RISK DISCLOSURES, GOVERNANCE AND OWNERSHIP: EVIDENCE FROM GERMAN NON-LISTED FIRMS

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Abstract

This paper is the first to investigate risk disclosures by German non-listed firms in relation to key attributes of governance and ownership. Based on manual content analysis of risk disclosures by 100 firms in the manufacturing sector we employ univariate tests and multivariate regressions to examine the characteristics and determinants of risk disclosures, respectively. Results suggest that non-listed firms provide fewer risk disclosures but follow similar patterns in respect to the composition of risk disclosures as compared to prior evidence on German listed firms. Consistent with agency theory, the volume of risk disclosures is positively associated with the existence and size of a supervisory board and the use of a Big-4 auditor while negatively associated with concentrated ownership in subsidiaries or family firms. Our findings contribute to limited evidence on risk and discretionary disclosures by non-listed firms.

Keywords: Concentrated Ownership, Corporate Governance, Financial Reporting, Germany, Non-listed Firms, Private Firms, Risk Disclosures.

1. INTRODUCTION

In recent years and triggered by the financial and economic crisis, corporate risk disclosures have significantly gained interest in regulation, practice, and research beyond financial sectors around the world (Lajili et al., 2012; Ntim et al., 2013). Risk disclosures shall reduce the information asymmetry between managers and stakeholders by providing information on the risks a firm faces and on the way risks are managed (Jorgensen and Kirschenheiter, 2003; Linsley and Shrives, 2006). Notwithstanding increased disclosure regulation at national and international levels, risk disclosures are largely discretionary and dependent on disclosure incentives (Dobler, 2008; Elshandidy et al., 2018).

Despite the multifaceted body of empirical research on risk disclosures that has emerged over more than two decades (Ryan, 2012; Buckby et al., 2015; Khlif and Hussainey, 2016; Elshandidy et al., 2018), evidence on risk disclosures by non-listed firms remains very scarce and limited. Studies that include or focus on non-listed firms almost exclusively address firms in financial sectors that are subject to particular risks, disclosure requirements, and regulatory oversight (Willesson, 2014; Aryani and Hussainey, 2017; as a notable exception Oliveira et al.,

2011). Potential reasons for the paucity of evidence on risk disclosures by non-listed firms in non-financial sectors include the regulators' focus on risk disclosures by listed firms and in financial sectors, the researchers' limited access to corporate reports and data of non-listed firms, and simply few risk disclosures expected in corporate reports of such firms.

Non-listed firms are known to differ substantially from listed ones in many respects. Accounting research indicates that these differences affect firms' reporting and disclosure practices, even within a national setting (Burgstahler et al., 2006; Bradshaw et al., 2014). Since the majority of firms in virtually all countries, including Germany, are non-listed, lack of evidence on such firms is a major gap in risk disclosure research. Our paper addresses this gap.

This paper investigates (1) the volume and composition of risk disclosures, and (2) key governance and ownership determinants of the volume of risk disclosures. It draws on risk disclosures in management reports in 2010 of 100 non-listed firms in the manufacturing sector headquartered in Germany. The German setting is well suited because risk disclosure requirements imposed by the German Commercial Code (GCC –

Handelsgesetzbuch) and the private German Accounting Standard (GAS) cover large non-listed firms. By referring to the year 2010, we avoid potential impacts during the financial and economic crisis and address the year in which the latest amendments to GAS 5 Risk Reporting were first effective. Selecting the manufacturing sector covers a key non-financial sector that can be assumed to face a broad set of risks (Dobler et al., 2011; Bravo, 2018).

Key results suggest that the volume of risk disclosures of non-listed firms is lower than the volume observed in prior studies on listed firms in Germany while the composition of risk disclosures seems to follows similar patterns. Sample firms tend to report on risk sources and risk management in a rather balanced way, provide very few quantitative risk disclosures, and disclose significantly more on non-financial rather than financial types of risk. The volume of risk disclosures is positively associated with the existence and size of a supervisory board and the use of a Big-4 auditor and negatively associated with a firm's status as a subsidiary and a family firm. These findings are consistent with agency theory. They indicate that attributes of governance and ownership play a significant role in determining risk disclosures by non-listed firms.

This paper contributes to the scarce evidence on comprehensive risk disclosures of non-listed firms in non-financial sectors. To the best of our knowledge, this is the first paper that provides evidence on risk disclosures by non-listed manufacturing firms in Germany that goes beyond descriptive statistics (Montag, 2015). Our paper further contributes to research on governance and ownership determinants of corporate disclosures of non-listed firms by exploiting a setting that offers substantial room for discretion despite advanced regulations in place.

The remainder of the paper proceeds as follows: Section 2 provides background on conceptual issues, regulation in Germany, and prior empirical evidence. Sections 3 and 4 present the hypotheses and the research method, respectively. In Section 5, we report and discuss the empirical results. Section 6 offers conclusions.

2. BACKGROUND

2.1. Risk disclosures, regulation, and discretion

Risk disclosures can be seen as a particular, largely narrative component of the corporate disclosure package that typically supplements information provided in financial statements (Beretta and Bozzolan, 2004; Abraham and Shrives, 2014). With Linsley and Shrives (2006, p. 389), this study refers to risk disclosures "if the reader is informed of any opportunity or prospect, or of any hazard, danger, harm, threat or exposure, that has already impacted upon the company or may impact upon the company in the future or of the management of any such opportunity, prospect, hazard, harm, threat or exposure." This broad definition covers various types of risk disclosures and is widely accepted in the field (Amran et al., 2008; Mokhtar and Mellett, 2013; Zhang et al., 2013; Cordazzo et al., 2017).

Referring to agency theory, risk disclosures shall reduce the information asymmetry between a firm's managers and stakeholders that lack access to private information channels (Jorgensen and Kirschenheiter, 2003; Linsley and Shrives, 2006). Based on the

economics of information, however, Dobler (2008) concludes that risk disclosures are inherently subject to substantial discretion because risk-related information is partly subjective and non-verifiable. Managerial discretion in providing risk disclosures, thus, can only partly be limited by regulations while disclosure incentives play a substantial role in determining risk disclosures whatever regulatory approaches are imposed (Dobler et al., 2011; Dobler et al., 2016).

While regulators have been increasingly made aware of various types of risk disclosures desired by firm stakeholders, risk disclosure regulations to date typically seem to focus on financial types of risk and related risk management. Apart from this focus, risk disclosure requirements still concentrate on specific types of disclosures, are quite general in nature, or even absent (ICAEW Financial Reporting Faculty, 2011; Miihkinen, 2012; Maingot et al., 2013; Cordazzo et al., 2017). Acknowledging the properties inherent to risk disclosures, risk disclosure regulations leave extant room for managerial discretion particularly with regard to non-financial types of risk (Dobler et al., 2011; Campbell et al., 2014).

Discretionary disclosure theory offers a framework to assess how managers exercise discretion in providing risk disclosures (Verrecchia, 2001; Jorgensen and Kirschenheiter, 2003). Based on a review of analytical studies, Dobler (2008) concludes that disclosure costs, uncertain information endowment, and issues of credibility can limit corporate incentives to provide risk disclosures. This assessment coincides with key factors explaining deficient risk disclosures as stated by Kravet and Muslu (2013), i.e., the partly proprietary nature, the unfavourable notion, and the uncertain quality of a firm's risk assessments.

Against this background, a firm's risk disclosures are a function of firm-level incentives and institutional arrangements at the country-level. This study exploits the German setting.

2.2. Regulatory setting in Germany

German risk disclosure requirements have been assigned a forerunner role, internationally (IASB, 2005; Homölle, 2009; ICAEW Financial Reporting Faculty, 2011; Brown et al., 2014). This assessment is due to long-standing legal disclosure requirements and the existence of GAS 5 as a private standard on comprehensive risk disclosures in management reports.

As early as 1998, the GCC explicitly mandated disclosures on downside risks that likely impact on the entity's future development (Sec. 289 (1), 315 (1) GCC). This broad requirement on 'risk reporting' preceded similar requirements at the EU-level imposed by the Modernization Directive 2003/51/EC. Legal requirements on risk disclosures in management reports have been enhanced in 2004 (Dobler, 2005; IASB, 2005). Maintaining a broad perspective, firms' shall assess and discuss the significant risks and opportunities in relation to the entity's expected development (Sec. 289 (1), 315 (1) GCC). Focusing on financial types of risk, firms shall address exposure to price risk, credit risk, liquidity risk, and cash flow risk as well as related risk management associated with financial instruments deployed (Sec. 289 (2) No. 2, 315 (2) No. 2 GCC). In subsequent years, the legal requirements on risk

disclosures in management reports have been amended and supplemented by specific disclosure requirements for listed firms.

In 2001, the German private accounting standard-setter issued GAS 5 Risk Reporting to specify the broad legal risk reporting requirement. GAS 5 was the first standard with comprehensive risk disclosure requirements, internationally (Dobler, 2005; Homölle, 2009). The standard focuses on downside risk and requires disclosures about risks that could affect the decisions of users of the management report. Disclosures shall describe risks classified into risk categories, and assess their possible consequences based on the probability of occurrence and potential damage. Quantitative risk disclosures are only required under specific circumstances. Disclosures shall focus on the specific circumstances a firm face, highlight risk concentrations, and describe corporate risk management. GAS 5 has been amended several times; final amendments were effective in 2010. In 2012, GAS 20 superseded GAS 5[1].

While statutory enforcement in Germany focuses on listed firms (Hitz et al., 2012) non-listed firms' compliance with risk disclosure requirements mainly relies on two key elements of corporate governance: the supervisory board and the auditor (Freidank et al., 2011; Haller and Wehrfritz, 2011). The supervisory board is a compulsory element in the corporate governance of German stock corporations (Aktiengesellschaften) and cooperatives. Other limited companies and Societates Europaeae are required to have supervisory boards only under certain circumstances. In Germany's two-tier board system, the supervisory board advises the management board and serves as a control and monitoring mechanism (Leuz and Wüstemann, 2004; von Werder and Talaulicar, 2011). The supervisory board, assisted by an external auditor, has to audit financial statements and management reports, including risk disclosures, and to provide a report on the results of its own and the external auditor's assessments (e.g., Sec. 171 (1) and (2) German Stock Corporation Act (Aktiengesetz)).

Non-listed firms and groups of a certain size are required to have their financial statements and management reports audited by an independent external auditor (Sec. 316 (1) and (2) GCC). The GCC puts particular emphasis on the audit of risk disclosures in the management report (Dobler, 2004; Velte, 2014). It emphasizes the auditor's responsibility to assess whether opportunities and risks are accurately presented and requires the auditor to explicitly state the result of this assessment in the audit opinion (Sec. 317 (2) and 322 (6) GCC).

In summary, risk disclosures of non-listed German firms are highly regulated and subject to audit by the supervisory board and statutory auditor. Beside these governance features, private control mechanism imposed by ownership structures, such as family ownership, are prevalent in the German setting (Niefert et al., 2009; Weissenberger-Eibl and Spieht, 2009). Our paper exploits this interesting

setting to provide novel evidence on risk disclosures by non-listed firms.

2.3. Prior empirical evidence

Over more than two decades, a considerable and multifaceted body of empirical research on risk disclosures provided in narrative sections of financial reports by non-financial firms has emerged. This body of research covers three broad strands:

(1) studies that describe the volume and characteristics of risk disclosures (e.g., Carlon et al., 2003; Lajili and Zéghal, 2005; Greco, 2012; Abraham and Shrives, 2014; Kajüter et al., 2015; Montag, 2015; for review Dobler, 2008);

(2) studies that explore the determinants of risk disclosures (e.g., Abraham and Cox, 2007; Miihkinen, 2012; Buckby et al., 2015; Cordazzo et al., 2017; Saggar and Singh, 2017; Bravo, 2018; for review Khlif and Hussainey, 2016); and

(3) studies that examine the consequences of risk disclosures on capital markets (e.g., Kravet and Muslu, 2013; Miihkinen, 2013; Campbell et al., 2014; Elshandidy and Shrives, 2016; Bravo, 2017; Chiu et al., 2018; for review Elshandidy et al., 2018).

The first two strands are most relevant to this paper. Most studies exploit a single-country setting (Elshandidy et al., 2015; Dobler et al., 2016), and by focusing on Germany our paper is no exception in this regard.

Descriptive evidence documents substantial variation in the volume and characteristics of risk disclosures in both low regulated and high regulated settings but suggests that characteristics of risk disclosures relate to disclosure regulations to some extent (Kajüter, 2004; Dobler et al., 2011; Greco, 2012; Miihkinen, 2012). Based on early work by Lajili and Zéghal (2005) and Linsley and Shrives (2006), a number of studies analyze the characteristics of risk disclosures by distinguishing different types of disclosures. For German listed firms in the manufacturing sector, Dobler et al. (2011) find more non-financial than financial, more qualitative than quantitative, and more historic/non-time specific than forward-looking risk disclosures. Contrasting with prior notions, they find no significant difference in the volume of disclosures on risk sources and risk management. Evidence on whether good or bad news (Kajüter et al., 2015; Elshandidy and Shrives, 2016) and whether mandatory or voluntary disclosures (Elshandidy et al., 2015; Cordazzo et al., 2017) are more prevalent in German listed firms' risk disclosures is mixed and subject to design issues.

Beyond the country-level and industry-level, there is considerable, yet partly mixed evidence on firm-level determinants of risk disclosures. Meta-analytic evidence by Khlif and Hussainey (2016) indicates that firm size, profitability, and risk exposure are most often explored determinants, and each of them is positively associated with risk disclosures (while moderators affect the associations). For various countries, studies find positive associations between risk disclosures and strong corporate governance, e.g., proxied by the

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[1] The requirements set out in GAS 5 and GAS 15 have been amended and merged in GAS 20 Group Management Report. GAS 20 contains sections that address risk disclosures in particular. As GAS 5 was superseded, however, there is currently no specific stand-alone standard on risk disclosures in place in Germany. In this study's sample year, the above disclosure requirements of the GCC and GAS 5 apply for listed and large non-listed firms in Germany

likewise. As of today, German risk disclosure regulations according to the GCC and GAS 20 differ between listed and non-listed firms in several respects. For instance, listed firms (including firms with listed debt securities) have to describe the key characteristics of the internal control and risk management system relevant for the consolidated financial accounting process.

number of independent executive directors, board size, and Big-4 auditors (Abraham and Cox, 2007; Lajili et al., 2012; Mokhtar and Mellett, 2013; Ntim et al., 2013). Several studies find that risk disclosures are negatively related to concentrated ownership (Ntim et al., 2013; Saggar and Singh, 2017), while others find mixed evidence (Mokhtar and Mellett, 2013; Jia et al., 2016) or no association (Elshandidy and Neri, 2015). Evidence on German listed firms is consistent with a size-effect, indecisive with regard to profitability and risk exposure (Kajüter, 2004; Dobler et al., 2011; Elshandidy et al., 2015; Elshandidy and Shrives, 2016), and limited with regard to attributes of governance and ownership (Kajüter, 2004; Elshandidy and Shrives, 2016).

Apart from financial sectors, empirical research in the field has concentrated on listed firms. There is a paucity of research focusing on risk disclosures by non-listed non-financial firms. The study of Oliveira et al. (2011) is a notable exception that analyzes characteristics and determinants of risk disclosures for a Portuguese sample of listed and non-listed firms. However, their study does not present separate results for non-listed firms. For Germany, papers published in professional journals provide limited insights (e.g., Ergün et al., 2015; Montag, 2015). None of these papers explores the composition or the determinants of risk disclosures in depth or conducts statistical tests. Thus, our study is the first to analyze the characteristics and determinants of risk disclosures by German non-listed firms in the manufacturing sector.

3. HYPOTHESES

3.1. Characteristics of risk disclosures

Based on German regulations on risk disclosures and discretionary disclosure theory (Verrecchia, 2001; Dobler, 2008), our first set of hypotheses addresses the characteristics of risk disclosures.

German regulations take a comprehensive approach on risk disclosures but include specific disclosure requirements referring to financial types of risk and their management, implying more room for discretion in non-financial rather than financial risk disclosures (Dobler, 2008). In non-financial sectors, firms are known to face a variety of non-financial risks to be managed. Discretionary disclosure theory suggests that firms respond by providing non-financial risk disclosures. The latter have been found to outweigh financial risk disclosures in terms of volume for German listed firms (Dobler et al., 2011). Derivatives usage and exposure to issues related financial instruments are typically more prevalent in listed rather than non-listed firms (Lins et al., 2011; Bodnar et al., 2013). Non-listed firms are thus likely to have limited information on financial risk and financial risk management to disclose. Therefore, the first hypothesis states:

H₁ₐ: The volume of non-financial risk disclosures is larger than the volume of financial risk disclosures.

German regulations require disclosures on risk sources and risk management. Discretionary disclosure theory implies that firms have incentives to supplement disclosures on risk sources by disclosures on how risks are managed at least if active means of risk handling are in place (Dobler et al., 2011). Besides signalling their quality, firms may

inform about risk management systems in place in an attempt to enhance their legitimacy or to deflect attention from specific risks of concern. While it could be argued that non-listed firms may have deficits incorporate risk management systems, such deficits limit firms' information available on risk sources as well (Dobler, 2008). We consider these assessments to hold for both non-financial and financial risk disclosures, although Sec. 289, 315 GCC do not explicitly mandate non-listed firms to provide disclosures on non-financial risk management. Against this background, the next two hypotheses state:

H₁ᵦ: For non-financial risk disclosures, the volume of disclosures on risk sources does not differ from the volume of disclosures on risk management.

H₁ᵧ: For financial risk disclosures, the volume of disclosures on risk sources does not differ from the volume of disclosures on risk management.

GAS 5 requires quantitative risk disclosures only under specific circumstances. Prior evidence on German listed firms' documents overall little quantitative risk disclosures. Discretionary disclosure theory implies that uncertainty of information endowment and disclosure costs can lead firms to withhold information (Dobler, 2008). Lack of advanced systems that allow quantifying risks rather than unfavourable external effects suggests that non-listed firms provide very limited quantitative risk disclosures. Consistent with Linsley and Shrives (2006), the final hypothesis of the first set thus states:

H₁ᵈ: The volume of qualitative risk disclosures is larger than the volume of quantitative risk disclosures.

3.2. Determinants of risk disclosures

Based on agency theory (Jensen and Meckling, 1976; Fama and Jensen, 1983), our second set of hypotheses addresses associations between the volume of risk disclosures and key characteristics of governance and ownership among non-listed firms.

With regard to corporate governance, supervisory boards serve as a monitoring mechanism to mitigate information asymmetry and agency conflicts between management and owners in German limited companies. Yet, not all limited companies are obliged to have a supervisory board or have one in place. While suggesting that characteristics of the supervisory board and its member's matter, agency theory proposes that firms with a supervisory board in place are more inclined to provide disclosures than others (Jensen and Meckling, 1976; Haniffa and Cooke, 2002). To the extent a supervisory board actually acts on behalf of all owners and monitors compliance with disclosure regulations, its existence is likely to safeguard substantial risk disclosures by non-listed firms. This assessment is in line with arguments on independent and non-executive directors (García-Meca and Sánchez-Ballesta, 2010; Boubaker et al., 2015) that have been adapted in risk disclosure literature (Abraham and Cox, 2007; Ntim et al., 2013). Therefore, the first hypothesis of the second set states:

H₂ₐ: Ceteris paribus, the volume of risk disclosures is positively associated with the existence of a supervisory board.

An external audit of corporate reports serves as an institutional mechanism to mitigate agency conflicts (Mautz and Sharaf, 1961). Based on agency

theory, audit quality or auditor reputation as represented by the use of a Big-4 auditor is typically assumed to relate to advanced risk disclosures (Oliveira et al., 2011; Mokhtar and Mellett, 2013). While one would doubt why high-quality audit should be associated with more risk disclosures in a voluntary disclosure setting, risk disclosures are highly regulated in Germany, albeit leaving room for discretion. Non-listed firms typically have limited disclosure incentives, and the auditor plays a key role to assess compliance with disclosure regulations (Hope et al., 2012, Minnis and Shroff, 2017). That way, a high-quality auditor is likely to lead to a relatively high volume of risk disclosures by safeguarding a high level of compliance with disclosure regulations in non-listed firms in order to protect auditor reputation. Thus, the next hypothesis states:

H₂ᵦ: Ceteris paribus, the volume of risk disclosures is positively associated with the use of a Big-4 auditor.

Agency theory posits that concentrated ownership is associated with limited disclosures (Jensen and Meckling, 1976; Eng and Mak, 2003). Blockholders are likely to have access to private information channels and to oppose enhanced disclosures to protect private control benefits (Leuz and Wüstemann, 2004; Allegrini and Greco, 2013). These arguments have been raised in the context of risk disclosures (Ntim et al., 2013; Oliveira et al., 2018) and are particularly likely to hold for non-listed firms that are less inclined to public scrutiny than are listed firms. This paper focuses on concentrated ownership in terms of a firm's status as a subsidiary (controlled by another entity) and family firm (owned by a family). Subsidiaries are likely to be subject to disclosure policy by parent companies that restrict disclosures on lower levels within the group. Family-owned firms, which are prevalent in the German setting, are typically assumed to provide limited disclosures (Ali et al., 2007; Salvato and Moores, 2010). Given substantial room for discretion, these assessments should hold in the context of risk disclosures in particular. Therefore, the final hypotheses state:

H₂ᵧ: Ceteris paribus, the volume of risk disclosures is associated with a firm's status as a subsidiary.

H₂ₔ: Ceteris paribus, the volume of risk disclosures is negatively associated with a firm's status as a family firm.

4. RESEARCH DESIGN

4.1. Sample selection

As motivated in the Introduction, the sample of this study consists of German non-listed firms in the manufacturing sector in the year 2010. Sample selection follows a two-step procedure. In the first step, we use the Amadeus database to identify active, non-listed, at least medium-sized German firms with primary NACE codes 10-32 for which consolidated financial statements and total assets are available for 2010. This yields 484 firms. In the second step, we select the largest 100 firms as measured by total assets that meet two conditions: consolidated financial statements are prepared under German GAAP in 2010, and group annual reports for 2010 are

available from the Federal Gazette (Bundesanzeiger) as of June 1, 2012. By focusing on firms providing consolidated financial statements under German GAAP we ensure that sample firms are neither listed nor capital market-oriented (Eierle et al., 2018) and avoid impacts of different or multiple accounting standards on risk disclosures and financial control variables used in the regression analyses.

Comprising 100 firms, the sample size of this study is similar to sample-sizes in prior studies using manual content analysis of risk disclosures of listed firms (e.g., Linsley and Shrives, 2006; Amran et al., 2008; Mokhtar and Mellett, 2013; Oliveira et al., 2018).

4.2. Coding instrument

We employ manual content analysis to explore risk disclosures in the management report section of the sample firms' annual reports. We focus on the management report section because it is the key location for risk disclosures in German annual reports. To identify risk disclosures, we refer to the widely accepted definition by Linsley and Shrives (2006, p. 389), presented in Section 2.1.

Consistent with prior studies using manual content analysis on risk disclosures, the unit of analysis is 'sentence' rather than 'word' (Beretta and Bozzolan, 2004; Linsley and Shrives, 2006; Dobler et al., 2011; Jia et al., 2016). This choice is justified because it mitigates issues of inter-coder reliability and acknowledges that words cannot be coded and interpreted without the context of a sentence (Milne and Adler, 1999). That way, we capture the volume of risk disclosures (*RD*) but not necessarily the quality of risk disclosures.

After an initial review of ten randomly selected annual reports, we employ a three-dimensional coding instrument. Consistent with Dobler et al. (2011), each risk disclosure sentence is classified according to its semantic properties as follows:

(1) type of risk: non-financial (*NFIN*) versus financial (*FIN*);

(2) type of reference to risk: risk source (*RS*) versus risk management (*RM*); and

(3) type of information: qualitative (*QL*) versus quantitative (*QT*).

To ensure reliability a single experienced coder conducted the coding of the entire sample under the supervision of the first author. The coder was trained, provided with disambiguation rules, and replicated the initial pretest coding of ten annual reports with a high level of consistency. Any disagreements were discussed for reconciliation. Moreover, the first author independently replicated the coder's coding for five randomly selected annual reports. Disagreements were minimal, indicating a high level of inter-coder reliability.

4.3. Regression model and independent variables

While employing Wilcoxon and *t*-tests to address the first set of hypotheses, we use OLS regressions to test the second set of hypotheses. Particularly, we estimate the following regression model using the volume of total (*RD_TOT*), non-financial (*RD_NFIN*), or financial risk disclosures (*RD_FIN*) as dependent variable (*RD*):

$$RD = \alpha + \beta_1 SBRD + \beta_2 BIG4 + \beta_3 SUBS + \beta_4 FMLY + \beta_5 SIZ + \beta_6 ROA + \beta_7 SFR + \beta_8 LEV + \beta_9 DER + \varepsilon \qquad (1)$$

where firm subscripts are suppressed. All variables are defined in Appendix A.

To test H$_{2a}$ to H$_{2d}$, the model includes a sequence of dummy variables, taking the value 1 if a supervisory board is in place (*SBRD*), a Big-4 auditor is engaged (*BIG4*), a firm is a subsidiary controlled by another entity (*SUBS*), or a firm is owned by a family firm (*FMLY*), respectively, and 0 otherwise. *SBRD* and *BIG4* are collected from annual reports. *SUBS* is determined based on Amadeus database and annual reports of the firm and its parent, where data in annual reports are used in case of disagreements. *FMLY* is based on lists of the largest German family firms compiled by the Foundation of Family Businesses in Germany and Europe (Stiftung Familienunternehmen; Niefert et al., 2009; Gottschalk et al., 2011). The lists define a family firm by reference to the majority of voting ownership in the hands of a family. The data from the lists are cross-checked and in a few cases completed with data provided in corporate reports. The hypotheses H$_{2a}$ to H$_{2d}$ suggest positive (and significant) coefficients on *SBRD* and *BIG4* and negative (and significant) coefficients on *SUBS* and *FMLY*.

The use of dummy research variables can be seen as a limitation of this study. While *BIG4* is a common variable in empirical accounting research and we are able to collect the number of members of the supervisory board from annual reports (*#SBRD*), detailed and reliable ownership data is difficult to obtain for this study's sample of non-listed firms. For sake of consistency, we decide to use dummy research variables in the main regression analyses. Additional data collected are used in our sensitivity analyses.

The model includes five control variables, collected from annual reports and cross-checked with Amadeus database where possible. Firm size (*SIZ*) controls a firm's overall disclosure policy. Consistent with prior literature, we expect a positive coefficient on *SIZ*. Return on assets (*ROA*) controls for a firm's performance and can be expected to be negatively associated with *RD* (Miihkinen, 2012; Elshandidy et al., 2015). The share of foreign revenues (*SFR*) and leverage (*LEV*) control for a firm risk (Goldberg and Heflin, 1995; Dobler et al., 2011). Discretionary disclosure theory implies positive coefficients on both variables. In addition, we include a dummy variable (*DER*) equal to 1 if a firm's annual report indicates a material use of derivative financial instruments, and 0 otherwise. This variable particularly controls for potential effects of the use of such financial instruments might have given specific risk disclosure requirements related to financial instruments. Thus, we expect a positive coefficient on *DER*.

5. RESULTS AND DISCUSSION

5.1. Descriptive statistics

Table 1 reports descriptive statistics on the volume of total risk disclosures and the independent variables used in the regression model. While *RD_TOT* ranges from 1 to 104, the average unlisted manufacturing firm reports 33 risk disclosure sentences[2]. This average volume is higher than the one reported by Montag (2015) for a sample of German non-financial, non-listed firms (with substantially smaller average firm size). Yet, it is just about one-fourth of the average volume documented by Dobler et al. (2011) for a sample of German listed manufacturing firms (with slightly larger average firm size) based on consistent coding procedures. The finding seems to suggest a relatively low volume of risk disclosures of non-listed firms as compared to listed firms in Germany.

Table 1. Descriptive statistics

Panel A: Continuous variables					
Variable	Mean	St. dev.	Median	Min	Max
RD_TOT	33.190	21.109	29.500	1.000	104.000
SIZ	19.682	0.865	19.470	18.431	22.550
ROA	0.058	0.065	0.053	−0.121	0.356
SFR	0.540	0.223	0.534	0.000	0.953
LEV	0.400	0.190	0.386	0.054	0.890
Panel B: Dummy variables					
Variable	Mean		St. dev.		Median
SBRD	0.390		0.490		0.000
BIG4	0.520		0.502		1.000
SUBS	0.110		0.314		0.000
FMLY	0.340		0.476		0.000
DER	0.810		0.394		1.000

Notes: Variables are defined in Appendix A.

Panel A: RD_TOT = Total volume of risk disclosures measured as number of sentences; SIZ = Firm size measured as the natural logarithm of total assets; ROA = Return on assets measured as net income divided by total assets; SFR = Share of foreign revenues measured as foreign revenues divided by total revenues; LEV = Leverage measured as total liabilities divided by total assets.

Panel B: SBRD = Dummy variable equal to 1 if the firm has a supervisory board, and 0 otherwise; BIG4 = Dummy variable equal to 1 if the firm is audited by a Big-4 auditor, and 0 otherwise; SUBS = Dummy variable equal to 1 if the firm is a subsidiary, and 0 otherwise; FMLY = Dummy variable equal to 1 if the firm is a family firm, and 0 otherwise; DER = Dummy variable equal to 1 in case of material use of derivatives, and 0 otherwise.

Table 1 indicates that 39% of sample firms have a supervisory board in place. About half of the sample firms are audited by a Big-4 auditor. 11% of sample firms are controlled by another entity, and 34% are in the hands of a family. The latter finding is consistent with the observation of a substantial number of large non-listed family firms in Germany (Gottschalk et al., 2011).

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[2] The sample firm with only one risk disclosure sentence states that management was 'unaware of extraordinary chances and risk of the group' (translated by the authors). Still, the non-Big-4 auditor issued an unqualified audit opinion. This example may suggest non-compliance with existing risk disclosure regulations.

SIZ indicates that sample firms' total assets cover a wide range from m€ 101 to m€ 6,211. Mean *ROA* is almost 6%. For the average sample firm, *SFR* is equal to 54% and a *LEV* is equal to 40%, indicating considerable international business and a moderate leverage. 81% of sample firms indicate material use derivatives (*DER*) and thus can be expected to provide related financial risk disclosures.

5.2. Results on the characteristics of risk disclosures

Table 2 presents the results on the first set of hypotheses on characteristics of risk disclosures.

Panel A reveals that all sample firms report on non-financial risk while seven firms do not report on financial risk. The average firm reports 25 sentences on non-financial risk and eight sentences on financial risk. Wilcoxon and t-tests indicate that *RD_NFIN* significantly outweighs *RD_FIN* (p < 0.001). The results support H_{1a} and are consistent with Dobler et al. (2011). They supplement descriptive findings by Ergün et al. (2015) who document that about 38% of individual risks addressed by German non-listed wholesale and foreign trade firms are financial types of risk.

Table 2. Composition and characteristics of risk disclosures

	Mean	Std. dev.	Median	# Firms with no disclosure	Min	Max	Wilcoxon-test |Z| (p)	t-test |T| (p)
Panel A: Non-financial versus financial risk disclosures (H_{1a})								
RD_NFIN	25.03	16.36	22.00	0	1	78	8.539***	12.509***
RD_FIN	8.16	6.79	7.00	7	0	32	(<0.001)	(<0.001)
Panel B: Disclosures on risk sources versus disclosures on risk management								
RD_RS	15.91	10.63	13.50	0	1	50	1.181	1.236
RD_RM	17.28	13.08	14.50	4	1	59	(0.238)	(0.219)
Panel C: Non-financial risk disclosures – Risk sources versus risk management (H_{1b})								
RD_NFIN_RS	12.66	8.37	11.00	0	1	34	0.275	0.303
RD_NFIN_RM	12.37	10.31	10.00	4	0	50	(0.783)	(0.762)
Panel D: Financial risk disclosures – Risk sources versus risk management (H_{1c})								
RD_FIN_RS	3.26	3.69	2.00	19	0	16	4.747***	4.770***
RD_FIN_RM	4.90	3.93	4.50	12	0	17	(<0.001)	(<0.001)
Panel E: Qualitative versus quantitative risk disclosures (H_{1d})								
RD_QL	32.60	20.61	29.50	0	1	100	8.682***	15.856***
RD_QT	0.59	1.28	0.00	72	0	8	(<0.001)	(<0.001)

*Notes: ***, **, * indicate significance at the 1%, 5%, 10% level, respectively. Variables are defined in Appendix A.*

Panel A: RD_NFIN = Volume of non-financial risk disclosures measured as a number of sentences; RD_FIN = Volume of financial risk disclosures measured as the number of sentences.

Panel B: RD_RS = Volume of disclosures on risk sources measured as a number of sentences; RD_RM = Volume of disclosures on risk management measured as the number of sentences.

Panel C: RD_NFIN_RS = Volume of non-financial risk disclosures on risk sources measured as a number of sentences; RD_NFIN_RM = Volume of non-financial risk disclosures on risk management measured as the number of sentences.

Panel D: RD_FIN_RS = Volume of financial risk disclosures on risk sources measured as a number of sentences; RD_FIN_RM = Volume of financial risk disclosures on risk management measured as the number of sentences.

Panel E: RD_QL = Volume of qualitative risk disclosures measured as number of sentences; RD_QT = Volume of quantitative risk disclosures measured as the number of sentences.

Panel B of Table 2 indicates that there is no significant difference between *RD_RS* and *RD_RM*. This finding is consistent with Dobler et al. (2011), suggesting that sample firms report on risk sources and risk management in a rather balanced way. We further distinguish between non-financial and financial types of risk disclosures. As reported in Panel C, the average sample firm's non-financial risk disclosures are composed of 13 sentences on risk sources and 12 sentences on risk management. Neither test indicates a significant difference between *RD_NFIN_RS* and *RD_NFIN_RM*, thereby supporting H_{1b}. In turn, Panel D shows that three sentences on financial risk sources but five sentences on financial risk management are disclosed on average. Wilcoxon and *t*-tests reveal that the difference between *RD_FIN_RS* and *RD_FIN_RM* is significant (p < 0.001). This result is inconsistent with H_{1c}. It suggests that sample firms put more emphasis on disclosures on risk management than on risk sources when addressing financial types of risk, which may relate to the GCC explicitly requiring disclosures on risk management associated with financial instruments deployed.

Panel E of Table 2 reveals that sample firms are very restrictive in providing quantitative risk disclosures. We observe 72 firms that do not provide quantitative risk disclosures. Wilcoxon and t-tests indicate that *RD_QL* dominates *RD_QT* (p < 0.001).

This result supports H_{1d}. Compared to findings on listed firms in Germany (e.g., Dobler et al. 2011), sample firms seem to exhibit a particularly low volume of quantitative risk disclosures. The finding may relate to sample firms lacking adequate systems to quantify risk or strong incentives to withhold quantitative information available.

5.3. Regression results on determinants of risk disclosures

Table 3 presents Pearson correlations between the continuous variables used in the regression models. In absolute terms, the highest correlation between continuous independent variables is equal to 0.391. VIFs calculated suggest that multicollinearity is not a severe issue. Correlations between each dependent variable and the independent variables all have the expected signs.

Table 4 reports the regression results on the second set of hypotheses for *RD_TOT*, *RD_NFIN*, and *RD_FIN*. Across the board, all coefficients show the expected signs. While *RD_TOT* and *RD_NFIN* seem to be significantly associated with the same explanatory variables, we observe a different pattern with regard to *RD_FIN*.

The first column of result in Table 4 reveals that *RD_TOT* is significantly positively associated with the

existence of a supervisory board (p = 0.002) and the use of a Big-4 auditor (p = 0.013), while significantly negatively associated with a firm's status as a subsidiary (p = 0.037) and a family firm (p = 0.090).

The results support hypotheses H_{2a} to H_{2d}. Consistent with agency theory, they imply that attributes of strong governance (concentrated ownership) relate to high (low) volumes of risk disclosures.

Table 3. Pearson correlations between continuous variables

	ROA	SFR	LEV	RD_TOT	RD_NFIN	RD_FIN
SIZ	0.011	0.172*	–0.102	0.391***	0.419***	0.206**
ROA		0.257**	–0.391***	–0.151	–0.141	–0.131
SFR			–0.312***	0.163	0.145	0.157
LEV				0.054	0.033	0.090

Notes: ***, **, * indicate significance at the 1%, 5%, 10% level, respectively. Variables are defined in Appendix A.

Independent variables: SIZ = Firm size measured as the natural logarithm of total assets; ROA = Return on assets measured as net income divided by total assets; SFR = Share of foreign revenues measured as foreign revenues divided by total revenues; LEV = Leverage measured as total liabilities divided by total assets.

Dependent variables: RD_TOT = Total volume of risk disclosures measured as a number of sentences; RD_NFIN = Volume of non-financial risk disclosures measured as the number of sentences; RD_FIN = Volume of financial risk disclosures measured as the number of sentences.

Table 4. Main regression results

	Exp. sign	RD_TOT	RD_NFIN	RD_FIN
SBRD	+ (H_{2a})	12.112*** (0.002)	7.478** (0.016)	4.634*** (0.001)
BIG4	+ (H_{2b})	10.109** (0.013)	8.629*** (0.007)	1.480 (0.294)
SUBS	– (H_{2c})	–14.302** (0.037)	–12.212** (0.023)	–2.091 (0.381)
FMLY	– (H_{2d})	–6.784* (0.090)	–5.173* (0.098)	–1.611 (0.252)
SIZ	+	7.040*** (0.002)	6.038*** (0.001)	1.002 (0.207)
ROA	–	–66.169** (0.035)	–51.572** (0.036)	–14.598 (0.184)
SFR	+	13.262 (0.133)	7.935 (0.248)	5.327* (0.087)
LEV	+	8.952 (0.432)	2.702 (0.761)	6.250 (0.121)
DER	+	7.413 (0.140)	4.954 (0.206)	2.459 (0.165)
Intercept	?	–124.415*** (0.005)	–104.523*** (0.003)	–19.892 (0.199)
Adj. R^2		0.307	0.296	0.168
F		5.875***	5.626***	3.228***
N		100	100	100

Notes: The last three columns of Table 4 report coefficients and, in parentheses, p values from OLS regressions. ***, **, * indicate significance at the 1%, 5%, 10% level, respectively. Max. VIF is equal to 1.493 in each regression, suggesting that multicollinearity is not a severe issue. Variables are defined in Appendix A.

Dependent variables: RD_TOT = Total volume of risk disclosures measured as a number of sentences; RD_NFIN = Volume of non-financial risk disclosures measured as the number of sentences; RD_FIN = Volume of financial risk disclosures measured as the number of sentences.

Research variables: SBRD = Dummy variable equal to 1 if the firm has a supervisory board, and 0 otherwise; BIG4 = Dummy variable equal to 1 if the firm is audited by a Big-4 auditor, and 0 otherwise; SUBS = Dummy variable equal to 1 if the firm is a subsidiary, and 0 otherwise; FMLY = Dummy variable equal to 1 if the firm is a family firm, and 0 otherwise.

Control variables: SIZ = Firm size measured as the natural logarithm of total assets; ROA = Return on assets measured as net income divided by total assets; SFR = Share of foreign revenues measured as foreign revenues divided by total revenues; LEV = Leverage measured as total liabilities divided by total assets; DER = Dummy variable equal to 1 in case of material use of derivatives, and 0 otherwise.

With regard to the control variables, *RD_TOT* is positively and significantly associated with *SIZ* at the 1% level and negatively and significantly associated with *ROA* at the 5% level. These findings suggest that larger and less profitable sample firms provide more risk disclosures. The coefficients on *SFR*, *LEV*, and *DER* are insignificant.

As shown in the second last column of Table 4, results on *RD_NFIN* are qualitatively the same as for *RD_TOT*. The last column presents results on *RD_FIN*. Consistent with H_{1a}, *RD_FIN* is significantly and positively associated with the existence of a supervisory board (p = 0.001). However, results reveal no significant association between *RD_FIN* and each of the other governance and ownership variables at conventional levels. Results indicate that *SFR* is the only control variable that is significantly associated

with *RD_FIN* (at the 10% level). Albeit positive, even the coefficient on *DER* does not significantly differ from 0 (p = 0.165). The results with regard to *RD_FIN*, however, should be interpreted with care due to the rather low variation in the dependent variable. Yet, this low variation is consistent with low variation in *DER* and rather detailed regulations on financial risk disclosures that restrict room for discretion.

In summary, our findings suggest that the volume of risk disclosures by non-listed German firms is associated with key characteristics of governance and ownership in a way consistent with agency theory. Such key characteristics even seem to play a role in determining the volume of financial risk disclosures that are subject to more detailed regulations than non-financial risk disclosures.

5.4. Sensitivity analyses

Several sensitivity analyses are performed in order to assess whether results of the main analyses are robust. First, we replicate all tests for those firms that provide risk disclosures ($RD > 0$) of the types addressed to avoid potential bias by non-disclosing firms. The results remain unaffected. Second, we limit the sample to 78 firms that are not obliged to have a supervisory board and find that regressions result qualitatively hold for this subsample. Third, we re-estimate the regressions including the number of supervisory board members ($\#SBRD$) rather than the dummy variable $SBRD$. Results are qualitatively the same as in the main analyses. In each regression, the coefficient on $\#SBRD$ is positive and significant at the 5% level, while the coefficient on $FMLY$, albeit negative, is not significant at conventional levels. Fourth, we separately include three additional variables in the regression model: the interaction term $SBRD*BIG4$ (as an additional governance variable), total asset turnover, and intangible assets scaled by total assets (as additional control variables). Coefficients on each additional variable are insignificant, and the main results hold. Finally, we use the ranks of RD rather than the absolute values as independent variables in the regression models. The results are qualitatively unchanged with the notable exception that the negative coefficients on $FMLY$ are insignificant at conventional levels in RD_TOT and RD_NFIN regressions. In summary, the results of our main analyses seem qualitatively robust.

6. CONCLUSIONS

While empirical risk disclosure research has focused on listed firms, this paper exploits the German setting to provide evidence on risk disclosures by non-listed manufacturing firms. Compared to prior evidence on German listed firms, our results suggest that non-listed firms exhibit a lower volume of risk disclosures than do listed firms but follow similar patterns in respect to the composition of risk disclosures. These patterns are largely in line with risk disclosure regulations and discretionary disclosure theory. Results indicate that the volume of risk disclosures is positively associated with the existence and size of a supervisory board and the use of a Big-4 auditor, and negatively associated with a firm's status as a subsidiary and a family firm. The findings on the relations between risk disclosures and key attributes of governance and ownership are consistent with agency theory.

Despite its contributions to existing literature, our paper is subject to several limitations, which in turn suggest opportunities for future research. First, the paper largely relies on dichotomous variables on governance and ownership due to limited data on non-listed firms available to the authors. Future research could try to collect and exploit more detailed data to provide additional insights, e.g., on the impact of supervisory board diversity, ruling family members in the management board, or patterns of ownership in non-listed firms. Second, this paper is limited to one period. Future research could use longitudinal approaches, e.g., to assess how changes in governance or ownership affect risk disclosures. Third, our paper only investigates non-listed firms. Studies comparing risk disclosures between listed and non-listed firms could directly assess how listing and related differences in regulations or firm characteristics determine risk disclosures.

Overall, risk disclosures by non-listed firms offer promising avenues for future research in the field beyond those identified by Elshandidy et al. (2018). This paper can be seen as an attempt to drive risk disclosure research in non-financial sectors beyond the scope of listed firms. Further evidence in both highly and lowly regulated settings will be warranted to increase our understanding of the characteristics, determinants, and effects of non-listed firms' risk disclosures that are largely at managerial discretion.

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Appendix A. Variable definitions

Variable	Definition
Panel A: Variables on volume of risk disclosures (RD) (depicted by content analysis of annual reports 2010)	
RD_FIN	Volume of financial risk disclosures measured as the number of sentences
RD_FIN_RM	Volume of financial risk disclosures on risk management measured as the number of sentences
RD_FIN_RS	Volume of financial risk disclosures on risk sources measured as the number of sentences
RD_NFIN	Volume of non-financial risk disclosures measured as the number of sentences
RD_NFIN_RM	Volume of non-financial risk disclosures on risk management measured as the number of sentences
RD_NFIN_RS	Volume of non-financial risk disclosures on risk sources measured as the number of sentences
RD_QL	Volume of qualitative risk disclosures measured as the number of sentences
RD_QT	Volume of quantitative risk disclosures measured as the number of sentences
RD_RM	Volume of disclosures on risk management measured as the number of sentences
RD_RS	Volume of disclosures on risk sources measured as the number of sentences
RD_TOT	Total volume of risk disclosures measured as the number of sentences
Panel B: Research variables on governance and ownership	
BIG4	Dummy variable equal to 1 if the firm is audited by a Big-4 auditor, and 0 otherwise (collected from annual reports 2010)
FMLY	Dummy variable equal to 1 if the firm is a family firm, and 0 otherwise (collected from Niefert et al., 2009; Gottschalk et al., 2011; cross-checked and completed with data in corporate reports)
SBRD	Dummy variable equal to 1 if the firm has a supervisory board, and 0 otherwise (collected from annual reports 2010)
#SBRD	Number of supervisory board members (collected from annual reports 2010)
SUBS	Dummy variable equal to 1 if the firm is a subsidiary, and 0 otherwise (collected from Amadeus database and annual reports 2010)
Panel C: Control variables	
DER	Dummy variable equal to 1 in case of material use of derivatives, and 0 otherwise (collected from annual reports 2010)
LEV	Leverage measured as total liabilities divided by total assets at financial year end 2010 (collected from annual reports 2010)
ROA	Return on assets measured as net income in 2010 divided by total assets at financial year end 2009 (collected from annual reports 2010)
SFR	Share of foreign revenues measured as foreign revenues divided by total revenues in 2010 (collected from annual reports 2010)
SIZ	Firm size measured as the natural logarithm of total assets at financial year end 2010 (collected from the annual reports 2010)