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Magnus Willesson

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New Experiences from Voluntary Risk Disclosures. Operational Risk in Nordic Banks

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Magnus Willesson
Linnæus university, School of Business and Economics, Växjö, Sweden

Abstract

Basel II simultaneously introduced a regulatory framework for operational risk and shifted the regulatory focus from top-down to bottom-up governance, prompting increased reliance on self-evaluation and market discipline. In this paper we assess the relevance of market discipline to regulation of operational risk and the implications of voluntary disclosure. We study the development, determinants and quality of operational risk disclosure in the Nordic banking sector following the implementation of Basel II. Our results reveal that the extent of disclosure has increased and that size is the main determinant. However, the quality of operational risk disclosure is poor and it does not assist stakeholders' evaluation of banks' operational risk. Based on our results, we discuss whether disclosure studies can capture quality in terms of content, the impact of regulation on banks of different sizes and whether market discipline is an effective regulatory effort to reduce bank risk.

Keywords: Operational Risk, Voluntary Disclosure, Basel II, Nordic Banks.
JEL Codes: G21; G28; G32; M48.

1 Introduction

The intention of pillar III of the Basel II accord is to narrow the information gap between principals and agents by proposing minimum requirements of mandatory disclosure for three main risk types: credit risk, market risk and operational risk. More specifically, pillar III is driven by an agency theoretical perspective (market discipline) to complement the regulation of capital requirements (pillar I) and supervisory review (pillar II) to «bolster market discipline through enhanced disclosure by banks» (BIS, 2001a, p. 5) by the assumption that «effective disclosure is essential to ensure that market participants can better understand banks' risk profiles and the adequacy of their capital positions» (BIS, 2001a, p. 5). In addition, Basel II introduces operational risk, i.e., «the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events» (BIS, 2005, p. 140), but unlike credit risk and market risk, which have extensive mandatory disclosures, the accord limits disclosures regarding operational risk to the outcome of pillar I, concerning the regulatory capital. Consequently, banks

Corresponding author: Magnus.Willesson@lnu.se, Linnæus university, School of Business and Economics, 351 95 Växjö, Sweden, Phone: +46 733-107980.

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simultaneously face a new regulatory framework, a new risk that is subject to regulatory supervision and a risk that must be voluntarily disclosed.

The few studies that examine operational risk disclosures by banks, including surveys conducted by BIS prior to the launch of Basel II (BIS, 1998; BIS, 2001b; BIS, 2002; BIS, 2003), identify a general trend of increasing disclosure (Helbok and Wagner, 2006; Linsley and Shrives, 2006; Ford *et al.*, 2009; Oliveira *et al.*, 2011a; Oliveira *et al.*, 2011b; Barakat and Hussainey, 2013). However, these studies reveal that transparency of banks' operational risks is meagre. For instance, Oliveira *et. al.* (2011b) find that the disclosure of operational risk suffers from lack of transparency, and Ford *et al.* (2009) show that disclosures regarding the management of operational risk have declined over time.

The limited literature on operational risk disclosure in banks is of a similarly small number of studies on risk disclosure. Studies of risk disclosure identify a similar trend of weak risk transparency and limited risk disclosure (e.g., Beretta and Bozzolan, 2004; Miihkinen, 2013), but there are substantial variations in risk reporting even when disclosure is mandatory (e.g., Rajgopal, 1999). Linsley and Lawrence (2007) find that risk disclosures are vague and difficult to interpret, but Lajili and Zéghal, (2005), among others, find that risk disclosure statements often vary in form and are qualitative, which makes them difficult to analyse.

From a regulatory policy perspective, it is clear that a focus on information asymmetries and agency theoretical perspectives can lead to problems of low regulatory efficiency if the opportunity costs of providing information are higher than the benefits for a bank. As noted by Fernández and González (2005), bank risk taking is negatively affected by accounting and auditing requirements, but these serve as a complement to minimum regulatory capital requirements when controlling for bank risk. Therefore, the regulatory efficiency depends on the quality of the risk disclosure.

A possibility of suboptimal disclosure levels identified by the accounting disclosure literature motivates arguments in favour of mandatory disclosures. Mandatory disclosure may enhance transparency due to the increased comparability of financial reports (Bae, Tan and Welker, 2008) or reduced information asymmetries that can affect risk premiums and the cost of capital (Dhaliwal, Spicer and Wickrey, 1979; Fishman and Hagerty, 1989; Solomon *et al.*, 2000). However, information provided in mandatory disclosures is not necessarily as effective as voluntary disclosures as a tool for corporate governance. For instance, mandatory disclosure schemes may lead to a focus on the implementation of regulations rather than a change in reporting behaviour (Ball, 2006), or market pressure can eliminate the pressure to disclose that encourages managers to conceal information in the presence of risk to maximize the flexibility of their actions and explanations. Furthermore, Dobler (2008) is sceptical of the likelihood of good risk management practices if the disclosure of information is mandatory. However, as noted by Ashcraft (2008), the impact of disclosure suggests that management may decide not to take risks that they would have taken in the absence of mandatory disclosure.

The purpose of this study is to differentiate bank characteristics with respect to disclosure quantity and disclosure quality, recognising that the effect of regulations on stakeholders is the possibility of bank discipline. We consider regulatory efficiency and target the

impact on voluntary disclosure for operational risk, which is an area where disclosure is voluntary, but regulators have an interest in thorough risk management. This implies that regulators expect banks to disclose to the benefit of stakeholders, who in turn let the market disciple the banks. By separating disclosure quantity and disclosure quality, we can analyse the extent of disclosure with respect to its goal of providing market participants with a better understanding of banks' risk profiles and the adequacy of their capital positions (BIS, 2001a, p. 5), which contributes to most other risk disclosure studies that index disclosures within content analyses. For instance, the study by Barakat and Hussainey (2013) is the only research to examine the quality of operational risk disclosures, which they emphasise based on governance variables in relation to a disclosure index.

We use a self-compiled data set from Nordic banks, a banking market that is homogenous in terms of its banking market but heterogeneous in terms of banking composition and banking strategies. In addition to providing the regional implications of the results, this data set also presents opportunity to study the voluntary operational risk quality with more contextual implications than previous studies, to study voluntary disclosures after the introduction of Basel II and to complement previous studies that target only larger banks with a greater variety of bank types (savings banks and commercial banks), characteristics (market listings among others) and sizes (local banks and international banks).

The main conclusions in this study imply that voluntary disclosure is a meagre determinant for stakeholders to evaluate operational risk. Although Basel II has affected overall operational risk disclosures, mainly determined by the bank size, the quality of disclosures is generally low.

In Section 2, we review the relatively small operational risk disclosure literature. Section 3 introduces the theoretical context of corporate disclosure in terms of motives for disclosing or not disclosing and examines the theory's empirical findings regarding firm characteristics in previous studies of disclosure. Section 4 presents the methodological approach and data collection used in this study. Section 5 presents the results of the study, targeting the quantity and quality of disclosures. Finally, Section 6 conclude with the implications of voluntary risk disclosures.

2 Operational Risk Disclosure

Until recently, general knowledge about of operational risk disclosure in banks was provided by the Basel Committee of the Bank for International Settlement (BIS). The Basel Committee conducted their first study concerning operational risk disclosure on the members of BIS in 1998, in which they «interviewed 30 major banks from different member countries on the management of operational risk» (BIS, 1998). This study was followed by three survey studies conducted between 1999 and 2001 that emphasised the disclosure of major risks in banks (BIS, 2001b; BIS, 2002; BIS, 2003). These studies considered 57 banks, 55 banks and 54 banks, respectively, and sought to provide support for the development of pillar III of the Basel II accord. In terms of operational risk, the surveys only assessed whether the banks «disclosed information about the main types of operational risk and identified and discussed any specific issues considered to be significant» (BIS,

2001b, p. 18). In other words, operational risk was included in these studies, but it was a minor dimension of the analysis. Relative to credit risk and market risk, for example, the information collected on operational risk provides no indication of the quantity or quality of information provided by banks. The results of the surveys reveal that banks increasingly reported on the types of information considered in the studies during the period analysed, from 63% of the banks in 1999 to 91% in 2001. These percentages provide an indication of the development of bank disclosures, but longitudinal comparisons are difficult because the banks studied are not entirely consistent over time, both in terms of the banks included (banks were added and removed due to changes among them, such as M&As) and the disclosure content analysed, which was not comparable over time.

Few studies other than those conducted by the BIS include operational risk disclosures. Linsley and Shrives (2006), Oliveira *et al.* (2011a) and Oliveira *et al.* (2011b) include operational risk among the risk disclosures they consider in a study of nine large UK and Canadian banks between 1999 and 2001, 111 Portuguese banks in 2006 and 190 Portuguese banks in 2006, respectively. Additionally, Helbok and Wagner (2006) study operational risk reporting in 59 large banks in 13 countries in North America, Asia and Europe between 1999 and 2001, and Ford *et al.* (2009) study the annual reports of 65 large European banks, between 2004 and 2006. The main results of these studies imply that operational risk disclosure has gained increasing attention among banks but is still not significant. Ford *et al.* (2009) are surprised that banks have not better developed operational risk disclosure strategies and that the provision of certain types of information, especially descriptions of the ways in which such risks are managed, has declined over time. The study by Oliveira *et al.* (2011b) finds that risk disclosure varies across different types of banks, while the disclosure of (voluntary) operational risk suffers from a lack of transparency, and only one bank disclosed its operational risk exposure. To our knowledge, only one study, by Barakat and Hussainey (2013), has assessed banks' operational risk after the implementation of Basel II. The aim of their study is to identify the drivers of operational risk disclosure using a disclosure index of operational risk comprised of 56 different categories (14 categories with 4 subcategories each) as a dependent variable among 243 European banks. The authors find that their disclosure index yields higher values for banks with a larger share of external directors on the board, lower levels of executive ownership, concentrated external non-governmental ownership, more active audit committees and that operate under regulations promoting bank competition. However, making our own analyses using the data they present, with respect to the extent of disclosures, the median value of the index is 13 and the highest identified value is 28 from a maximum possible score of 56, which indicates that the authors studied a sample with limited operational risk disclosures. Furthermore, they do not distinguish whether the disclosures provided benefit stakeholders, even though the quality of risk disclosure is their main focus.

3 Motivations for Voluntary Disclosure

Miihkinen's (2012) study does not include financial firms with other firms because their characteristics differ from the rest of the population. This is mainly driven by prob-

lems comparing the results, rather than different risk conclusions. However, Mathewson (1986) highlights that regulators consider the primary purpose of disclosure as providing evidence of a healthy banking system instead of revealing information to safeguard the interests of various stakeholders (for instance, depositors). This implies that regulatory efficiency is of great importance, but other than that there are similar assumptions and theoretical motives for disclosure. However, regulation may have positive or negative effects on bank risk (Leaven and Levine, 2009). For instance, excessive disclosure may reduce financial stability when there are coordination problems in the market (Rochet and Vives, 2004).

The market discipline paradigm that encompasses recent regulatory initiatives is related to *agency theory* problems and the separation of ownership and control (Jensen and Meckling, 1976). In terms of voluntary disclosures, a company elects to disclose information to reduce information asymmetries between the principal and the agent, resulting in reduced capital costs. The «market», which consists of various stakeholders, can assess a company based on more accurate information and may punish (discipline) companies that fail to disclose a significant amount of accurate information. Management will accurately report all adverse information because any suspicion that the company's information is inaccurate will lead the market to assume that the company is withholding negative information for instance in the event of a disaster (c.f. Coffee, 1984).

An extensive body of literature seeks to identify the implications of voluntary disclosure on the firm governance, stakeholders and discussions of regulatory policy and efficiency. However, there is no comprehensive theory of accounting disclosure (Verrecchia, 2001) or on disclosure as a phenomenon (Cormier *et al*., 2005). Consequently, theories provide different explanations to explain governance problems related to the disclosure of risk. One complementary motivation for banks to disclose is the *legitimacy theory*, which provides an explanation for companies' voluntary disclosure behaviour through legitimacy concerns that motivate firms to disclose voluntarily (Patten, 1991; Campbell, 2000; Oliveira *et al.*, 2011b). In other words, firms disclose information because they believe that they are expected to do so. As argued by Power (2007), regulation is generally problematic because banks will simply use the regulations to justify their reporting behaviour. Consequently, banks often follow a strategy of simply meeting regulatory requirements while failing to disclose the firm's actual risk. This implies that banks may disclose the required information and fail to provide voluntary disclosures that reflect the risks that they actually face.

In contrast to agency theory and legitimacy theory, several other theoretical frameworks attempt to explain the incentives that motivate companies not to disclose voluntarily. These incentives are primarily based on the costs involved in the disclosure process, but the theories also consider managerial incentives. Under the *discretionary disclosure theory* (also termed the proprietary theory), information is intellectual property and represents a competitive advantage for a company, which will therefore benefit from withholding information from stakeholders and competitors. These costs may be regarded as a direct cost of distributing information (Watts and Zimmerman, 1990). The revealing of differences between large and small companies primarily concern cost issues and to competitive disadvantages (Salamon and Dhaliwal, 1980). The latter is an indirect cost, which

implies that companies can benefit from withholding information from competitors (Dye, 1986) or withholding unfavourable information (Verrecchia, 1983; Dye, 1990). In terms of riskiness, Lambert *et al.* (2012) suggest that capital costs are not necessarily due to information asymmetries, but information quality that increases the precision of investors' information. It is therefore important to ensure that regulators and banks allow low-cost and centralised access to disclosed information to allow the market to use the information (Frolov, 2006).

The argument that unfavourable information is withheld may also be advanced by *signalling theories*, which explain decisions to withhold or publish information based on the signals a company does or does not wish to send to the market (c.f. Hughes, 1986). *Managerial ignorance theories* have the potential to extend signalling theories by providing explanations related to the expectations and knowledge of management. This theoretical framework explains the failure to disclose information based on managerial misperceptions of the type of information the market requires and therefore also management's awareness or understanding of the benefits of such disclosures for stakeholders (c.f. Chambers, 1984). Dobler (2008) discusses the managerial motivation to disclose further, which may vary because there is no information to disclose, the information is unverifiable, or managers withhold the information to avoid commercial disadvantages.

4 Methodological Approach

Prior research on operational risk disclosure examines either the descriptions or determinants of risk disclosure. Studies of other industries frequently suggest that voluntary disclosure may vary across companies on the basis of firm performance, profitability (negative impact), cost of capital, industry, country and governance structure (ownership, capital structure and whether the company is listed). This study examines the development of disclosure and its determinants, emphasising the theoretical implications on regulatory efficiency. In cases of meagre disclosure quality, there are often theoretical motivations based on high costs (referring to discretionary disclosure theory), signalling theory or managerial ignorance theory. None of these theories correspond to the market discipline paradigm. However, as proposed by Botosan (2004) greater attention paid to comprehensibility, relevance, reliability and comparability of disclosures is not necessarily correlated with disclosure volume. Subsequent studies document difficulties in measuring the quality of disclosures based not on the quantity of information but rather on its usefulness for stakeholders (c.f. Miihkinen, 2012).

In summary we focus our research on three questions:

1) How has operational risk disclosure developed for banks after the introduction of Basel II?

2) What are the main determinants of operational risk disclosure in banks?

3) Does the quality of operational risk disclosures correspond to market discipline and help the market judge banks' operational risks?

4.1 Sample of Banks

We study the operational risk disclosure practices of 63 banks from four Nordic countries between 2007 and 2010: Denmark (27 banks), Finland (3), Norway (21) and Sweden (12)[1]. The banks under study were selected via the BankScope database under the restriction that the banks have total assets equivalent to at least EUR 500 million[2]. Two banks were deleted due to a merger and a bankruptcy and could not be studied over the entire period. In comparison with other studies, we note that two of the selected banks (both from Sweden) are included in the BIS studies from 1999 and 2000 and at least (not all of the banks in that study are named) three (two Swedish banks and one Danish bank) are considered in the study by Ford *et al.* (2009).

The four countries' banking markets are similar with respect to consumer and investor markets, banking traditions and accounting standards, but there are variations among the banks, other than country of origin and the measurement method for operational risk that are of interest from the perspective of the study. These variations may indicate differences in regard to corporate governance that explain the differences in disclosure, although the differences in corporate governance are not explicitly measured. The study allows the opportunity to study bank size together with differences between banks with national and international operations in terms of disclosure. The countries' banking markets are partly separated and include many locally operating banks and a few banks with cross-border operations that adjust their pricing strategies to the markets in which they operate. However, the Nordic banking market has become increasingly integrated since the beginning of the 1990s, partly as a consequence of cross-country mergers. At present, the six largest banks[3] (four from Sweden, one from Denmark and one from Norway) in the region (hereafter termed the «big six») can – despite operating under their respective countries regulation and supervisory authorities - be considered «Nordic banks». Each of these banks operates in at least three of the Nordic countries and has only relatively minor interests outside of the Nordic region. These banks account for just over 90% of the aggregated total assets of all of the banks in the sample. The remaining banks are local (referred to as «local banks»), either countrywide institutions or operating in a small region within a country.

The disclosure data are self-compiled based on the banks' annual reports[4]. Banks operating under Basel II are required to disclose their compliance with the capital requirements

[1] Although Iceland is also a Nordic country, it is not included due to the reconstruction of its banking system that occurred during the period under study.

[2] The threshold for total assets was selected based on data from the end of 2009. The countries have four different currencies. Finland uses the Euro and the other countries use their country's «crown» (DKK, NKK, SEK). In the comparative tables in the study, the non-Euro currencies are converted to Euros using the nominal exchange rate at the end of each year.

[3] The six big banks are Nordea bank, Svenska Handelsbanken, Skandinaviska Enskilda banken and Swedbank (Sweden), Dnb-Nor (Norway) and Danske bank (Denmark).

[4] A bank may employ several other possible media to report operational risk, such as press releases and online and other reports from the company, but we wish to focus on the reports targeted by the Basel II regulations. In addition to the annual reports, we studied the disclosure of operational risk in the quarterly reports of the six largest banks. However, with some exceptions during the introduction of Basel II, these reports do not contain more information than the only mandatory disclosure item for quarterly reports: the regulatory capital.

for operational risk in their quarterly reports. In their annual reports, the banks are also required to disclose their measurement approach for operational risk and – for AMA banks – a description of its Advanced Measurement Approach, including an analysis of the relevant internal and external factors considered and any insurance or other risk-mitigation or risk-transfer techniques[5]. Beyond these disclosures, any other qualitative or quantitative disclosures are voluntary[6]. The disclosure data collection process is described in more detail below.

Analysing 63 banks over four years means that we studied 252 annual reports. Of these, 189 annual reports were published between 2008 and 2010, when all of the countries had implemented Basel II, which are the major attention of our study. In these reports, operational risk disclosures are presented in the form of tables and text as part of the director's report section of the annual report, added as a note to the annual report or presented as a risk report that serves as an addendum to the annual report. In the event of an operational risk disclosure in both the annual report and the risk report, some banks disclose the exact same content in both, while some present only a summary of what the other report discloses. The reports (the annual report or the risk report) that serve as the main source of the operational risk disclosure vary. We focused on the source that disclosed the most information, but we also controlled for possible complementary information. Otherwise, if both sources were used and summarised, some disclosure would be double counted.

4.2 Bank Disclosure Data

The data collection was divided into quantitative and qualitative measures of risk, focusing on the mandatory risk disclosure, the volume of accounting disclosure for risk, the content of the operational risk disclosure and the bank's risk management strategy (the Appendix displays the data collected). To perform meaningful comparisons of the content and its development over time, we developed a number of measures and coding schemes to describe and categorise the disclosures. As we know from the previously described literature, voluntary disclosure indicates that the content of the disclosure may vary with respect to quality. Furthermore, recent empirical evidence indicates that the quantitative transparency of a banking system is not related to market discipline (Semenova, 2012). Consequently, quality and quantity are not necessarily related, and banks may disclose substantial low quality information that would not benefit stakeholders and vice versa. As a result, a common methodological approach in the disclosure literature – the disclosure

[5] Finnish banks using AMA were not required to disclose insurance information until 31 December 2010. Therefore, these disclosures were not made during the study period. However, not any bank from Finland uses AMA, so the timing of this mandatory disclosure is irrelevant.

[6] The mandatory disclosures are identical in all of the countries surveyed, although the rules were implemented at different times (Denmark (BEK 10113); Finland (Föreskriftssamling, Standard 4.5); Norway (FOR 1506) and Sweden (FFFS 2007:05)). The mandatory disclosures in Basel II were introduced in all four countries at the beginning of 2007. However, Denmark and Norway had transition rules, and banks from these countries were not required to disclose operational risk until 2008. Consequently, we focus on the changes in disclosures from 2008 and start our presentation from this period in the absence of any particularly interesting findings from 2007.

Table 1: Key Ratios for Analysing the Operational Risk Disclosures by Banks

Variable	Definition	Explanation
	Quantitative Disclosure Variables	
Risk_word	Number of words describing the bank's risks and risk management. The measure includes all types of risks in the bank, including operational risk.	Measures the level of risk disclosure. The analysis reveals that the longer text for risk, the more disclosures.
Oprisk_word	Number of words describing the bank's operational risk and operational risk management.	Measures the level of operational risk disclosure. The analysis reveals that the longer text for operational risk, the more operational disclosures.
OPTOTAL	Oprisk_word/Risk_word.	Measures the relative impact of operational risk disclosed in the banks' risk reporting relative all risk reporting (including operational risk). The measure is presented in percent and the higher the ratio, the higher share of operational risk disclosure.
OPTOCAPITAL	OPTOTAL/CAPITAL	Measures the impact of operational risk disclosure in comparison to the amount of capital the banks are required to have. If OPTOCAPITAL > 1, the bank pays more attention to operational risk disclosures than the proportion of capital and if OPTOCAPITAL < 1 pays less attention to operational risk disclosure compared to other risk types.
	Qualitative Disclosure Variables	
Level 1	Disclosure about operational risks.	For instance, a bank can disclose information on what operational risk and Basel II is as well as the bank's requirement to manage these risks in accordance to Basel II.
Level 2	Disclosure associated with the practice of risk management of operational risks.	The main difference between the Level 1 and the Level 2 classification of risk management is the bank specific depth in the disclosure. Level 2 categorizes a bank's attempt to manage their risk, while Level 1 is limited to general descriptions of operational risk that could suit any bank
Level 3	Disclosure about the magnitude of operational risks in a bank.	A complete disclosure would provide the actual losses for operational risk in different business levels as well as for different risk events.

index – cannot be used because it combines and weighs qualitative and quantitative variables to rank the disclosures in a single index. High disclosure volume may compensate for low disclosure quality without providing important information to any stakeholder, implying that differences between the quality and quantity of disclosures will not be detected by a disclosure index. To avoid confusion in the analysis by combining the two, we analyse the quantity and quality of disclosure separately. In Table 1, we present and define the key variables used in our analyses. The disclosure variables are divided into quantitative variables and qualitative variables. For the quantitative disclosure measures, the main target was the number of words to describe each bank's operational risks and their management. The extent of operational risk disclosure is proxied by the number of words (Oprisk_word) to describe a bank's operational risk in the section of operational risk in the annual report. The key ratios based on the operational risk disclosure emphasise its relative importance to risk disclosure (OPTOTAL) and to the operational risk capital requirement (OPTOCAPITAL) to capture the degree to which the operational risk disclosures correspond to the actual operational risk.

We define disclosure quality based on a general benchmark for market discipline. This benchmark reflects a level of quality that should allow outsiders to assess the risks in a bank's future economic performance. (e.g., Dobler, 2005; Linsley and Shrives 2006).

Prior empirical studies provide little information relevant to this study's attempt to identify disclosure quality. Because we wish to study quality in terms of a disclosure's potential to discipline the market, we specify three levels of disclosure quality based on the transparency of the bank's operational risk and operational risk management to its stakeholders. That is, we assess whether stakeholders are able to evaluate the riskiness by analysing the content for each bank by reading the content. Level 3 indicates the most transparent disclosure, identifying the bank's operational losses, and Level 2 describes the bank's organisation of operational risk management procedures. Level 1 indicates that the bank discloses some voluntary information on operational risk, but this information has limited stakeholder value.

In this study, banks disclosing at Level 1 typically provide brief statements summarising the operational risk framework included in Basel II and defines operational risk in general – not in operational – terms. The analysis reveals that the information provided in this context is essentially standardised text that does not provide any information on the bank's operational risks or its management thereof. Furthermore, this type of disclosure does not change over time or substantially vary across banks. Banks disclosing at Level 2 report on their management of operational risk and exhibit greater variety in disclosure content than Level 1 banks. The most common disclosures are presentations concerning the bank's procedures for managing operational risk and their related responsibilities and the use of administrative systems or databases to evaluate operational risk. Three banks complement this content with information that they are using an external database (ORX). Nevertheless, Level 2 banks define operational risk in line with the general formulation in Basel II and not in terms of their own risks. Some of the banks disclose their goals and targets for the management of operational risk or certain risk types that they emphasised in their risk control efforts during the year. Such information may also be supplemented by more general statements on the bank's operational risk profile and the bank's overall risk management efforts and procedures, for instance descriptions of the work of the risk committee. In Level 3 disclosures, banks publish information regarding their actual operational risks or losses (total losses and/or number of events) in aggregate or by business line. In the simplest version of operational risk disclosure in our data, banks report that operational risk was the bank's second largest risk and whether the impact of operational risk was above or below normal for the year. Details on the magnitude of operational risk are presented by some of the larger banks, but stakeholders have little opportunity to assess the operational risk, implying that there is room for a fourth level.

4.3 Bank Characteristics Data

The variables used to characterise the banks are derived from previous empirical and theoretical discussions but are adjusted to apply to the particular quantitative and quali-

tative characteristics of Nordic banks and to operational risk (Table 2). The quantitative categorical variables are associated with the banks' leverage and profitability. We use two different measures to assess the impact of leverage and expect banks with higher capital risk to disclose more in accordance with agency and signalling theories. The SOLIDITY measure is a classical measure of leverage, measured as the book value of equity relative to total assets. In addition, we include a risk-adjusted measure of capital, the Own Funds Ratio (OFR), which measures a bank's economic capital (own funds) relative to its capital requirement. We relate another measure to these two: the CAPITAL measure, which accounts for the importance of operational risk relative to other types of risk and measures whether the disclosure of operational risk is related to the bank's capital requirement for all risks. The measure solely focuses on the relative importance of operational risks in comparison with risks. We control the results for the banks' returns, which are measured by the commonly employed accounting measures Return on Equity (ROE) and Return on Assets (ROA).

The literature suggests that size is an important factor in examining accounting disclosures and its measurement can benefit all of the theories. However, when comparing banks, it is important to recall that the volume of total assets substantially affects a bank's riskiness[7]. We also control our results for the big six and local banks because of the substantial size difference between these two groups. Other control variables are ownership, stock market listing status and risk management processes, which are used as proxies for banks' governance mechanisms. An ownership variable is difficult to include because many savings banks have no owners. Instead we assess the implications of ownership by distinguishing between savings banks and commercial banks (Bank_type), and in addition, we divide the banks into listed and non-listed banks. The latter categorisation is further intended to capture access to capital and to account for possible differences in owners' expectations regarding operational risk disclosures, which we expect to be higher for listed companies, in line with the agency and signalling theories. Finally, we categorise the banks based on the measurement approach used for operational risk capital requirements. The measurement approach extends the scope applied in prior studies because we know that the regulator's intention is to reward banks with a more Advanced Measurement Approach (AMA), which also could affect operational risk disclosures. This measure is also suitable as a proxy for the sophistication of the internal risk modelling the bank uses and consequently the sophistication of the banks' risk management processes. However, because there is only one bank using AMA in the sample of banks under study, we emphasise differences between SA and BIA. We also use this measure as a control to ensure that a bank's measurement approach does not drive the results in other quantitative or qualitative categories. Finally, and not presented in the table, we control all of the results for country effects.

[7] We control for size based on the equity capital requirement, which implicitly – in accordance with Basel II – adjusts the assets for their riskiness. This variable does not significantly determine either of the two dependent variables.

Table 2: Variables Controlling for Bank Characteristics

Variable		Definition	Explanation
		Quantitative characterising variables	
OFR		Own Funds Ratio: Own Funds/Capital requirement	Measures the bank's capital to the required capital estimated by credit risk, market risk and operational risk. The measure must be over one to comply with the Basel II regulation.
CAPITAL		Capital requirement for operational risk/ Total capital requirement	Measures the relative impact of operational risk to the banks' total capital requirement.
SOLIDITY		Equity/Total assets (book values)	The solidity of a bank. The higher the ratio
DEBTCOST		Interest expenses/average total debt	The average cost of debt for a bank in a year.
Profitability	ROA	Net income (after credit losses)/average book value of Total Assets	Profitability measure measured from the firm perspective.
	ROE	Profit before taxes/book value of Equity.	Profitability measure measured from the owner's perspective.
Bank_size		Log of average total assets (1000 EUR)	The higher the value, the larger the bank in terms of total assets.
		Qualitative characterising variables	
Big_six		Big six or Local	Big six are the sig largest banks, defined according to their international (Nordic) organization. Other banks, named local operate mainly in one country.
Bank_type		Savings bank or Commercial bank	Savings banks have multiple goals often related to the nearby society, where the main aim is not necessarily related to the return. Commercial banks have ownership related goals.
Method		AMA = Advanced Measurement Approach SA = Standardized Approach BIA = Basic Indicator Approach	Measurement Approach for the bank's operational risk capital requirement
Listing		Listed or non-listed	Listed on a stock exchange or not, which refer to the differences in information disclosure and also relates to the possibility of accessing capital on the market.

5 Results

The descriptive statistics of the variables are presented in Table 3. The table reveals that Basel II has encouraged the disclosure of operational risk. All of the banks studied disclosed some information on operational risk in 2010, and the average quantity of operational risk disclosure increased over time. The average number of words used to disclose operational risk was 300 in 2010, which represented a 15.8% increase during the period of study. Prior studies indicate that few large banks disclosed information prior to Basel II so Basel II had a substantial impact on the degree of operational risk disclosure. In addition to the table, all but three banks satisfied the mandatory disclosure requirements in 2010 (one bank did not publish its measurement approach and two banks failed to disclose their levels of required operational risk capital), compared with ten banks in 2008[8].

[8] To expand on the figures reported in Table 3, we observe that Swedish banks exhibited both the highest average volume (409 words) and the highest growth (33%) in operational risk disclosure during the period studied, followed by Finnish banks. Unlike general risk disclosures, we cannot identify any 'catching up' with respect to the operational

Table 3: Descriptive Statistics of Disclosure and the Characterising Variables

Variable		Mean (or number of banks) 2010	Standard deviation of mean 2010	% change in mean (or number) 2008-2010
Quantitative Disclosure Variables				
Risk_word		4,465 words	5,441	23.9%
Oprisk_word		300 words	286	15.8%
OPTOTAL		10.4%	0.08	7.9%
OPTOCAPITAL		1.43 (n = 61)	1.50	–2.0%
Qualitative Disclosure Variables				
Level 1		63 banks	–	+3.2%
Level 2		35 banks	–	+6.1%
Level 3		5 banks	–	+66.7%
Quantitative Characterising Variables				
OFR		2.00	0.85	12.4%
CAPITAL		9.0% (n = 61)	0.06	16.9%
SOLIDITY		8.7%	0.04	–5.4%
DEBTCOST		1.7%	0.009	–58.5%
Profitability	ROA	0,50%	0.009	–
	ROE	6.2%	0.154	1140%
Bank_size		14.9	1.79	+1.5%
Qualitative Characterising variables				
Big_six	BIG_SIX	6 banks	–	–
	Local	57 banks	–	–
Bank_type	Savings banks	33 banks	–	–
	Commercial banks	30 banks	–	–
Method	AMA	1 bank	–	–
	SA	11 banks	–	–
	BIA	48 banks	–	–
Listing	Listed	34 banks	–	–
	Non-listed	29 banks	–	–

On average, the operational risk disclosures increased during the study period and – regardless whether risk disclosure increased more in percentage terms – gained on the total risk disclosures as the OPTOTAL ratio increased between 2008 and 2010. The OPTOCAPITAL ratio was on average above 1, which indicates that operational risk disclosures took up more room in the annual reports than its proportion of risk relative other risks.

Table 3 furthermore displays the number of banks that fulfilled the criteria for the three quality disclosure levels (in the following regressions, the levels are classified as dummy variables according to its highest level, i.e. Level 3 five banks, Level 2 30 banks and Level 1 28 banks). A bank may, but not necessarily, disclose on all three levels at the same time. The quality of disclosures, in terms of usefulness to stakeholders, was weak. In 2010, only five banks, an increase by two banks from 2008, disclosed information

risk disclosures of banks in countries where Basel II was implemented one year later. We also observe that the big six disclosed operational risk at four times the volume of local banks, which substantially affect the differences between the four countries. After controlling for the effect of the big six, the differences across countries evened out, except for Finland, where the local banks disclosed at nearly twice the volume of local banks in the other countries. Complementary analyses of the differences (t-tests) between countries (one by one) imply that the only country-related differences among the variables, whether including big six or not, are for Norway and Finland for the OPTOTAL measure in 2008. The banks' capitalisation and cost of capital varied among the countries, although there is no consistency in the results over time.

Table 4: Average Values and Tests for Mean Differences between the Disclosure and Characteristics Variables, 2010

Variable		Total	Size		Bank type		Method		Listing	
			Big 6	Local	Commercial banks	Savings banks	BIA	SA	Listed	Non-listed
Measure	Number of banks	63	6	57	30	33	48	11	34	29
Risk_word	mean	4,465	17,318	3,112	6,475	2,638	2,843	11,896	6,379	2,221
	t-test		***		***		***		***	
Oprisk_word	mean	300	834	243	406	202	231	639	372	214
	t-test		***		***		***		**	
OPTOTAL	mean	10.4%	4.74%	11.0%	11.3%	9.6%	11.4%	7.1%	9.4%	11.6%
	t-test		*		–		–		–	
OPTOCAPITAL	mean	1.43	0.71	1.51	1.25	1.60	1.52	1.11	1.13	1.81
			(n = 55)		(n = 30)		(n = 47)		(n = 27)	
	t-test		–		–		–		*	
Bank_size	mean	14.9	19.5	14.4	15.6	14.2	14.2	17.5	15.5	14.2
	t-test		***		***		***		***	
OFR	mean	2.0	1.59	2.04	1.85	2.14	1.97	1.63	1.87	2.15
	t-test		–		–		**		–	
CAPITAL	mean	9.0%	6.7%	9.2%	10.9%	7.1%	9.6%	7.1%	9.2%	8.7%
			(n = 55)		(n = 31)		(n = 47)		(n = 27)	
	t-test		–		***		–		–	
SOLIDITY	mean	8.7%	4.4%	9.1%	7.1%	10.1%	9.0%	6.6%	6.9%	10.8%
	t-test		***		***		*		***	
DEBTCOST	mean	1.7%	1.4%	1.8%	1.4%	2.0%	1,8%	1.3%	1.8%	1.7%
	t-test		–		**		*		–	
ROA	mean	0.4%	0.4%	0.4%	0.2%	0.5%	0.3	0.4	0.3	0.4
	t-test		–		–		–		–	
ROE	mean	6.2%	13.0%	5.5%	4.6%	7.7%	5.0%	9.3%	6.6%	5.7%
	t-test		–		–		–		–	

Note: *t-tests* results of group mean difference is denoted by «*» where the test is significant at the 10% level, «**» is significant at the 5% level and «***» is significant at the 1% level. «–» is not significant.
Two banks are not disclosing their mandatory capital requirement for 2010, which leads to two missing values when constructing the CAPITAL and OPTOCAPITAL ratios.

categorised as Level 3 which provide stakeholders some useful information regarding a bank's operational risk. These banks presented losses due to operational risk as figures, diagrams or hard numbers. Normally, the content of the operational risk disclosures was standardised, and the quality of the voluntary operational risk disclosures was poor, implying that banks face little pressure to improve market discipline.

Table 4 presents a summary for the qualitative bank characteristics variables and the t-tests of equal means (the results are controlled by Mann-Whitney U-test). We observe that the volumes (Oprisk_word) differ across all of the characteristics variables, which implies that size, bank type, risk management and market listing can be used to describe disclosures and that we have valid controls for operational risk disclosures. The operational risk ratios do not provide much information regarding the relative importance of operational risk. There is only a weak difference between the big six and local banks regarding the proportion of operational risk disclosures (OPTOTAL), which implies that the larger banks disclosed proportionally less. The ratio to operational risk capital (OPTOCAPITAL) is only statistically significant for listed companies: the listed companies disclosed proportionally less (the OPTOCAPITAL is significantly different at the 10% level in the Mann-Whitney test of difference between big six and local banks and between Commercial banks and Savings banks). There are some anomalous results when

2008 and 2009 are analysed. The significance according to bank size for the OPTOTAL is not significant in 2008 but is significant (10% level) for 2009 for market listing. The OPTOCAPITAL is significant in terms of market listing only for 2009 and 2010 at the 10% level.

In addition to Table 4, ANOVA tests of the disclosure and control variables with respect to the three levels of quality yield significant results for all of the variables except for the cost of capital (DEBTCOST) measure, which is a common argument in favour of market discipline. The general results reveal that there are differences in both bank characteristics and disclosures between banks, depending on the quality differences, and banks with higher quality disclosures disclose more in terms of volume (quantity). For the OPTOTAL and OPTOCAPITAL ratios, the higher quality disclosing banks disclose less regarding operational risk. However, it is worth notice that there is no significance in the operational risk disclosure volume between Level 2 and Level 3 banks. The relationship between disclosure volume and quality is further proven problematic when analysing the proportion of operational risk (OPTOTAL), where the relationship is higher for Level 2 compared with Level 1 but is lower for Level 3 than for both of the other levels. The latter is not a surprise because the number of words to describe risk is proportionally higher for the banks that disclose higher quality information, but the Level 2 banks' ratio should have been lower than the Level 1 banks' ratio if the link between quality and disclosure volume can be justified without any reservations. (The difference in the OPTOTAL ratio is not significant between Level 1 and Level 2). Similar results of insignificant differences between Level 1 and Level 2 are found for OPTOCAPITAL, OFR and CAPITAL.

The following analysis attempts to identify the primary effect of operational risk disclosure using the volume of disclosure and the relative effect of disclosure as dependent variables in random effects regressions using panel data for the period between 2008 and 2010. We include all of our quantitative and qualitative categorical variables, but we employ alternate variables to address collinearity and tp consider measures of similar characteristics[9]. The presentation of the results focuses on six regressions for each dependent variable. The first four tests examine a variety of quantitative and qualitative characteristics, and the latter two also consider disclosure quality levels as dummy variables. Controlling for the levels of quality, complementary regressions are estimated separately for banks providing lower quality and higher quality disclosure.

[9] For example, we considered a variety of profit measures (ROA before and after taxes, ROE before and after taxes and other variables that contribute to these return measures) and capitalisation measures (OFR and SOLIDITY). We present the regressions with the highest t-values obtained from a comparison of these measures (none of the profitability measures represent significant determinants of operational risk disclosure). We do not include collinear variables in the same regression. We concentrate on our operational risk measures and obtain a positive correlation with size and the relative capital requirement for operational risk but a negative correlation with the regulatory and economic capital measures OFR and SOLIDITY. The remaining variables are not significant to operational risk disclosure. Our relative measure of operational risk disclosure, OPTOTAL, is positively correlated with the relative capital requirement for operational risk, CAPITAL, but negatively correlated with size. These results imply that size affects operational risk disclosure, but it has a larger effect on overall risk disclosure than on operational risk disclosure. Consequently, operational risk disclosure is relatively less important for large banks. However, operational risk disclosure seems correlated with the relative importance of the operational risk capital requirement, but there is a negative relationship between operational risk and both SOLIDITY and OFR. This result implies that banks with larger capital reserves – in terms of equity or own funds – disclose less.

Table 5: Random Effect Regression Results, Operational Risk Words

	(1) Oprisk_word	(2) Oprisk_word	(3) Oprisk_word	(4) Oprisk_word	(5) Oprisk_word	(6) Oprisk_word
Bank_size	100.691***	100.171***	90.251***	78.559***	85.205***	68.141***
DEBTCOST	–	−1637.768	–	–	–	–
ProfitabilityROE	–	−149.277	–	–	–	−108.903
SOLIDITY	–	–	−894.595*	−952.809*	−674.750	−743.060
Method AMA	–	–	–	−250.179	–	−268.316
Method SA	–	–	–	202.756**	–	187.646*
Method BIA	–	–	–	96.107	–	63.118
Bank_type	–	–	–	−65.369	–	−65.761
Unlisted	–	–	–	42.792	–	39.035
LEVEL 1	–	–	–	–	168.354	162.813
LEVEL 2	–	–	–	–	260.554*	260.351*
LEVEL 3	–	–	–	–	225.936	265.737*
Constant	−1205.973***	−1149.292***	−972.528***	−883.332***	−1131.480***	−928.829***
N	188	188	188	188	188	188
R^2	0.423	0.432	0.439	0.505	0.471	0.539
P	0.000	0.000	0.000	0.000	0.000	0.000

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The descriptive statistics indicate that the volume of disclosure has little effect on stakeholder benefits. In Table 5, we present the results of the six random effect regressions using the volume of operational risk disclosure (Oprisk_word) as the dependent variable. The results reveal that size alone determines over 40% of the operational risk disclosure quantity (these results are also robust when controlling for year, the big six and country (not shown)). Further study reveals that leverage (SOLIDITY) is negatively related to the volume of operational risk disclosure, which is consistent with the general understanding of disclosure that banks with higher leverage disclose more. However, this relationship disappears when controlling for quality variables. We also consider the cost of debt (DEBT) and the profitability measures (also controlled for the years of the financial crisis because, for example, average ROA was negative in 2008), but these variables are not significant. Prior studies report that the cost of debt and profitability predict disclosure. Regarding disclosure quality, we obtain effects similar to those observed regarding disclosure quantity and find that volume and quality are linked. However, this relationship is only present among Level 1 and Level 2 banks and not for those in the higher quality category, which is confirmed by additional tests (not reported) using logit regressions with the quality categories as dependent variables (using a «low quality» group containing banks disclosing at Level 1 and a «high quality» group containing the remaining banks disclosing at Level 2 and Level 3 altogether. Additional testing also separates Level 2 and Level 3 banks). The results of these tests (as well as the results from the study of mean differences) reveal that it is likely that more sophisticated and higher quality disclosures require additional space to report, though quantity is no guarantee that stakeholder interests are considered in the disclosures.

Given these results, we separate the sample into two groups based on disclosure quality. We find that, relative to the overall regressions presented in Table 5, in the low-quality group of banks, size has no effect on disclosure, the SOLIDITY measure has a negative sign and being listed on an exchange has a positive effect. More interestingly, we find that the cost of capital (DEBTCOST) is negatively related to disclosure quantity in the high quality group. Although these results are not as robust when controlling for other

Table 6: Random Effects Regression Results, OPTOCAPITAL

	(1) OPTOCAPITAL	(2) OPTOCAPITAL	(3) OPTOCAPITAL	(4) OPTOCAPITAL	(5) OPTOCAPITAL	(6) OPTOCAPITAL
Bank_size	−0.127	−0.102	−0.254***	−0.293**	−0.244**	−0.316*
DEBTCOST	–	21.744*	–	14,072	–	
Profitability						
ROE	–	0.279	–	–	–	−0.451
SOLIDITY	–	–	−11.550***	−14.452***	−11.399**	−15.648***
Method AMA	–	–	–	0.480	–	0.466
Method SA	–	–	–	0.460	–	0.363
Method BIA	–	–	–	−0.237	–	−0.378
Bank type	–	–	–	−0.056	–	0.119
Unlisted	–	–	–	0.907***	–	0.808**
LEVEL 1	–	–	–	–	0.141	0.066
LEVEL 2	–	–	–	–	0.264	0.199
LEVEL 3	–	–	–	–	0.000	0.000
Constant	3.315***	2.347*	6.153***	6.312***	5.809***	7.096**
N	172	172	172	172	172	172
R^2	0.021	0.058	0.083	0.176	0.085	0.168
P	0.056	0.016	0.000	0.000	0.004	0.000

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

variables (Method, Bank_type and Listing), they provide an interesting contrast in which a lower cost of debt leads to increased disclosure by banks in this category. The result is as expected, but it indicates that lower quality banks are not affected in this respect, and that our theoretical framework does not apply to banks with low disclosure quality.

In targeting the relative importance of operational risk disclosures (OPTOCAPITAL) and the determinants for disclosing operational risk, the results are determined less by our bank characteristics than for the operational risk disclosure (Table 6). The measure is affected negatively by SOLIDITY and Listing, which means more operational disclosure proportional to operational risk is relatively less important for banks with lower solidity and banks not listed on an exchange. These results suggest information asymmetries and signalling. Furthermore, Size has a negative effect on the relative importance of disclosure to risk, but only when jointly regressed with leverage. Furthermore, the analyses separately considering the higher and lower quality categories (not reported in any Table) reveal significant and negative results for banks with lower disclosure quality for DEBTCOST, in contrast to the positive relationship for higher quality banks regarding disclosure volume. Disclosure quality does not determine the relative importance of operational risk disclosures. All Results are robust when controlling for year, the big six and country (not shown).

6 Conclusions

This study on large and small banks in the Nordic countries after the introduction of Basel II focuses on the regulatory efficiency aspect of voluntary disclosures to determine whether regulators can rely on stakeholders to discipline banks. Using a data set examining a newly regulated operational risk and the proposed disclosure initiatives in pillar III, the purpose of this study is to analyse the development of operational risk disclosures and the differences in operational risk disclosures with respect to bank characteristics and operational risk disclosure quality.

The results reveal that Basel II encouraged the disclosure of operational risk, as both small and large banks provide disclosures voluntarily on the topic of operational risk. Size is the biggest determinant of disclosure, which can relate to either of the cost aspects of discretionary disclosure theory. Cost aspects can be argued to be an opportunity cost for banks in agency theory as well, but the sophistication of the risk management process does not add to the determination of operational risk disclosures. However, the sophistication of risk management regarding risk and disclosure requires additional attention because only one bank in this study measures its capital requirements by the AMA. Furthermore, we have had difficulty finding good explanations for the importance of operational risk disclosures relative to operational risk, which is mainly affected by a bank's leverage and market listing, although there are – in terms of information asymmetries and signalling – indicative results that captital risk and market listing has effect.

The quality of operational risk disclosure is poor, implying that banks face little pressure to disclose information that would be valuable to stakeholders. Consequently, it is difficult to determine high quality, but we can find some relationship in terms of all of the variables except for the cost of capital. The latter implies that one major argument for market discipline is not shown to be a determinant of disclosure.

Our results are limited to Nordic banks, but the results are not surprising compared with the previous literature on operational risk disclosure and there is a possibility to find same results in other countries. However, we identify two important considerations for further study. First, there is a need to develop additional approaches to identify and focus on firms' disclosure quality and transparency, especially to analyse higher quality disclosures. Because a unitary disclosure index combines volume and quality data, studies using such an index are unable to distinguish high quality disclosures from low quality, high volume disclosure data that provide little benefit for stakeholders or reductions of information asymmetries. Second, the importance of bank size may lead to misleading results (both in finding determinants and for regulatory purposes) if a broader set of banks, including smaller banks, is not included.

The results of increased disclosure after the introduction of Basel II, which demonstrate a low value for stakeholders, imply that legitimacy theory is one driving factor in operational risk disclosures, whereas the agency theoretical perspective of market discipline does not explain operational disclosure as well because the poor quality of such disclosures renders them unable to reduce information asymmetries. These results are particularly interesting with respect to the regulation of smaller banks because of the size effect that we observed. Moreover, size also has little effect on the quality of bank disclosures.

From a regulatory policy standpoint, our results cast doubt on the validity of a regulatory framework that solely attempts to modify bank behaviour based on market discipline. However, our inability to explain the effect of bank risk on operational risk disclosures demonstrates that substantially more research is needed before regulatory action should be taken. In terms of the disclosure of operational risk, further studies are required to examine reasons for the low quality of disclosures. For instance, risk management processes differ between banks, which should result in more detailed disclosures by banks that use

more sophisticated methods to determine their capital requirements because they know more about their operational risks. Withholding information can be explained in terms of signalling theory (banks do not want to signal bad news when their operational risk is high), discretionary disclosure theory (banks withhold information that has value) or managerial ignorance theory (banks withhold information because of a managerial misperception that that stakeholders will benefit).

Appendix: Disclosure variables collected from annual reports

Information category	Disclosed information collected	
Mandatory disclosures	Capital requirement operational risk*	Operational risk requirement method (BIA, SA, AMA)*
	Total capital requirement	
	Total capital base	Use of Insurance* (AMA only)
Accounting disclosures	Separate Risk report	Number of risk words
	Annual report pages	Number of operational risk words
	Risk report pages	Number of words on the development of operational risk
	Operational risk report pages	
Operational risk disclosures	Operational risk definition	Operational risk organization
	Operational risk events	Operational risk level
	Operational risk losses	Operational risk level in comparison to
	Operational risk reporting system	Use of the ORX-database
	Operational risk per business line	Operational risk goals
		Focus on Risk Management
Risk Management Strategy	Risk tolerance	Risk Management organization
	Risk strategy	Number of annual risk reports
	Risk structure	Compliance
	Risk committee	Responsibility
	Number of risk committee meetings	

* Variables marked by «*» refer to those that are mandatory disclosure for operational risk.

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