository of events.

Approaches based on public financial information are, for example, adopted by Perry & Fontnouvelle (2005) and Arena, Conte, & Vantini (2010). Perry & Fontnouvelle (2005) analyze the announcement of major operational loss events and their impact on a firm's stock price. Based on a sample of 115 operational loss announcements, they compare the actual stock price reactions adjusted for changes in the market to the amount of the announced losses. Reputational loss occurs when a firm's market value declines by more than the announced loss amount. Arena, Conte, & Vantini (2010) follow a similar approach. They gathered 75 negative events that appeared in an international newspaper and classified them into several categories. They attributed stock price deviations during a particular timeframe before and after the event to the respective incident and therefore calculated reputational risk based on the percentage decreases of the stock price. These approaches have the advantage that they are based on financial information that is publicly available. Anyway, it has to be acknowledged that stock price movements are not solely determined by the new information of the negative event. Stock prices are, according to the efficient market hypothesis, reflecting all available information affecting future payments of a company (Bradfield, 2007). Hence, the actual impact of the event cannot be determined accurately; however, it can be tried to approximate the impact.

With this said, the financial market approach suggested itself. Such an approach complements the already developed repository of reputational events very well. However, due to the fact that the repository does not entail operational loss announcements, the approach will be adapted.

To evaluate whether an event has impact on a company's stock price, as outlined above, it is necessary to know two pieces of information: expectation and reality. Similarly to the previous work, the developed approach compares returns derived from changes in a company's market capitalization with expected returns. Expected returns are derived by using the Capital Asset Pricing Model (CAPM). Pivotal to the CAPM is the security market line which shows the expected return of securities as a linear function of their beta. A company's beta is a measure of systematic risk—that is the amount of risk that cannot be diversified by holding a diverse portfolio of stocks. Therefore, it measures the sensitivity of a securities' return to the return of the market portfolio. The underlying assumption of the CAPM is that unsystematic or firm-specific risk can be diversified, therefore investors solely want to be compensated for bearing systematic risk—that is the risk

that affects the economy as a whole (Berk & DeMarzo, 2014). Therefore, the approach depends on the validity of the CAPM.

$$E(r_i) = \beta_i * r_m \quad \text{EQUATION 1}$$

Against this background, the expected return of a company i is determined by the market return multiplied by the company's raw beta, as shown in equation 1. The return of the market is given by the return of a market proxy. To reduce the complexity of the model only two market indices, the Eurostoxx and the S&P500 were used as proxies. The multiplication of both variables yields the expected return (expectation).

Reality, namely the actual return r_i over a given period is calculated by a plain return formula. It is the change in market capitalization divided by the original market capitalization.

$$\text{Event Impact} = r_i - E(r_i) \quad \text{EQUATION 2}$$

Consequently, the event impact is computed by deducting the expected return from the actual return (equation 2). Since we assume that financial markets are efficient, new information about the reputational event should be immediately reflected in the stock price since it might impact future payments of a company due to direct or indirect impacts.

These calculations were performed for 876 of the 1050 events. Moreover, each event impact was calculated based on three different timeframes. The timeframes start one day before the event happened and end one day, five days or twenty-two days after the event occurred. This way, it is possible to analyze how fast the impact faded away, whether it has a lasting effect, a delay or no impact at all. If stock exchanges were closed (e.g. on a holiday) the immediate following date was considered in the calculation. These individual event impact calculations were then aggregated on category level (second level) by using the arithmetic average allowing the analysis of the average event impact per category.

Although the event impact calculation was performed for 876 events, a subsequent analysis is mainly based on only 382 events. The reduction from 1050 to 382 events can be explained by several reasons. First, redundant events and events with abnormal positive and abnormal negative returns have been removed. Secondly, events of not publicly listed companies have also been excluded, as access to financial information is required. Finally, events of non-energy companies and events with positive impact have also been left out. Although the sample consists solely of public criticisms and negative news, about half of the events have positive returns close to zero.

This fact can be explained by the significant amount of uninfluential criticisms that RepRisk collects in its database. Many events listed in RepRisk are merely accusations of NGO's and claims about hypothetical consequences of a company's actions. These claims concealed serious events with actual impact—representing an interesting insight—and were consequently excluded from the analysis. The aggregated average negative impact per second level category can be found on slide 38 of the business project report.

The last part of the second objective is concerned with the calculation of probabilities. Under the assumption that an event happens, the probability should reflect the likelihood of an event of being of category x .

$$P_x = \frac{\#Events_x}{\#Total\ Events} \quad \text{EQUATION 3}$$

As shown in equation 3, the probability of event belonging to a particular category x is calculated by the division of the sum of all events of a particular category by the total number of events. The slide 43 of the business project shows the probabilities of all second level categories. As mentioned before, the underlying sample is not representative. Therefore, probabilities have to be treated with caution and are solely used for broad estimations and prioritizations.

Combining both the impact and probability allows illustrating them in a coordinate system as shown on slide 45. According to the graph, the second level category Communities and Global Strategic Direction are most common and have a high negative impact on average. Events categorized as Working Conditions, Compliance, and Business Conduct are less probable but still have a considerable negative impact on average. The categories Employment and Customer Relationship Management have a low impact and probability presumably because of their small representation in the sample. What is interesting to see is that the sample does not yield categories with high probability and low negative average impact. Apparently once the sample size of a category increases, the number of events with relatively high negative returns in that category also increases, thereby driving the average negative impact up.

Applicability to EDP

The third and last objective of the project is the application of the method to EDP by estimating its (yearly) expected market impact (EMI). Although the EMI can be computed based on the previously calculated probability and average impact, essential connecting pieces are still missing: methods to suit the calculations specifically to EDP.

The impacts and probabilities are calculated based on a sample that consist of various energy companies. Each of these companies might have a different focus (e.g. on generation, transmission, distribution and supply); and as a result might perceive certain stakeholders as more or less important. To make the calculations as relevant for EDP as possible, an “Applicability Index” (AI) was developed. This index links the generic EMI to EDP. It has the sole purpose of connecting stakeholders’ main concerns for certain reputational risk categories with the importance these stakeholders have to the EDP. This logic follows the previously described causality between event, stakeholders and impact. The AI gives each risk category a weight, which reflects how important it is and applies this category to EDP.

$$Applicability\ Index_x = \sum_{s=1}^S (CSS_{x,s} * SSE_s) \quad \text{EQUATION 4}$$

The applicability index for a category x consists of two components: the Category Significance per Stakeholder (CSS) and Stakeholder Significance for EDP (SSE). The CSS links all second level categories with stakeholders that perceive this category as important. This linkage is created through a table with binary values that indicate whether or not a risk category is relevant to the particular stakeholder s of EDP. The binary values were derived by analyzing internal EDP documents. The entire CSS table can be found on slide 48 of the business project report. In contrast, the SSE links the AI to EDP, and can be found on slide 50. The SSE represents the importance of the particular stakeholder to EDP. It is derived from a survey in which EDP’s business units were asked to rate the importance of stakeholders to their business unit on a scale from one to four. Based on these results, a weighted average based on turnover was calculated.

The final AI of a category x is eventually given by the sum of all factors between the CSS and SSE. Consequently, the AI gives more weight to categories that are important to the more relevant stakeholders of EDP. A table with the AI values can be found on slide 51.

To prioritize the risk categories, the generic EMI and the AI can be combined, as highlighted in equation 5, to calculate joint measure, the Risk Prioritization Index (RPI).

$$Risk\ Prioritization\ Index = E(i) * AI \quad \text{EQUATION 5}$$

The RPI is the product of the EMI and AI. This figure yields the EMI of a particular category adjusted for the importance that the risk category constitutes to EDP. The RPI for all second level categories can also be found on slide 54. Based on this table, EDP is able to assess which reputa-

tional risks to focus on. For example, when examining the aforementioned table, it can be concluded that events regarding Global Strategic Direction, Communities and Environment possess a higher RPI and therefore are more important for EDP than other categories.

However, when comparing the columns on slide 54, a relationship between the AI and the EMI can be assumed. Analyzing the relationship between EMI and AI's components CSS and SSE closer, it becomes apparent that these measures indeed have noteworthy correlation, as highlighted on slide 55. Thus, the EMI reflects the CSS and SSE surprisingly well (or the other way around). This is presumably the case because the sample consists mainly of energy companies that reflect EDP's concerns adequately. If the sample would be more diverse (e.g. not energy focused), then it can be assumed that the AI would add more value by driving the results in different directions instead of reinforcing them. Hence, the AI does not add significant value; rather it reinforces the existing results and is therefore disregarded in the further calculation.

Against this backdrop, the AI is not used to suit the EMI calculation specifically to EDP. Therefore, the final EMI simply calculates, as shown in equation 6, the expected market impact that a second level category level x may cause to EDP based on its past exposure to reputational events.

$$EMI_x = AvgImpact_x * P_x * \#NegEvents_{EDP} * MarketCap_{EDP} \quad \text{EQUATION 6}$$

The EMI of a category x is calculated by multiplying four variables. First the average negative impact of category x is multiplied with the probability of an event being from category x . These two variables depend on the respective category, which were calculated in the previous chapter. This figure is then multiplied with the following two EDP specific multiplicands: the number of EDP's yearly negative reputational events and its current market capitalization. As a consequence, the result yields the monetary impact that originates from the particular category throughout one year.

The number of yearly negative events registered by EDP is calculated by the total amount of reputational events registered by EDP multiplied by the industry average of a reputational event having a negative impact. According to RepRisk, the number of EDP's reputational events registered in 2014 amounts to seven. This number is multiplied by the industry average of 50,7% (according to the underlying sample), which adjusts the number to the amount of events that actually have a negative impact. Hence, the number of negative events per year for EDP equals to 3.55.

As highlighted on slide 59, the methodology estimates that all negative variations of the market capitalization of EDP triggered by reputational events within a year amount to €1,37 billion.

Communities, Global Strategic Direction and Environment are the three categories with the highest EMI, therefore expected to cause higher negative impacts to EDP. This impact cost EDP a rough estimate of about €0,94 billion yearly. In contrast, Customer Relationship Management, and Employment are expected have the smallest impact on the market capitalization.

It has to be acknowledged that the figure of €1,37 billion appears to be high at a first glance. When putting the figure in context, it becomes more realistic. First, the figure includes both direct and indirect impacts. As this work assumes that financial markets are efficient, direct and indirect impacts are reflected in the stock price. Therefore, the €1,37 billion consists of direct impacts which reflect an actual loss of money and indirect impacts. While the former is not recoverable, indirect impact can be recovered. In this regard, it has to be admitted that the potential recovery—if not happened during the timeframe—is not considered in the methodology. Depending on the event and how stakeholders perceive and treat it, a temporary loss of market value is imaginable. Thus, the immediate negative impact of an event, which is calculated with this methodology, does not necessarily reflect a lasting loss of market value. Secondly, when studying past events of EDP, it can be seen that the above mentioned total EMI is not unrealistic. For example, on the 24th of July 2012, EDP was criticized for benefiting from excessive rents and harming tax-payers interests (Cavaleiro, 2012). In a time window of minus one and plus five days relative to the event, the market capitalization decreased by €268 million. Therefore, when putting this amount in context to the estimated impact of €1,37 billion for a whole year, the estimated EMI becomes more reasonable.

Work Plan

The initial work plan has changed slightly during the course of the project. The initial work plan consisted of four objectives: categorization, quantification, application, and the proposal of concrete initiatives to manage reputational risk. The main reason responsible for the work plan change is the unrepresentative sample and the complexity of the quantification of reputational risks. Due to a biased sample the calculations were based solely on a small subset of data that consisted solely of energy companies. Therefore, the quantitative results are not as meaningful and generalizable as was initially planned. Moreover, due to time constraints resulting from challenges encountered during the quantification, an optional topic, namely the proposal of concrete initiatives to manage reputation has been dropped upon consultation with the business advisor.

c) Limitations and Concerns

As already partially outlined during the course of the thesis, the sample and the chosen methodology comprise certain limitations. With respect to the sample, it cannot be ruled out that it comprises all common reputational events. For instance, it's possible that certain events may not receive enough publicity to be mentioned in RepRisk. Thus, the category structure cannot be treated as fully comprehensive. The category structure is also not fully mutually exclusive as certain events (e.g. nuclear incidents) affect the broader environment and thereby multiple of the identified categories. Additionally, the sample is not representative as it is biased in terms of companies, industries, and years. Therefore, results have to be treated and interpreted with caution. Finally, after the data cleansing the sample was considerably downscaled leaving certain categories with a small sample size, therefore questioning the result validity.

The quantification methodology also entails limitations. First, the market capitalization might not be the best indicator for reputational impact, because it is influenced by many various factors beside the actual reputational event. Moreover, the methodology is based on the CAPM, which relies on certain unrealistic assumptions (Pandey, 2009). Also, events with small negative returns have been attributed to the reputational event, when in fact they can also originate from other factors affecting the input variables. Furthermore, the timeframe selection is to some extent arbitrary. Finally, the event date has been adopted from RepRisk and its accuracy is not fully ensured as the date mentioned in RepRisk can deviate from the date the event actually happened.

d) Conclusions and Recommendations

As already mentioned at the beginning of this thesis, and in line with the limitation and concerns mentioned above, it can be understood as to why qualitative assessments prevail as the dominant form of assessing reputational risk. This business project aimed to challenge the status quo providing an approach to measure reputational risk quantitatively, and providing an approach specifically suited to EDP. Against this backdrop, this work can be seen as one approach to measuring reputational risk, but clearly outlining the need for EDP to further research on the topic. Especially a representative sample can derive more accurate results. Moreover, EDP has to pay attention to what extend the results need to be regularly updated, since new risks emerge quickly in today's ever fast changing environment, and existing risks might change in its importance level. Hence, a rather and complex and effortful approach to assess these risks might prove to be uneconomic. Furthermore, the derived results do not provide enough information to

actually act on the risks themselves. They rather give an overall overview of the reputational risk landscape. Hence, standardized strategies do not do justice to the variety of individual events that are behind a category such as “Community”. Thus, EDP is recommended to complement these results with further information about the reputational risk (e.g. influence on the risk or degree of trust erosion in the company) on a more detailed level.

3. Reflection on Learning

a) Previous Knowledge

While I had little experience with reputation, I had even less experience with risk management. However, the concept of reputation as well as the business project itself created a link to a few classes and touched upon essential theories that I encountered throughout my studies.

When applying recent theories that explain corporations’ success, it becomes apparent that reputation is best explained by the resource-based view of a company with which I came in touch during the class Strategy II at Nova SBE. The resource-based view of a company describes that a competitive advantage of a company is based on its resource endowment with valuable tangible or intangible resources. If these resources are valuable, rare, inimitable and non-substitutable, a competitive advantage can be developed and sustained over time (Barney, 1991). With that said, it becomes clear that reputation can be an essential resource of a company. It is by nature rare, difficult to imitate and to substitute, and depending on how well the reputation is developed also considerably valuable. In addition, the course Financial Management which I attended at Nova SBE was helpful for the project. It gave me fundamental insights about financial markets and essential theories such as CAPM. Both were important and highly valuable for the project. However, the business project made me also aware of certain shortcomings and limitations of the CAPM that led me to adjust previous knowledge.

b) New Knowledge

Introduction

This thesis rests on the claim, as outlined through several studies in the beginning, that reputational risk is becoming more important. This claim is founded on the fact that executives rate its importance considerably higher than in the past. Certainly, the importance of reputation itself has been well established by researchers. Favorable reputation, for example, attracts investors, customers, and employees (Fombrun, 1996). Yet, the results of the previously mentioned publications emphasize an increasing importance. Unfortunately, the reasons for an increasing im-

portance are not explained further by these studies. Thus, I decided to focus on these reasons by analyzing recent developments contributing to an increased importance of reputational risk. This allowed me to grasp the relevance of reputational risk for today's corporations.

I learned that the increasing importance can be attributed to blend of economic, social, technological, political and legal developments that partly reinforce each other. Based on this understanding, I was able to derive implications for today's reputational risk management.

The Increasing Importance of Reputational Risk

Technological advances are one element that strengthens the importance of reputational risk. For instance, global communication channels and the constant presence of media (recently strengthened through mobile devices) are factors that increase the importance of reputational risk (Sieler, 2007). Bad news do not only travel quickly from one place to another but can essentially be read at any place whether on the move, at home, or at work. This trend is paired with the growth of social media through which incidents can escalate quickly, which threatens reputation more than in the past (Deloitte, 2014). Individuals can broadcast their opinion through blogs or social media networks without any censorship or code of conduct. Therefore, whether an opinion is legitimate, an expression of sensationalism, or even deliberately wrong, does not underlie any control. Thus, accusations and rumors can be spread by anyone with access to social media thereby having the potential to cause considerable reputational damage (CIMA, 2007). Exemplified is the development partially by the way we approached the business project. Pivotal to our approach was RepRisk, an online tool that gathers negative incidents, criticism and controversies about corporations worldwide. It gives access to numerous reputational events thereby making corporations more transparent, and storing harmful information to a corporation's reputation for the long term.

However, not only new communication channels and online platforms but also other technological developments (e.g. cloud computing etc.) contribute to an increased importance of reputational risk management. In today's digital age information technology is an essential part of an organization. Therefore, once an IT system fails (e.g. stolen customer data etc.) a corporation can expect considerable consequences for its reputation. For example, in a study conducted by IBM, 61% of the surveyed executives state that IT security breaches are the greatest threat to their corporation's reputation (Lovejoy, 2012). Intensified are these risks by recent scandals (e.g. NSA surveillance) that increase stakeholders' sensitivity to data privacy issues. Furthermore, new technologies emerge swiftly and are adopted quickly in order to not be left-behind by competi-

tion. This leaves corporations less time to fully adapt to them. Therefore, these technologies are less controlled than traditional IT solutions and offer more potential for reputational risk.

Another trend is increasing scrutiny and increasing demands of stakeholders. This development is partially reflected in the growing understanding that corporations are not only constrained to obeying the law while maximizing shareholder value (Friedman, 1970), but an understanding that companies carry more responsibility and should incorporate various stakeholders since they have a legitimate claim on the corporation (Freeman, 2010). Furthermore, over the past two decades there has been an increase in demands and expectations but also an increase of influence of stakeholders on corporations. Nowadays stakeholders are often included in the decision making processes of corporations, because without their implicit permission a corporations legitimacy can be threatened (Rayner, 2003).

Also, growing awareness allows consumers become critical about the role companies play in society. They are constantly increasing their non-financial concerns. For instance, concerns such as ethics, sustainability, and responsibility are more and more incorporated in purchase decisions (Tucker & Melewar, 2005). Similarly, external bodies such as NGO's evaluate and rank corporations according to demands and expectations, and publicize the results accessible for everyone. In addition, economic power shifts from governments (countries) to corporations underline one of various rationales behind increasing expectations. Out of the 100 largest economic entities based on revenue, only 29 are countries while the rest are corporations (Chowla, 2005). Not surprisingly, corporations are confronted with increased expectations. They are expected to not only meet standards in developed and developing countries, but partially even to take on governmental responsibilities. Moreover, these stakeholders have more power than before, when accusing a corporation or rightfully stating that a corporation violates laws or standards because they can reach individuals through the internet on a global scale thereby mobilizing protestors across the globe (Tucker & Melewar, 2005).

Against this background, it also has to be pointed out that once an organization complies with expectations or criticisms of stakeholders, it cannot assume to reach a satisfaction equilibrium. Once an organization complies with external demands and satisfies its stakeholders, expectations of exactly these stakeholders will increase. Therefore, while the overall social business performance increases, criticisms do not decline due to increased expectations (Carroll & Buchholtz, 2014). However, the downside for businesses is rising once former expectations that a company

complied with (e.g. to differentiate the company from others) are not met. While the above mentioned view underlines reputation from a perspective of differentiation and heterogeneity, as corporations try to differentiate themselves from competitors, increasing stakeholders expectation can also be explained from a perspective of homogeneity. Institutional theory explains why organizations conform to common standards. This is because corporations are pressured to adopt and operate by common and proven norms, which provide them with legitimacy. Thus, as explained previously, once corporations comply with expectations or criticisms, for example, through a change in business conduct, these changes become standards over time. They become standards because these changes are mimicked by other corporations providing them with legitimacy. Consequently, standards are rising, and if corporation do not keep up with evolving standards, the reputational downside can be considerable.

Advancing globalization can be seen as another reason contributing to the increasing importance of reputation and its risk management. Throughout the recent decades, tariff and non-tariff barriers have been decreased, while agreements fostering, trade, investments and collaboration have simultaneously been introduced. These developments are still continuing as best exemplified by the Transatlantic Trade and Investment Partnership (TTIP) negotiations. As a result, corporations face an increasing competitive environment making it more challenging for corporations to assert themselves in the market. At the same time product differences shrink, which allows for consumers to face the increasing possibility of buying products from anywhere and for the best possible price. Therefore, reputation as a differentiating factor receives more and more attention (Lapointe & Cimon, 2009). For example, researchers highlighted that reputation can be used to differentiate a company from its competition, especially when corporations offer identical or commoditized products and services (Roberts & Dowling, 2002). This applies especially to EDP since its operating in a recently liberalized market, and is providing its customers mainly with a commodity product (electricity and gas).

Furthermore, having operations in several countries exposes corporations to various and partially unknown environments and risks. Also, the expansion to foreign markets not only increases the risk that subsidiaries do not act in line with the corporations standards, but also the risk of failing to meet local standards (Underhill, 2013). As a result of the globalization, supply chains are becoming more complex, spanning multiple countries thereby becoming more difficult overview; hence entail greater risk for a company's reputation.

Another reason explaining the increasing importance of reputation and its associated risk is a trend of value added in lower levels of the value-chain (e.g. through an increasing range of products and services), thereby increasing the exposure to clients. Moreover, researchers see increased client contact as a form of learning opportunities. As learning cannot be transferred or sourced, corporations are actively seeking client contact for information sharing and ideas (Osegowitsch, 2003). Recent developments in technology and its swift adaption reinforce this trend as it's becoming easier to get in touch with customers (e.g. through mobile devices and applications). This development can also be partially highlighted on the example of EDP. As outlined in the company introduction, EDP is offering an increasing range of products and services for its end consumer. Therefore, the customer interface and EDP's reputation gain in importance as consumers can directly and increasingly reward or penalize EDP for reputational events. Moreover, especially in industries in which products are commoditized and customers can switch retailers easily, customer relationships are build and maintained by increased client contact. Therefore, introducing additional products and services is an appropriate strategy but it increases the impact of reputational risk at the same time.

Finally, the importance of intangible assets increases through the need for differentiation. Driven by globalization, corporations have access to an increasing amount of markets and products. Thus, non-specialized assets are becoming available to a large base of corporations. To differentiate, companies shift to more specialized assets such as intangibles (e.g. knowledge or reputation). As already pointed out, while many competitive advantages can be copied or substituted, the advantage of intangible assets, such as reputation, is that they are difficult to imitate and are therefore increasingly used as sources for a competitive advantage (Lapointe & Cimon, 2009).

Moreover, intangible assets make up a grand proportion of a corporations market worth in today's knowledge economy. Skills of employees, innovation ability and reputation are not reflected in book values but in the market value of corporations. Therefore, governments encourage corporations to include more information about non-financial aspects in their annual report and support the development of accounting standards to disclose information about intangible assets (Rayner, 2003). Thus, it can be expected in the future that intangible assets, such as reputation, will not only be included in annual statements because it is required by law, but also will be seen as signs of good governance and transparency (CIMA, 2007). Therefore, the mitigation of risks to maintain a valuable and attractive reputation gains in importance.

Conclusions

The developments outlined above do not only constitute an increased importance for reputational risk management in itself but also contribute to an overall more sophisticated and complex market (increased competition, availability of information, expectations and demands etc.). Consequently, the value of distinct and intangible assets such as a corporation's reputation gains considerably (Tucker & Melewar, 2005). Other authors go even further and state that a corporation's reputation as becoming the single determinant of competitiveness (Haywood, 2002). This is, amongst others, because a corporation's reputation can be understood as a "collective representation" of itself. It includes past actions, its ability to deliver, and its standing with respect stakeholders (Fombrun & Riel, 1997). Thus, it reduces the increasing complexity to one single determinant.

As a result, the rationale behind an increasing relevance of reputational risk for organizations is diverse. Additionally, these developments partially reinforce each other as especially communication empowers stakeholders to broadcast any incident and gather coalition across boundaries. It has also been shown that several of these developments affect companies in general, while others affect EDP in particular, thereby underlining the importance of this business project.

Moreover, these findings can also be viewed from a different perspective. While the outlined developments highlight an increased risks exposure (e.g. higher expectations, transparency, communication, technology) on the one side, it also shows that it becomes more important to improve reputation (e.g. need for differentiation, increased market complexity, future accounting standards etc.). Based on these insights, reputational risk cannot only be seen from a downside risk perspective but also from an upside risk perspective. The latter describes the risk of failing to capture the upside. The potential upside was not considered in this particular work project but represents an interesting research topic. In a similar vein, while corporations tend to have less influence on certain of the outlined developments (e.g. higher expectations, accounting standards, technology), they do have partial influence over others (e.g. differentiation, complex supply chains, value chain shifts etc.). Hence, the degree of control over these developments differs resulting in implications for possible responses by corporations.

Finally, the analysis shows that reputational risk can hardly be viewed as detached from other organizational risks as they are interconnected and reinforcing each other. Therefore, the analysis confirms our initial definition postulating an integrated view of reputational risk.

c) Personal Experience

I learned throughout the project that my key strengths lay primarily in three areas. First, I realized that I follow a very structured and organized approach to work. Secondly, I combine this structured approach to work with a strong attention to detail resulting in high standard analyses and calculations. Finally, I would consider myself as being creative since I am always able to come up with different solutions to a problem and new ways of presenting complex content. However, during the project I also recognized that I have certain areas to work on. For example, I realized that I can think better when moving. This is, of course, not a weakness in itself but it becomes a weakness during formal meetings in which one doesn't have the opportunity to move freely. I see my verbal English skills as another area, which presents improvement potential. To eradicate this weakness, I aim to use any opportunity to practice—whether in seminars, projects or in private environment. However, I rate my written English skills as good.

d) Benefit of Hindsight

Besides the highly motivated team, a strong team spirit and sense of unity which jointly led to very favorable group dynamics and great results, the element which added the most value were the meetings with the academic and business advisor.

Although the business project team consisted of a team of four diverse students, at times a different and optimally external perspective is needed to challenge current ways of thinking. In this regard, our business advisor acted as a sparring partner clearly pointing out shortcomings and providing us with new perspectives on problems, allowing us to approach issues from a new angle. Similarly, the business advisor was highly engaged, provided access to all necessary information and therefore truly convinced us of the importance of the project to EDP. Moreover, he was demanding, constantly challenging and critically questioning the current work status. Although this might sometimes be exhausting, with the benefit of hindsight, it can undoubtedly be said that his constant challenge, his critical feedback and his high demands were crucial factors that contributed to our final results. Against this background, it can be said that not only the project results benefited from this honest collaboration, but also allowed me personally and most likely also my team members to learn new skills and gain lasting knowledge for future projects.

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