



HAL
open science

The risks of mergers and acquisitions-Analyzing the incentives for risk reporting in Item 1A of 10-K filings

Christian Ott

► To cite this version:

Christian Ott. The risks of mergers and acquisitions-Analyzing the incentives for risk reporting in Item 1A of 10-K filings. *Journal of Business Research*, 2020, 106, pp.158 - 181. <10.1016/j.jbusres.2019.08.028>. <hal-03488581>

HAL Id: hal-03488581

<https://hal.science/hal-03488581v1>

Submitted on 20 Jul 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons CC BY-NC 4.0 - Attribution - Non-commercial use - International License

The risks of mergers and acquisitions—Analyzing the incentives for risk reporting in Item 1A of 10-K filings[‡]

Ott, Christian^{*}

[‡] Acknowledgements: I would like to thank the editors, the associate editor Mine Ertugrul, two anonymous reviewers from the Journal of Business Research, Lucia Bellora-Bienengräber, Maik Hamann, and Frank Schiemann for their valuable feedback. Moreover, I would like to thank my research assistants Marko Anastasov, Stefan Deike, and Jakob Kruschwitz for supporting me in collecting the M&A risk reporting, developing the coding scheme, and coding an initial sample of the M&A risk reporting.

^{*} Correspondence Address:
Christian Ott
Université de Strasbourg
EM Strasbourg Business School
Associate Professor of Finance, Accounting, and Control
61 Avenue de la Forêt-Noire
67000 Strasbourg
France
Tel.: +33 3 68 85 87 11
E-mail: christian.ott@em-strasbourg.eu

The risks of mergers and acquisitions—Analyzing the incentives for risk reporting in Item 1A of 10-K filings

Abstract

This paper investigates the motivations behind the associations between the M&A risk level and the M&A risk reporting. For a sample of 231 M&As, I performed a detailed content analysis of Item 1A of the 10-K filing after the completion of M&As. While the M&A risk reporting quantity captures the number of M&A risk factors, the M&A risk reporting quality additionally reflects the M&A risk reporting depth and width. The results suggest that the M&A risk reporting quantity and quality are related but not identical theoretical constructs. Overall, consistent with the transparency motivation, a higher M&A risk level encourages managers to increase the M&A risk reporting quantity and quality. Managers will disclose more M&A risk factors if the target firm is relatively large and from a foreign country, a relatively large amount of the purchase price is allocated to goodwill, and the M&A intensity is high.

Keywords: risk reporting; risk level; goodwill; purchase price allocation; content analysis

1. Introduction

Mergers and acquisitions (M&As) are highly popular growth opportunities for firms (Ahmed & Elshandidy, 2016; Ferreira, Santos, de Almeida, & Reis, 2014); however, they may influence the combined firm's risk profile considerably in terms of increased uncertainty about its future cash flows.¹ Because prior research suggests that the acquirer firm's shareholders mostly experience negative share price performance in the months following the announcement of an M&A (Agrawal & Jaffe, 2001; King, Dalton, Daily, & Covin, 2004), the shareholders expect the acquirer firm's managers to inform them about the M&A risk level and its impact on the combined firm's risk profile. This paper focuses on examining the association between the M&A risk level and the M&A risk reporting quantity and quality.

The setting of M&As is particularly attractive for studying managers' motivations for risk reporting. Before committing to an M&A, managers usually conduct due diligence (Cullinan, Le Roux, & Weddigen, 2004; Perry & Herd, 2004; Rosenbloom, 2002). By reviewing the target firm's financial statements and anything else deemed material (e.g., contracts and intellectual property issues), they try to confirm the facts about the firm's ability to realize value from the M&A. Because they identify and assess the risks associated with M&As during due diligence, they gain access to private information about the M&A risk level. The shareholders are aware that the managers have such private information after due diligence and expect them to disclose the identified M&A risk factors. This knowledge may motivate the managers to report the risk factors transparently (Heinle & Smith, 2017; Jorgensen & Kirschenheiter, 2003; Lin, 2010). If the managers provide detailed information about the M&A risk factors (transparency motivation), the shareholders gain insights into the M&A

¹ The Financial Accounting Standards Board (2001) recognized the riskiness of M&As in Appendix B to SFAS 141: "Because a business combination often results in a significant change to an entity's operations, [...] the information disclosed [...] bear[s] on users' abilities to assess the effects of such changes [...]." In addition, the financial press has regularly highlighted the fact that M&As are risky (Cartwright & Schoenberg, 2006).

risk level and thus can assess the combined firm's risk profile better. Thus, M&A risk reporting reduces the information asymmetry between the managers and the shareholders and increases the transparency (Heinle & Smith, 2017). Although this type of information might be useful for shareholders in valuing the combined firm's future prospects, managers may prefer to hide unfavorable information about the M&A risk factors or exercise discretion in disclosing it (opaqueness motivation). They may keep secret the risk factors that are specific to a particular M&A and instead only provide information about the common M&A risk factors, thereby hoping to avoid creating shareholder uncertainty about the risk level (Dobler, 2008; Jorgensen & Kirschenheiter, 2003).

Risk reporting has received increasing attention in recent years. In their review of the risk reporting literature, Elshandidy, Shrivess, Bamber, and Abraham (2018) distinguished two main strands of empirical research: (a) the motivations for risk reporting (e.g., Elshandidy, Fraser, & Hussainey, 2013; Linsley & Shrivess, 2006; Marshall & Weetman, 2007), which is also the focus of this paper, and (b) the consequences of risk reporting (e.g., Abraham & Shrivess, 2014; Filzen, 2015; Rajgopal, 1999). Overall, the findings of the first strand indicate that the risk level is associated with risk reporting. However, the emerging picture appears to be somewhat mixed with regard to the firm characteristics that are intended to capture the risk level (Elshandidy et al., 2018). Thus, it remains unclear whether the transparency or the opaqueness motivation explains risk reporting. This picture may arise from the different measures of risk reporting (e.g., Miihkinen, 2012), the differences between voluntary and mandatory risk reporting (e.g., Elshandidy et al., 2013), or the different countries involved (e.g., Dobler, Lajili, & Zéghal, 2011). Interestingly, none of the prior studies on the motivations have explored risk reporting as a response to a particular event (e.g., M&A) that considerably changed the firm's risk profile. An M&A not only combines the risk factors of the involved firms, but it also gives rise to new risk factors.

This paper focuses on M&As and pursues two research objectives. First, it investigates how the transparency or the opaqueness motivation explains M&A risk reporting. It is an empirical question about how the M&A risk level maps into the M&A risk reporting (Heinle & Smith, 2017; Jorgensen & Kirschenheiter, 2003). While prior studies on the motivations for risk reporting have suggested that the risk level is positively associated with the risk reporting quantity (e.g., Campbell, Chen, Dhaliwal, Lu, & Steele, 2014; Elshandidy, Fraser, & Hussainey, 2015), risk reporting has often been criticized for providing low risk reporting quality (Abraham & Shrivs, 2014). In addition to the M&A risk reporting quantity, the M&A risk reporting quality reflects the M&A risk reporting depth, which summarizes the properties of the M&A risk factors, and the M&A risk reporting width, which is a function of the coverage and dispersion of the M&A risk factors. This paper investigates how both the M&A risk reporting quantity and the M&A risk reporting quality reflect the M&A risk level, controlling for other acquirer firm characteristics (e.g., the pre-existing risk level and the quality of corporate governance). Second, this paper investigates which M&A risk factors managers tend to report to their shareholders. Using a coding scheme especially developed for this paper, I intend to identify the M&A risk factors occurring at different levels of analysis (i.e., macro-environment, industry, firm, and M&A itself) and measure its properties, including its type (i.e., quantitative vs. qualitative), nature (i.e., monetary vs. non-monetary), specificity (i.e., (un)related to a specific M&A), and time horizon (i.e., related to current or future M&A). Thus, I evaluate both the M&A risk reporting quantity and quality.

This paper analyzes the M&A risk reporting of 231 US acquirer firms. To exclude the influence of different countries, I focus on the US, which has very advanced risk reporting regulations (Dobler et al., 2011; Elshandidy et al., 2015). Managers have been required to report on risk factors in several items of the 10-K filing. For this analysis of the M&A risk reporting, I focus on mandatory risk reporting in Item 1A of the 10-K filing. The small sample of this paper, which allows the reading and manual coding of the complete M&A risk

reporting, provides detailed insights into the motivations for disclosing M&A risk factors. The acquirer firms report 11,697 M&A risk factors, which they describe in 5,159 sentences.

This paper contributes to disclosure research and M&A research in two ways. First, it advances our understanding of how the risk level determines risk reporting (Heinle & Smith, 2017; Jorgensen & Kirschenheiter, 2003). Consistent with the transparency motivation, a higher risk level encourages managers to increase both the risk reporting quantity and the risk reporting quality in this particular setting, which is characterized by shareholders' awareness of the managers' private knowledge. The acquirer firm's managers will disclose more M&A risk factors if the target firm is relatively large and from a foreign country, a relatively large amount of the purchase price is allocated to goodwill, and the M&A intensity is high. The M&A risk level is associated with the M&A risk reporting quantity at the four levels of analysis to a varying extent. As recommended by prior risk reporting research (Beretta & Bozzolan, 2004; Miihkinen, 2012), this paper also explores the M&A risk reporting quality. In addition to the M&A risk reporting quantity, the M&A risk reporting quality reflects the M&A risk reporting depth and width. The M&A risk level in terms of a larger amount of goodwill and higher M&A intensity explains the variations in the M&A risk reporting quality. Second, this paper contributes to M&A research (e.g., Cartwright & Schoenberg, 2006; Ferreira et al., 2014). It examines the risks associated with a strategic management decision (i.e., the M&A). Although prior research has emphasized the riskiness of M&As, a comprehensive overview of M&A risk factors is missing. Based on the content analysis of M&A risk reporting, this paper provides insights into the M&A risk factors that are highlighted by the management. The design of an M&A and the integration of the target firm tend to be particularly risky. This paper's coding scheme, which builds on four different levels of analysis, can be transferred to examine how firms adapt corporate disclosures in response to other strategic management decisions.

The remainder of this paper proceeds as follows. In Section 2, I discuss the theoretical underpinnings, introduce the risk reporting guidelines, review the literature on risk reporting, and develop the hypotheses. I address the sample selection and the research design in Section 3. I present the results of the empirical analyses in Section 4. In Section 5, I discuss the conclusions and the limitations of the paper.

2. Theoretical framework and related empirical research

2.1. Mergers & acquisitions and risk

The sociology, strategic management, economics, finance, and accounting literature has widely used the concept of risk (Lupton, 1999; Miller, 1992). Risk has usually been defined as “any opportunity or prospect, or any hazard, danger, harm, threat or exposure, that has already impacted upon the company or may impact upon the company in the future” (Linsley & Shrides, 2006, p. 389). This definition waives the distinction between “risk,” which is measurable, and “uncertainty,” which is immeasurable (Knight, 1921). While risks within the meaning of this definition may affect the firm positively or negatively (Linsley & Shrides, 2006), risk has negative connotations for most practitioners (Schrand & Elliott, 1998). For the purpose of this paper, I focus on practitioners’ understanding of risk. The reporting of risk factors in Item 1A of the 10-K filing, examined in this paper, also refers only to the potential adverse outcomes (Campbell et al., 2014; Securities and Exchange Commission, 2005).

Because M&As are the focus of this analysis, this paper identifies risks that occur in connection with M&As. Following the prior literature (e.g., Frynas & Mellahi, 2015; Miller, 1992), it distinguishes different levels of analysis to categorize the M&A risk factors. Managers may encounter the M&A risk factors at the levels of the macro-environment, industry, firm, and M&A itself. The macro-environmental risks have an impact on all firms, albeit to varying degrees. They include risk factors associated with the political, economic, social,

technological, environmental, and legal environments (Aguilar, 1967; Lynch, 2006). The industry risks affect all the firms within the same industry. Building on the five forces analysis by Porter (1980), this paper distinguishes between the industry risks that primarily arise from a firm's relationships with its competitors, customers, and suppliers.² The firm-specific risks incorporate financial and non-financial risk factors (e.g., Linsley & Shrives, 2006). The risks related to an M&A concern its initiation and implementation. Appendix A presents a detailed categorization of M&A risk factors, which builds on the distinctions of the four different levels of analysis and provides examples of the M&A risk factors from the content analysis (see Section 3.2.2).

2.2. Theoretical framework

Because M&As are strategic management decisions that are likely to change a firm's risk profile considerably in terms of uncertainty about the combined firm's future cash flows (FASB 2001; Shalev, 2009), managers may need to revisit the firm's risk reporting in such a situation. During due diligence, managers acquire private information about the riskiness of M&As (Cullinan et al., 2004; Rosenbloom, 2002). Such information is also useful for shareholders in valuing the combined firm's future prospects. Agency theory suggests that the interests of the managers do not always coincide with those of the shareholders (Jensen & Meckling, 1976). While managers disclose favorable information, they prefer to withhold unfavorable information (e.g., risk factors). Shareholders may interpret missing information as unfavorable information if they know that the managers have acquired private information (Verrecchia, 2001). Corporate disclosure can solve the resultant adverse selection problem (Akerlof, 1970). Managers would therefore need to share all the private information about the M&A risk factors to distinguish their M&A from other less favorable ones (full disclosure

² Porter (1980) considered substitute products as well as actual and potential competitors as characteristics of a firm's competitive environment. When developing the coding scheme for this paper, I did not find any firms that mentioned risk factors related to substitute products or differentiated between risk factors involving actual and potential competitors.

equilibrium; Grossman, 1981; Milgrom, 1981). In reality, such full disclosure equilibria are less likely to occur (Beyer, Cohen, Lys, & Walther, 2010).

Dye (1986) suggested that shareholders must expect partial disclosure in situations in which the managers are endowed with not only public but also private information (i.e., due diligence in this setting). Some researchers have examined risk reporting analytically (Heinle & Smith, 2017; Jorgensen & Kirschenheiter, 2003; Lin, 2010). Jorgensen and Kirschenheiter (2003) identified a partial disclosure equilibrium. They argued that, if risk reporting perfectly reveals the risk level and increases the shareholder uncertainty about the risk exposure, managers will follow a less transparent risk reporting policy. The opaqueness motivation suggests that managers exercise discretion in disclosing private information about the M&A risk factors.

Providing even some information about the M&A risk level may contribute to resolving the shareholder uncertainty. Heinle and Smith (2017) suggested that managers may prefer to report noisy information to no information at all. Even noisy risk reporting can help reduce the shareholder uncertainty about the risk level. Similarly, Lin (2010) argued that companies report the risk factors voluntarily when a sufficiently large number of similar companies are perceived to have a high risk level. The transparency motivation implies that a change in the risk profile arising from a particular M&A encourages more comprehensive M&A risk reporting. In conclusion, whether the M&A risk level is associated with either more transparent or more opaque M&A risk reporting remains an empirical question.

Risk reporting can be either voluntary or mandatory (Cordazzo, Papa, & Rossi, 2017; Dobler, 2008). Risks, by nature, do not always affect future cash flows, especially if managers have taken the right actions to overcome them. Even when accurately identified, it will be difficult to verify the risk factors *ex post*. Because some discretion is therefore inherent in risk reporting, reporting incentives matter, even in the presence of risk reporting regulation, which can only limit the scope of discretion. In the US, but also in other countries worldwide,

financial accounting standard setters and the Securities and Exchange Commission have enhanced their risk reporting requirements. Dobler et al. (2011, p. 3) concluded that the US risk reporting requirements are “specific, detailed, and [...] complex.” The reporting regulations primarily focus on financial risk factors, but they also, to some extent, concern nonfinancial risk factors. Accounting standards require managers to provide both qualitative and quantitative information on financial risk factors and on related risk management in their notes to the financial statements (e.g., Statement of Financial Accounting Standards 5, 107, 115, and 133). The 10-K filing provides further risk information (e.g., Items 1A and 7A of the 10-K filing). For this paper, I focus on Item 1A of the 10-K filing.³

When reporting risk factors, managers should only provide information on the most critical risk factors rather than listing all the possible ones (SOP 94-6.1). Moreover, they should avoid reporting general risk factors in favor of specific risk factors that apply only to their firm (Item 503 (c) of Regulation S–K, Securities and Exchange Commission, 2005). Thus, they must assess the materiality of each risk factor regularly. By leaving the decision on materiality to managers, risk reporting allows for considerable discretion (Solomon, Solomon, Norton, & Joseph, 2000). This also applies to M&A risk reporting.

2.3. Related empirical research

Risk reporting has received increasing attention from empirical researchers in recent years (for a comprehensive literature review see Elshandidy et al., 2018). Elshandidy et al. (2018) distinguished two main strands of empirical risk reporting research. The first strand of research investigated the consequences of risk reporting (e.g., Abraham & Shrides, 2014; Filzen, 2015; Rajgopal, 1999). Overall, the mainly US-based studies found that the stock

³ Following previous research (e.g., Linsley & Shrides, 2006), I considered the complete annual report for the analysis of the M&A risk reporting. However, the acquirer firms present M&A risk factors only in Item 1A of the 10-K filing. I also considered several dates associated with M&As (i.e., rumor date, announcement date, and completion date). I decided to use the completion date, on which the firm also accounts for the M&A. The majority of firms provide M&A risk reporting only in the case of an M&A.

market considers information about risk factors to be useful. Hope, Hu, and Lu (2016) documented that shareholders consider more specific risk reporting to be useful for their decision-making. Filzen (2015) concluded that the required update of risk reporting in 10-Q filings provides investors with useful information on potential adverse outcomes.

The second strand of research that this paper focuses on investigates the motivations for risk reporting (e.g., Dobler et al., 2011; Elshandidy et al., 2013; Linsley & Shrivess, 2006). Overall, the findings seem to suggest that a firm's risk level is associated with risk reporting. However, the picture that emerges is mixed, as regards the different firm characteristics—a firm's risk level and the quality of a firm's corporate governance⁴—and the conclusions on the transparency and opaqueness motivations for risk reporting.

A firm's risk level can be described by the “classic” firm characteristics (i.e., firm size, profitability, and leverage) and more direct measures of the firm's risk level (e.g., volatility and beta). While the relation between a firm's size and its risk level appears to be less clear (Campbell et al., 2014), a less profitable and more leveraged firm is considered to be riskier. The majority of risk reporting studies has reported a significantly positive coefficient for the association between firm size and risk reporting in explaining risk reporting quantity and quality (e.g., Abraham & Cox, 2007; Dobler et al., 2011; Elshandidy et al., 2015). However, a few studies have reported significantly negative coefficients for firm size (Campbell et al., 2014; Hope et al., 2016). Consistent with the transparency motivation, previous evidence of profitability as a determinant of risk reporting quantity and quality suggests a significantly negative relation (e.g., Campbell et al., 2014; Elshandidy et al., 2015; Miihkinen, 2012). Prior studies have provided inconclusive results for the motivations that explain the association

⁴ Some studies have also found some other firm characteristics (e.g., U.S. dual listing, see Abraham & Cox, 2007; e.g., liquidity, see Elshandidy & Neri, 2015; e.g., market-to-book ratio, see Miihkinen, 2012) to be associated with risk reporting.

between leverage and risk reporting quantity and quality (e.g., Abraham & Cox, 2007; Campbell et al., 2014; Miihkinen, 2012).

A firm's risk can be divided into systematic and unsystematic risk. Prior empirical studies have provided evidence that is consistent with the transparency motivation because they have tended to document a positive association between unsystematic firm risk (e.g., volatility) and risk reporting quantity (e.g., Abraham & Cox, 2007; Campbell et al., 2014; Hope et al., 2016). The previous evidence of systematic risk (e.g., beta) as a determinant of a firm's risk reporting is somewhat ambiguous regarding the motivations (Elshandidy et al., 2013; Elshandidy & Neri, 2015).

A higher quality of a firm's corporate governance contributes to a reduced risk level (e.g., Abraham & Cox, 2007; Elshandidy & Neri, 2015). Previous research has provided inconclusive results regarding the relation between external corporate governance (e.g., Big 4 auditor, share ownership) and risk reporting quantity (e.g., Campbell et al., 2014; Elshandidy & Neri, 2015). Consistent with the opaqueness motivation, firms with worse internal corporate governance—in terms of lower numbers of board members, non-executive board members, and independent board members—are more likely to decrease their risk reporting quantity (e.g., Elshandidy et al., 2013; Elshandidy & Neri, 2015).

The different measures of risk reporting used in various studies can partially explain the somewhat mixed results. The majority of the related empirical studies has focused on the risk reporting quantity (i.e., the number of risk factors or risk-related words or sentences). While most studies have taken a comprehensive approach, a few studies have examined the reporting of a particular category of risk factors (e.g., Dobler et al., 2011). Some of the proposed firm characteristics appear to be better able to explain the reporting of a particular category of risk factors (e.g., leverage for financial risk factors; Dobler et al., 2011). Moreover, some empirical studies have analyzed the properties of risk factors, including the type (i.e., quantitative or qualitative; Miihkinen, 2012), nature (i.e., monetary vs. non-monetary; Lins-

ley & Shrivess, 2006), economic impact (i.e., positive, neutral, or negative; Beretta & Bozzolan, 2004), outlook profile (i.e., actions taken or planned; Beretta & Bozzolan, 2004; Miihkinen, 2012), and other dimensions of risk reporting quality (e.g., risk reporting coverage; Miihkinen, 2012). The firm characteristics cannot always explain the variations in the dimensions of risk reporting quality.

The firm characteristics that explain the voluntary risk reporting quantity differ from those that explain the mandatory risk reporting quantity (e.g., Elshandidy et al., 2013; Elshandidy & Neri, 2015). Interestingly, Elshandidy et al. (2015) found that the variations in the mandatory risk reporting quantity are more sensitive to the variations in a US firm's risk level than the variations in the voluntary risk reporting quantity. Usually, a different set of firm characteristics explains risk reporting in different countries (e.g., Dobler et al., 2011; Elshandidy et al., 2015). Although Dobler et al. (2011) showed that firm size is associated with risk reporting in all of the countries examined, they found a positive coefficient for leverage for the sub-sample of US firms in line with the transparency motivation and a negative coefficient for leverage for the sub-sample of German firms in line with the opaqueness motivation. Interestingly, Campbell et al. (2014) found that US firms that engage a Big 4 auditor increase the risk reporting quantity consistent with the opaqueness motivation, while Elshandidy and Neri (2015) documented that Italian and UK firms that engage a Big 4 auditor decrease the risk reporting quantity consistent with the transparency motivation. Moreover, Elshandidy et al. (2015) found that a country's legal system and its values are associated with risk reporting.

The previous accounting literature on M&As has focused on accounting for M&As and the respective disclosures in the notes to the financial statements (e.g., Ott, Schmidt, & Guenther, 2014; Shalev, 2009). For instance, Shalev (2009) showed that the acquirer firm's managers provide more disclosure in the case of relatively large M&As, consistent with the

transparency motivation, but less disclosure in the case of a relatively large amount of goodwill, consistent with the opaqueness motivation.

2.4. Hypothesis development

This paper aims to analyze the motivations behind the association between the M&A risk level and the M&A risk reporting quantity and quality. Building on the competing theoretical arguments presented in Section 2.2, it remains open to debate whether and how M&A risk reporting reflects the M&A risk level. On the one hand, the transparency motivation suggests that managers increase M&A risk reporting in response to a higher M&A risk level. The provision of more (i.e., higher M&A risk reporting quantity) as well as more detailed (i.e., higher M&A risk reporting quality) information about the M&A risk factors contributes to lower shareholder uncertainty. On the other hand, the opaqueness motivation suggests that managers may refrain from providing extensive M&A risk reporting in terms of quantity and quality to avoid overemphasizing the M&A risk level and to decrease shareholders' perceived uncertainty. In summary, the M&A risk level is expected to be positively (negatively) associated with both M&A risk reporting quantity and quality depending on whether the transparency (opaqueness) motivation prevails. If firms present the same M&A risk factors and do not adapt their M&A risk reporting to the M&A risk level, no association between the M&A risk level and the M&A risk reporting is to be observed (null argument). Following the prior M&A literature (e.g., Cartwright & Schoenberg, 2006; King et al., 2004), this paper relies on the following six M&A characteristics to capture the M&A risk level.

A larger M&A is likely to constitute a more significant event for the acquirer firm and, hence, is considered to be riskier than a relatively smaller M&A (Agrawal & Jaffe, 2001). Larger target firms are harder to integrate (Shimizu, Hitt, Vaidyanath, & Pisano, 2004; Tuch & O'Sullivan, 2007). Moreover, larger target firms are more mature than smaller ones and, thus, their future growth opportunities are more limited (Moeller, Schlingemann, &

Stulz, 2004). Although a larger target firm's cash flow might be less uncertain than a smaller target firm's cash flow, the larger target firm's cash flow has a greater impact on the combined firm's cash flow. These arguments suggest that acquiring a relatively larger target firm increases the M&A risk level. If managers are committed to transparency, I expect a positive association between the relative target firm size and both the M&A risk reporting quantity and the M&A risk reporting quality. Moreover, when acquiring or merging with larger target firms, managers may experience more public pressure to report risk factors. Shalev (2009) showed that managers provide more information in the notes to the financial statements in the case of larger M&As. However, they may prefer opaque M&A risk reporting to avoid increasing the shareholder uncertainty associated with a relatively large target firm size. Thus, I propose the following hypothesis:

H 1: *The relative target firm size is associated with the M&A risk reporting quantity and quality in the United States.*

Privately held target firms are considered to be riskier than publicly listed target firms, mainly because of the nature of their business (Officer, 2007). Moreover, the information that is publicly available about a privately held target firm is more limited than that about a publicly listed target firm. If managers cannot obtain the required information, they may encounter difficulties in assessing the value of a privately held target firm (Fuller, Netter, & Stegemoller, 2002; Hitt, Hoskisson, Johnson, & Moesel, 1996). Conn, Cosh, Guest, and Hughes (2005) argued that the private nature of M&As may also lead to the exchange of more detailed information between the acquirer firm and the target firm, in particular during due diligence. Nevertheless, the uncertainty about the combined firm's future cash flows is expected to be higher for M&As that involve privately held target firms. While M&As that involve publicly listed target firms are subject to comprehensive disclosure requirements from the very beginning, M&As that involve private target firms instead fly below the radar of the public. Consistent with the transparency motivation, the managers may increase the

M&A risk reporting quantity and quality. However, they can exercise more discretion in deciding which M&A risk factors to report and how to report them. More opaque M&A risk reporting avoids drawing attention to the increased M&A risk level associated with privately held target firms. Thus, I formulate the second hypothesis:

H 2: *Private ownership (as opposed to public ownership) of the target firms is associated with the M&A risk reporting quantity and quality in the United States.*

M&As in which more goodwill is acquired are considered to be risky. The purchase price usually includes a premium over the fair value of the target firm's net assets (Johnson & Petrone, 1998). The acquirer firm's managers recognize as goodwill the amount paid in excess of the fair value of the target firm's net assets (SFAS 141). If managers overpay for the target firm, the goodwill will increase. An overpayment may arise from managers acting out of self-interest or from managers making mistakes when valuing the target firm (Morck, Shleifer, & Vishny, 1990; Roll, 1986). Besides overpayment and overvaluation, goodwill reflects the target firm's going concern and expected synergies, the corresponding cash flows of which are more uncertain than those of the identifiable net assets (Johnson & Petrone, 1998). In summary, the M&A risk level is higher for M&As in which a relatively large amount of goodwill is recognized. To increase transparency, managers are expected to provide higher M&A risk reporting quantity and quality in the case of a relatively large amount of goodwill. However, consistent with the opaqueness motivation, Shalev (2009) found that managers provide less M&A-related information in their notes to the financial statements after having recognized more goodwill. Managers may follow such an opaque reporting strategy across all the reporting channels, including M&A risk reporting. Based on these arguments, I propose the third hypothesis:

H 3: *The amount of goodwill relative to the purchase price is associated with the M&A risk reporting quantity and quality in the United States.*

The industry relatedness of the acquirer firm and the target firm influences the M&A risk level. The compatibility of two firms operating in related industries has been argued to outweigh the potential benefits of entering into an unknown business to diversify their risks (Flanagan & O'Shaughnessy, 2003; Hitt, Harrison, & Ireland, 2001; Singh & Montgomery, 1987). The M&As of firms from related industries provide better opportunities for synergies because their existing resources are more valuable and relevant. Such M&As also improve the combined firm's competitive position and thus result in a more stable cash flow (Homberg, Rost, & Osterloh, 2009; Salter & Weinhold, 1978). Overall, prior studies that have examined industry relatedness have provided evidence that such M&As are more successful (Flanagan & O'Shaughnessy, 2003; Kusewitt, 1985; Tuch & O'Sullivan, 2007). Not only are the acquirer firm's managers better able to evaluate the economic benefits of M&As (Flanagan & O'Shaughnessy, 2003), but also the target firm's managers and shareholders are better able to infer the reservation price of the acquirer firm's managers (Roy, 1989). Overall, M&As that involve firms from related industries can be considered to be less risky than M&As that combine firms from different industries. Because general risk reporting already contains information about the risk factors that were relevant to the acquirer firm before an M&A with a firm from a related industry, the information asymmetry between the acquirer firm's managers and its shareholders is expected to be lower for this type of M&A. The mere repetition of previously mentioned risk factors may even create opaqueness with regard to the risk factors that were actually caused by a particular M&A. Consistent with the transparency motivation, the managers should increase the M&A risk reporting quantity and quality for M&As that involve target firms from different industries. Considering these arguments, I formulate the fourth hypothesis:

H 4: *Industry relatedness is associated with the M&A risk reporting quantity and quality in the United States.*

Cross-border M&As are considered to be riskier because differences in national cultures, political systems, and institutional environments add to the difficulties that firms would also experience in domestic M&As (Angwin & Savill, 1997; Kraus, Ambos, Eggers, & Cessinger, 2015; Shimizu et al., 2004). The managers experience more difficulties in learning from and integrating into a foreign target firm, mainly because of cultural and geographical distance as well as distinct organizational cultures and management processes (Bertrand & Zuniga, 2006; Quah & Young, 2005). The risk of entering a foreign market will be high if the managers do not understand the market well (Hitt et al., 1996). Furthermore, foreign target firms are harder to evaluate accurately than domestic target firms because of different accounting standards and institutional environments (Bertrand & Zuniga, 2006; Conn et al., 2005). Managers acknowledge that the failure of cross-border M&As is more likely than that of domestic M&As (Angwin & Savill, 1997; Quah & Young, 2005). However, prior research has not provided unambiguous evidence regarding the performance differences between cross-border M&As and domestic M&As (Eckbo & Thorburn, 2000; Moeller & Schlingemann, 2005). In summary, the M&A risk level is expected to be higher for cross-border M&As than for domestic M&As. On the one hand, managers may increase transparency by providing higher M&A risk reporting quantity and quality for cross-border M&As. On the other hand, they may decide to provide more opaque M&A risk reporting to avoid drawing attention to the higher M&A risk levels arising from a cross-border M&A. These arguments lead to the fifth hypothesis:

H 5: *Cross-border M&As (as opposed to domestic M&As) are associated with the M&A risk reporting quantity and quality in the United States.*

Some acquirer firms follow an active M&A strategy. The M&A risk level is likely to increase in tandem with the number of M&As. Each M&A increases managers' need to process information, which involves searching for, analyzing, and selecting candidate target firms (Hitt et al., 1996). Moreover, managers' span of control increases with each M&A. If

the M&A intensity is high, managers' attention may be diverted from other necessary internal activities (Haspeslagh & Jemison, 1991; Hitt et al., 1996). However, managers who pursue an active M&A strategy may be better aware of the typical M&A risk factors and better prepared to develop the required expertise to overcome them (Angwin & Savill, 1997; Hitt, Harrison, Ireland, & Best, 1998). This probably does not apply to very specific M&A risk factors. The findings of prior research on the relationship between M&A intensity and performance are inconsistent. While Kusewitt (1985) recommended pursuing only one M&A, due to the high M&A risk level associated with high M&A intensity, Fowler and Schmidt (1989) documented that an active M&A strategy can predict the success of M&As. On the one hand, the transparency motivation implies that managers respond to high M&A intensity by increasing the M&A risk reporting quantity and quality. On the other hand, the opaqueness motivation suggests that managers prefer a low M&A risk reporting quantity and quality that does not draw attention to the high M&A risk levels. Consequently, I propose the following hypothesis:

H 6: *The M&A intensity is associated with the M&A risk reporting quantity and quality in the United States.*

3. Research design

3.1. Sample selection

This paper investigates the M&A risk reporting of US firms that acquired or merged with firms between 2005 and 2008. From 2005 onward, the Securities and Exchange Commission (2005) requires all firms to include Item 1A in their 10-K filings to report "speculative or risky" factors (Item 503 (c) of Regulation S-K). The sample period ends in the year of the financial crisis. Table 1 presents the sample selection. I included all the transactions between 2005 and 2008 that are listed in the Bureau van Dijk ZEPHYR database as an acquisition or a merger. I verified that the acquirer firms owned more than 50% of the target firms'

shares after the completion of the M&A. I further restricted the sample to M&As for which the acquirer firm is a publicly listed US firm. I excluded M&As with acquirer firms from the financial services (SIC codes 6000–6999), for which the risk reporting is subject to more specific regulations (Dobler et al., 2011; Elshandidy et al., 2015). To ensure that the acquirer firms provide accounting information about the M&A (i.e., purchase price allocation), I focused on M&As with a minimum deal value of USD 250 million. Thus, the initial sample includes 705 M&As.

[Insert Table 1 here]

I selected 300 M&As, using simple random sampling (Sekaran & Bougie, 2013). Of these transactions, 25 had to be excluded because they were not M&As under SFAS 141. The acquirer firms considered 35 of the M&As to be individually immaterial (SFAS 141.53, IFRS 3.68). I included all 240 M&As for the content analysis. For the regression analysis, I restricted the sample to the 231 M&As for which the necessary data are available (see the discussion in Section 3.2).

[Insert Table 2 here]

Table 2 provides descriptive statistics relating to the final sample of 231 M&As. Of these, 43 M&As were completed in 2005, 60 in 2006, 78 in 2007, and 50 in 2008. Of the acquirer firms, 114 operate in manufacturing, 49 in services, 25 in utilities, and 43 in other industries. While 172 of the target firms operate in the same primary two-digit SIC code industry as the acquirer firm, 59 operate in a different industry. In 187 M&As, the target firms are from the US (domestic M&As). The target firms of the 44 cross-border M&As are located mainly in the UK (12).

The annual report, which includes the purchase price allocation in the notes to the financial statements, is a primary source of M&A-related information for shareholders (Ott et al., 2014; Shalev, 2009). Managers report on the M&A risk factors in Item 1A of the 10-K filing (analysis unit). I obtained the historical 10-K filings from the Securities and Exchange Commission's EDGAR database. Together with a research assistant, I manually collected Item 1A of all the 10-K filings. For content analysis, I considered all the information from Item 1A that was explicitly highlighted as M&A-related risk information (e.g., "Risks Related to the Merger") or referred to M&As within a more general risk factor ("In addition, the success of any acquisitions [...] may depend on [...]"). I excluded the risk factors that refer to a future acquisition of the acquirer firm itself ("Anti-takeover defenses").

3.2. Measuring and analyzing risk reporting

3.2.1. Content analysis

Content analysis is a widely used research method for categorizing text in disclosure research in general and risk reporting research in particular (Beattie & Thomson, 2007; Linsley & Shrivess, 2006). Following Krippendorff (2004), the content analysis involves four steps.

First, I developed a coding scheme based on a broad range of literature. I also considered additional M&A risk factors, which I found in the sample firms' M&A risk reporting. The coding scheme is organized hierarchically, with each lower level having a higher level of detail. Appendix A presents the coding scheme and includes examples of the different M&A risk factors. Moreover, I collected data on the type (i.e., quantitative vs. qualitative), nature (i.e., monetary vs. non-monetary), specificity (i.e., (un)related to a specific M&A), and time horizon (i.e., related to current or future M&A) of the M&A risk factors.

Second, I defined the instance of disclosure (i.e., a group of words containing a single piece of information) as the recording unit (Beattie, McInnes, & Fearnley, 2004; Beattie &

Thomson, 2007). The use of instances of disclosure as recording units mitigates the inevitable subjectivity of coder judgments about different risk factors. Furthermore, the coding of the instances of disclosure enables the counting of more than one risk factor per sentence, paragraph, or page.

Third, I opted for computer-assisted manual coding of the M&A risk reporting, mainly because a human coder can better assess the meaning of the instances of disclosure within a context. The M&A risk factors were coded with 1 when they occurred in M&A risk reporting. The frequency with which a recording unit appears in the analysis unit indicates the importance of the recording unit (Beattie & Thomson, 2007; Krippendorff, 2004). By repeating certain risk factors, managers can emphasize and reinforce such risk-related information. Appendix B summarizes the decision rules for the coding of the M&A risk reporting.

The vast majority of the risk reporting literature has employed quantity indices, which count the number of risk factors (e.g., Dobler et al., 2011; Linsley & Shrides, 2006; Miihkinen, 2012). To measure the M&A risk reporting quantity (*RISK_QUAN*), I counted the number of M&A risk factors mentioned in Item 1A of the 10-K filing. I divided the number of M&A risk factors by the total number of words of Item 1A to control for the influence of the length of Item 1A (Elshandidy et al., 2015; Hope et al., 2016). Following the prior literature (e.g., Frynas & Mellahi, 2015; Miller, 1992), I further differentiated between the number of M&A risk factors at different levels of analysis (i.e., macro-environment (*RISK_QUAN_MACRO*), industry (*RISK_QUAN_INDUSTRY*), firm (*RISK_QUAN_FIRM*), and M&A (*RISK_QUAN_M&A*)). The M&A risk factors at a lower level of analysis (e.g., firm or M&A itself) are much more specific to a particular firm or even M&A, while the M&A risk factors at a higher level of analysis (e.g., macro-environment or industry) apply to different firms, albeit not all firms and not to the same extent.

In the same way that more information cannot be equated with better information, the M&A risk reporting quantity does not necessarily measure the M&A risk reporting quality

(Beretta & Bozzolan, 2004; Miihkinen, 2012). Higher-quality M&A risk reporting provides shareholders with more useful information. Building on the suggestions of prior studies (e.g., Beretta & Bozzolan, 2004, 2008; Miihkinen, 2012), the M&A risk reporting quality (*RISK_QUAL*) is the average of the M&A risk reporting quantity (*RISK_QUAN*) and the M&A risk reporting richness (*RISK_RICH*), which synthesizes the M&A risk reporting depth (*RISK_DEPTH*) and width (*RISK_WIDTH*). The M&A risk reporting depth assesses the information content in terms of the properties of risk factors (Beretta & Bozzolan, 2004; Linsley & Shrives, 2006; Miihkinen, 2012). For this paper, the M&A risk reporting is considered to be more useful if the M&A risk reporting contains more quantitative, or even monetary, information about the M&A risk factors and refers to a specific current M&A. In line with Beretta and Bozzolan (2004), I assigned a value of 2 to the quantitative information about the M&A risk factors and a value of 1 to the qualitative information when measuring the M&A risk reporting type (*RISK_TYPE*). For the M&A risk reporting nature (*RISK_NAT*), I assigned a value of 2 to the monetary information about the M&A risk factors and a value of 1 to the non-monetary information (Bellora & Guenther, 2013). Hope et al. (2016) emphasized the necessity of the specificity of risk reporting. For the M&A risk reporting specificity (*RISK_SPEC*), I differentiated between the M&A risk factors that are related to a specific M&A (i.e., the name of the target firm is given) and those that are not. For the M&A risk reporting time horizon (*RISK_TIME*), I assigned a value of 2 to the M&A risk factors that were related to the current M&As and 1 to those that were related to the future M&As. Building on the studies by Beretta and Bozzolan (2008) and Miihkinen (2012), the M&A risk reporting width (*RISK_WIDTH*) assesses the breadth (*RISK_COV*) and dispersion (*RISK_DIS*) of M&A risk reporting. The M&A risk reporting coverage (*RISK_COV*) is the proportion of the four levels of analysis for which an acquirer firm mentions at least one M&A risk factor. The M&A risk reporting dispersion (*RISK_DIS*) corresponds to the standardized entropy index and measures the dispersion of the M&A risk factors among these four levels of analysis.

A low value for *RISK_DIS* indicates that an acquirer firm concentrates its M&A risk reporting on one level of analysis. Overall, a higher index value indicates that an acquirer firm reveals higher-quality information about M&A risk factors and vice versa. As there is no legally binding minimum reporting requirement for M&A risk factors, all the indices can also take a value of zero. Table 3 summarizes the measurement of the M&A risk reporting quality and its dimensions. Appendix C provides examples of the coding of the M&A risk reporting and the calculation of the measures for the M&A risk reporting quantity and quality.

Fourth, I verified the reliability of the content analysis. Krippendorff (2004) identified three types of reliability: accuracy, reproducibility, and stability. First, I ensured that the coding was in line with a predefined coding scheme. A consistent computer-assisted coding procedure helped to assure high accuracy. Second, the well-specified coding scheme and decision rules contributed to assuring reproducibility. Before the coding, a research assistant and I, an experienced content analyst, coded an initial sample of the M&A risk reporting of ten acquirer firms and then discussed the differences in the individual coding samples. Based on this pretest, I improved the coding scheme and the decision rules. Only I performed the coding of the final sample to assure consistency. Third, I coded the M&A risk reporting of 25 acquirer firms twice in one year. The resultant intra-coder reliability (Krippendorff's $\alpha = 0.963$) indicates a high level of stability.

3.2.2. Regression analysis

To examine the association between the M&A risk level and both the M&A risk reporting quantity and quality, I employed the Tobit regression analysis for the following equation. Although 231 acquirer firms reported risk factors, 15 of them did not report any M&A risk factors. Therefore, these acquirer firms appear to have deliberately chosen not to report the M&A risk factors. Moreover, both dependent variables *RISK_QUAN* and *RISK_QUAL* were slightly left-censored at zero. Thus, a censored regression model (e.g., the Tobit regres-

sion model) was required to avoid biased and inconsistent parameter estimates, which can be caused by an ordinary least squares regression model (Greene, 2011).⁵ Some prior risk reporting studies have also applied Tobit regression models (e.g., Abraham & Cox, 2007; Miihkinen, 2012). Because some acquirer firms were included in the sample in more than one year, the standard errors were clustered at the level of the acquirer firm.

$$RISK_QUAN_{i,t} \tag{1}$$

$$\begin{aligned} &= b_0 + b_1 REL_SIZE_{i,t-1} + b_2 PUBLIC_{i,t-1} + b_3 GOODWILL_{i,t} \\ &+ b_4 RELATED_{i,t-1} + b_5 XBORDER_{i,t-1} + b_6 AQ_INT_{i,t-1} \\ &+ b_7 A_PROF_{i,t-1} + b_8 A_LEV_{i,t-1} + b_9 A_SIZE_{i,t-1} + b_{10} A_NEWS_{i,t-1} \\ &+ b_{11} A_COMPLEX_{i,t-1} + b_{12} A_VOLA_{i,t-1} + b_{13} A_BETA_{i,t-1} \\ &+ b_{14} A_BD_SIZE_{i,t-1} + b_{15} A_BD_NON_{i,t-1} + b_{16} A_BD_IND_{i,t-1} \\ &+ b_{17} A_BIG4_{i,t-1} + b_{18} SHARES_{i,t-1} + \sum_j^J f_j IND_i + \sum_k^K g_k YEAR_i \end{aligned}$$

$$RISK_QUAL_{i,t} = c_0 + c_1 REL_SIZE_{i,t-1} + c_2 PUBLIC_{i,t-1} + c_3 GOODWILL_{i,t-1} \tag{2}$$

$$\begin{aligned} &+ c_4 RELATED_{i,t-1} + c_5 XBORDER_{i,t-1} + c_6 AQ_INT_{i,t-1} \\ &+ c_7 A_PROF_{i,t-1} + c_8 A_LEV_{i,t-1} + c_9 A_SIZE_{i,t-1} + c_{10} A_NEWS_{i,t-1} \\ &+ c_{11} A_COMPLEX_{i,t-1} + c_{12} A_VOLA_{i,t-1} + c_{13} A_BETA_{i,t-1} \\ &+ c_{14} A_BD_SIZE_{i,t-1} + c_{15} A_BD_NON_{i,t-1} + c_{16} A_BD_IND_{i,t-1} \\ &+ c_{17} A_BIG4_{i,t-1} + c_{18} SHARES_{i,t-1} + \sum_j^J m_j IND_i + \sum_k^K n_k YEAR_i \end{aligned}$$

This paper analyzes two alternative proxies for M&A risk reporting, which were developed in Section 3.2.1. The M&A risk reporting quantity (*RISK_QUAN*)—the number of M&A risk factors divided by the total number of words of Item 1A of the 10-K filing—is the dependent variable in equation (1).⁶ In equation (2), the dependent variable is the M&A risk

⁵ The results of the Tobit regressions reported in Sections 4.2 and 4.3 are widely consistent with the unreported results for the ordinary least squares regressions.

⁶ As alternative proxies for *RISK_QUAN*, I examined the natural logarithm of the number of M&A risk factors +1, the number of M&A risk factors relative to the total number of the sentences, and the standardized measures. All of these proxies were strongly correlated with *RISK_QUAN*. Unreported results for these proxies indicate consistency with the results presented for *RISK_QUAN*.

reporting quality (*RISK_QUAL*), which corresponds to the average of the M&A risk reporting quantity (*RISK_QUAN*) and the M&A risk reporting richness (*RISK_RICH*).⁷

To test the hypotheses developed in Section 2.4, the equations include the following M&A characteristics as proxies for the M&A risk level: (a) the size of the target firm relative to the acquirer firm (H 1: *REL_SIZE*), (b) a dummy variable for the private ownership of the target firm (H 2: *PRIVATE*), (c) the proportion of the target firm's purchase price allocated to goodwill (H 3: *GOODWILL*), (d) the industry relatedness of the acquirer firm and the target firm based on common two-digit SIC codes (H 4: *RELATED*), (e) a dummy variable for a cross-border M&A (H 5: *XBORDER*), and (f) the M&A intensity measured as the acquirer firm's net assets from M&As divided by the total assets (H 6: *AQ_INT*). If the transparency (opaqueness) motivation explains M&A risk reporting, I expect a significantly positive (negative) coefficient for *REL_SIZE*, *PRIVATE*, *GOODWILL*, *XBORDER*, and *AQ_INT* as well as a significantly negative (positive) coefficient for *RELATED*.

The equations include several acquirer firm characteristics, which control for the pre-existing risk level and the quality of the corporate governance, as identified by previous empirical literature (see Section 2.3). Firms with sound financial performance are less risky and more likely to have the necessary resources to implement risk reporting systems. The previous evidence suggests a negative relation between profitability and a firm's risk reporting activities (e.g., Campbell et al., 2014; Elshandidy et al., 2015; Miihkinen, 2012). The return on assets measures profitability (*A_PROF*). The risk level of financially distressed acquirer firms is higher. The previous empirical results for leverage (*A_LEV*), measured using long-term debt divided by total assets in this paper, as a determinant of risk reporting are mixed

⁷ As an alternative proxy for *RISK_QUAL*, I focused on the M&A risk reporting richness (*RISK_RICH*), which is a function of the M&A risk reporting depth (*RISK_DEPTH*) and width (*RISK_WIDTH*). Unreported results indicate consistency with the results presented for *RISK_QUAL*.

(Dobler et al., 2011; Linsley & Shrives, 2006).⁸ Large firms are more likely to have more effective risk reporting processes and procedures in place (Ding, Jia, Qu, & Wu, 2015). Previous studies have shown that firm size (*A_SIZE*), measured by the natural logarithm of the market capitalization, is associated with risk reporting (Elshandidy et al., 2018).⁹ Media coverage (*A_NEWS*), measured as the natural logarithm of the number of newspaper articles, newswires, and press releases, controls for risks arising from the firm's visibility.¹⁰ Because business complexity (*A_COMPLEX*), measured as the natural logarithm of the number of product segments, is positively associated with the disclosure of material weaknesses (Ge & McVay, 2005), it serves as another control variable for the pre-existing risk level.¹¹ As more direct measures of the pre-existing risk level for the acquirer firm, I controlled for unsystematic risk measured using volatility (*A_VOLA*) and systematic risk measured using beta (*A_BETA*). Acquirer firms with a higher pre-existing risk level are more likely to provide comprehensive M&A risk reporting and, thus, hide other pre-existing risk factors than acquirer firms with a lower pre-existing risk level. Prior literature has found that the quality of a firm's corporate governance explains variations in risk reporting (e.g., Abraham & Cox, 2007; Elshandidy & Neri, 2015). To capture the internal governance characteristics, I considered the natural logarithm of the total number of board members (*A_BD_SIZE*), the number of non-executive board members relative to the total number of board members (*A_BD_NON*), and the number of independent board members relative to the total number of

⁸ Alternative proxies (i.e., total liabilities or total debt divided by total assets) yielded widely consistent results.

⁹ Considering the acquirer firm's total assets as an alternative proxy, I found similar results for *A_SIZE*.

¹⁰ Alternative proxies (i.e., the number of newspaper articles or press releases) yielded widely consistent results.

¹¹ The natural logarithm of the number of geographic segments as an alternative proxy yielded consistent results.

board members (*A_BD_IND*) as control variables.¹² With regard to the external governance characteristics, I controlled for the engagement of a Big 4 auditor (*A_BIG4*). Finally, I controlled for the use of shares as a method of payment (*SHARES*).¹³ If the acquirer firm's managers overpay, the target firm's shareholders will be forced to share part of the risk (Conn et al., 2005).

Previous research has noted that industry membership affects the risk level as well as a firm's reporting decisions (Elango, 2010; Goddard, Tavakoli, & Wilson, 2009; Lajili & Zéghal, 2005). An industry dummy variable (*IND_i*) was coded one if an acquirer firm's primary two-digit SIC code belongs to a specific SIC code division and zero otherwise. I included year dummy variables (*YEAR_j*) to consider the macroeconomic developments (e.g., the differences in the general risk level during the sample period).

[Insert Table 3 here]

Table 3 summarizes the definitions and measurements of all the variables. All the control variables were measured in the fiscal year prior to the M&A. I manually collected the data on M&A risk reporting, M&A accounting (i.e., the purchase price allocation), and corporate governance from the acquirer firm's 10-K filings. All the other variables are based on data from the databases DATASTREAM, WORLDSCOPE, and LEXISNEXIS.

Table 4 provides descriptive statistics for all the variables. The mean of *RISK_QUAN* is 0.010, which means that the acquirer firms mention one M&A risk factor per 100 words in Item 1A of the 10-K filing. The mean of *RISK_QUAL*, which can range from 0 (for poor

¹² Alternative proxies (i.e., the total number of board members, the number of non-executive board members, and the number of independent board members) yielded widely consistent results. Other variables capturing internal governance, such as the chairman of the board also being the CEO (CEO duality), the chairman being a former CEO, and the CEO being a member of the board, did not affect the results.

¹³ Alternative proxies (e.g., a mixture of cash and shares payments) yielded widely consistent results.

M&A risk reporting quality) to 1 (for high M&A risk reporting quality), is 0.175. On average, the natural logarithm of the target firm's purchase price corresponds to 44.1% of the natural logarithm of the acquirer firm's market capitalization (*REL_SIZE*). More than half of the target firms are private ownership firms (the mean of *PRIVATE*: 52.8%). On average, 50.7% of the purchase price is allocated to *GOODWILL*, and, on average, the target firm and the acquirer firm have 52.0% of the two-digit SIC codes in common. Only 19.0% of the M&As are cross-border M&As (*XBORDER*). On average, the acquirer firm's net assets from prior M&As represent 4.6% of its total assets (*AQ_INT*).

[Insert Table 4 here]

4. Results

4.1. Descriptive results

The sample firms reported on the M&A risk factors in Item 1A of the 10-K filing. Although all 231 sample firms conducted an M&A, 15 firms did not mention the M&A risk factors. Thus, I focused on the remaining 216 firms for the descriptive results. The average sample firm subdivides Item 1A into 23.73 sections. Each of these sections deals primarily with one risk category. This paper focuses on 15.60% of such sections, in which the sample firms refer explicitly to the M&A.

The average sample firm described 54.15 M&A risk factors in 23.88 sentences or 617.33 words. In addition to the M&A risk factors mentioned by many firms, a large number of risk factors occurred only a few times. The number of risk factors varies between a minimum of one and a maximum of 195. The high variation may reflect the varying M&A risk levels.

Table 5 provides a detailed overview of the M&A risk factors and categories. Appendix A contains examples for each category of M&A-related risk factors. It should be no surprise that nearly every acquirer firm discussed risk factors at the level of M&A (99.07% of the acquirer firms; 18.80 risk factors), such as risks in connection with the integration of an M&A (7.93) and the realization of the expected benefits (3.69). 98.61% of the acquirer firms revealed firm-specific risks resulting from M&As (27.56). Financial risks are a major firm-specific risk category (17.26). 67.13% of the acquirer firms described industry risks (3.42), and only 57.41% reported macro-environmental risk factors (2.83) in connection with M&As. The acquirer firms mainly focused on the identification and description of the M&A risk factors but did not explain how they intended to overcome them.

[Insert Table 5 here]

Shareholders appreciate quantitative information about the impact of a risk factor (Schrand & Elliott, 1998). However, it appears to be difficult to quantify the M&A risk factors monetarily. Only 1.93% of the M&A risk factors are somehow quantified, of which 73.60% of the factors are in monetary terms (e.g., “we had \$455.7 million of goodwill”). The managers might have decided not to repeat such information if it was already available in other sections of the 10-K filing. Shareholders demand specific and detailed risk information (Solomon et al., 2000). Of the M&A risk factors, 70.66% refer to the current M&As and 29.34% to the future M&As. The acquirer firm’s managers associated 58.10% of the M&A risk factors with specific M&As and 41.90% with M&As in general. Acquirer firms that presented a list of risk factors used a set of boilerplates such as “a material adverse effect on our business” (43 times) or “loss of key employees” (29). Sample firms with more than one M&A identified the same M&A risk factors in connection with all the different M&As. Shareholders perceive such symbolic reporting as not being very useful for their decision-

making (Abraham & Shrikes, 2014; Schrand & Elliott, 1998). If a risk factor is specific to an M&A, the acquirer firm typically devotes a complete section to this M&A risk factor. For instance, Sprint discussed the risk of the merger with Nextel to qualify as a tax-free M&A (Sprint Nextel Corp., 2006).

4.2. Regression results

[Insert Table 6 here]

Table 6 presents the correlation matrix for the total sample of 231 acquirer firms. The two proxies for M&A risk reporting quantity and quality are correlated ($r_{BP}(RISK_QUAN; RISK_QUAL) = 0.581$). Consistent with the transparency motivation, the relative target firm size is positively associated with the M&A risk reporting quantity (H 1: $r_{BP}(RISK_QUAN; REL_SIZE) = 0.298$) and quality (H 1: $r_{BP}(RISK_QUAL; REL_SIZE) = 0.139$). Similarly, the amount of goodwill relative to the purchase price is positively related to both M&A risk reporting quantity (H 3: $r_{BP}(RISK_QUAN; GOODWILL) = 0.177$) and M&A risk reporting quality (H 3: $r_{BP}(RISK_QUAL; GOODWILL) = 0.128$). The positive correlation between the M&A intensity and the M&A risk reporting quality (H 6: $r_{BP}(RISK_QUAL; AQ_INT) = 0.154$) is also in line with the transparency motivation. Interestingly, the positive correlation of industry relatedness with both the M&A risk reporting quantity (H 4: $r_{BP}(RISK_QUAN; RELATED) = 0.146$) and the M&A risk reporting quality (H 4: $r_{BP}(RISK_QUAL; RELATED) = 0.128$) is consistent with the opaqueness motivation.

[Insert Table 7 here]

Table 7 presents the results of the Tobit regression analyses based on the total sample of 231 acquirer firms. First, the M&A risk reporting quantity (*RISK_QUAN*) regression (1) is overall significant (F -stat: 5.548, $p < 0.01$). Neither the correlation matrix (see Table 6) nor the variance inflation factors (see Table 7) indicate severe issues with multicollinearity for the regression model.¹⁴

For the explanatory variables of interest, Table 7 reports not only the coefficient estimates to assess the statistical significance but also the average marginal effects to assess the economic significance. The relative size of the target firm is positively associated with the M&A risk reporting quantity (H 1: *REL_SIZE*, $p < 0.01$).¹⁵ Given that the average marginal effect of the relative target firm size is 0.0290 and its standard deviation is 0.066, a one-standard-deviation increase in the relative target firm size is associated with a 19.90% (= $0.0290 \times 0.066 / RISK_QUAN$ sample mean of 0.010) increase in the M&A risk reporting quantity. This result suggests that the relative target firm size is an economically significant determinant of the M&A risk reporting quantity. Prior research has indicated that a relatively larger target firm is harder to integrate than a smaller one (Shimizu et al., 2004). Consistent with the transparency motivation, the managers appear to have been motivated to disclose more M&A risk factors to explain the resultant increase in the M&A risk level to their shareholders. This result is also in line with that documented by Shalev (2009) for M&A-related information in the notes to the financial statement. The amount of the purchase price allocated to goodwill is also positively associated with the M&A risk reporting quantity (H 3: *GOODWILL*, $p < 0.01$).¹⁶ The average marginal effect of *GOODWILL* indicates that a one-standard-deviation increase in the amount of the purchase price allocated to goodwill is asso-

¹⁴ The highest variance inflation factor is well below 10. The exclusion of one of the two highly correlated variables (*A_SIZE* and *A_NEWS*) reduces the highest variance inflation factor to 2.187 or 2.356.

¹⁵ The (unreported) results for alternative proxies (e.g., the logarithm of the purchase price, the amount of total assets, or the net tangible assets recognized in the purchase price allocation) are consistent.

¹⁶ Intangible assets are also considered to be riskier than tangible assets. The amount of the purchase price allocated to intangible assets and goodwill as an alternative proxy yielded consistent results (unreported).

ciated with a 15.13% ($= 0.0048 \times 0.301 / 0.010$) increase in the M&A risk reporting quantity. The amount of goodwill relative to the purchase price seems to have an economically significant impact on the M&A risk reporting quantity. In contrast to separately identifiable assets and liabilities, the combined firm's future cash flows resulting from goodwill are more uncertain (Johnson & Petrone, 1998). Moreover, the goodwill impairment test offers considerable discretion to managers. Because shareholders are aware of the resulting higher M&A risk level, managers tend to increase the transparency and disclose more M&A risk factors to explain the influence of the M&A on the combined firm's risk profile. However, the willingness to be transparent or opaque not only influences the M&A risk reporting quantity but may already have influenced the recognition of goodwill. Interestingly, Shalev (2009) showed that they tend to reduce the M&A-related information in the notes to the financial statement in the case of a relatively large amount of goodwill. Consistent with the transparency motivation, *XBORDER* is positively associated with the M&A risk reporting quantity (H 5, $p < 0.10$). The corresponding average marginal effect suggests that the origin of the target firm has an economic impact on the M&A risk reporting quantity. Selecting a foreign target firm instead of a domestic one (a change from 0 to 1) increases the M&A risk reporting quantity by 16.55% ($= 0.0016 / 0.010$). If the country of origin of the target firm differs from that of the acquirer firm, managers tend to mention a higher number of M&A risk factors. Higher M&A intensity in the previous year is associated with a higher M&A risk reporting quantity (H 6: *AQ_INT*, $p < 0.01$).¹⁷ The average marginal effect of *AQ_INT* confirms the economic significance of this result. A one-standard-deviation increase in the M&A intensity is associated with a 10.27% ($= 0.0114 \times 0.087 / 0.010$) increase in the M&A risk reporting quantity. Higher M&A intensity may divert the managers' attention from other necessary activities and thus increase the M&A risk level. To reduce the shareholder uncertainty, managers tend to im-

¹⁷ The results for *AQ_INT* are robust to using the number of M&As as an alternative proxy.

prove the transparency by increasing the M&A risk reporting quantity. More experienced managers, who are better able to anticipate the risks that are usually associated with M&As, may be more likely to identify and report such M&A risk factors. The coefficients for *REL_SIZE*, *GOODWILL*, *XBORDER*, and *AQ_INT* indicate that the transparency motivation prevails.

Interestingly, consistent with the opaqueness motivation, acquirer firms reported significantly more M&A risk factors if the industries of the target firm and the acquirer firm are more closely related (H 4b: *RELATED*, $p < 0.05$).¹⁸ The average marginal effect of *RELATED* suggests that a one-standard-deviation increase in industry relatedness is associated with a 10.89% ($= 0.0028 \times 0.373 / 0.010$) increase in the M&A risk reporting quantity. This result supports the economic significance of industry relatedness as a determinant of the M&A risk reporting quantity. Prior literature has suggested that the M&A risk level is lower for M&As of firms from related industries due to the better competitive position of the combined firm and hence more stable cash flows (Flanagan & O'Shaughnessy, 2003; Hitt et al., 2001). Whereas acquirer firms repeated some of the well-known risk factors in their M&A risk reporting in the case of an M&A with a target firm from a related industry, they did not expand the risk reporting in the case of an M&A with a target firm from a different industry, for which most risk factors would probably be new for the shareholders. The opaqueness motivation appears to prevail. However, the acquisition of a target firm operating in a similar industry also increases the dependency of the combined firm's future cash flows on this industry and its inherent risk. Moreover, in the M&As of firms from related industries, the M&A risk level may increase because the target firms' managers and shareholders may demand a higher premium and the acquirer firms' managers can be driven to pay the reservation price (Flanagan & O'Shaughnessy, 2003; Roy, 1989). These arguments may also explain why

¹⁸ Alternative proxies based on one-, three-, or four-digit SIC code industries yielded similar results (unreported).

managers tend to report more M&A risk factors in the M&As of firms from related industries.

The M&A risk reporting quantity does not depend on the target firm ownership (H 2a/b: *PRIVATE*, $p > 0.10$). In contrast to the previous results for risk reporting (e.g., Linsley & Shrivess, 2006), managers appear to be inclined to improve transparency and adapt, at least in part, the M&A risk reporting quantity to the M&A risk level.

Second, the *F*-stat for the M&A risk reporting quality (*RISK_QUAL*) regression (2) amounts to 3.210. Similar to the results of the M&A risk reporting quantity regression, I found positive and significant coefficients for two out of the six hypotheses: *GOODWILL* (H 3: $p < 0.01$) and *AQ_INT* (H 6: $p < 0.01$). Taking into account the average marginal effect of *GOODWILL* of 0.0535 and its standard deviation of 0.3013, a one-standard-deviation increase in the amount of the purchase price allocated to goodwill is associated with a 9.24% (= $0.0535 \times 0.301 / \text{RISK_QUAL sample mean of } 0.175$) increase in the M&A risk reporting quality. Further, the average marginal effect of *AQ_INT* indicates that a one-standard-deviation increase in the M&A intensity is associated with a 7.43% (= $0.1498 \times 0.087 / 0.175$) increase in the M&A risk reporting quality. These associations seem to be not only statistically significant but also economically significant. As the transparency motivation suggests, managers tend to improve the M&A risk reporting quality in response to a high M&A risk level. The null results for four of the six hypotheses indicate that the M&A risk level does not always encourage managers to adapt their M&A risk reporting quality. However, it must be noted that these results do not support the opaqueness motivation either. Overall, managers tend to extend the M&A risk reporting in terms of quantity but less often in terms of quality in response to a higher M&A risk level. These results also suggest that the M&A risk reporting quantity and quality are related but not identical theoretical constructs.

The results for the control variables refine our understanding of the motivations for M&A risk reporting. In contrast to prior risk reporting research (e.g., Campbell et al., 2014;

Elshandidy et al., 2015; Miihkinen, 2012), more profitable and thus less risky acquirer firms appear to report more M&A risk factors of higher quality ($A_PROF: p < 0.05$). This paper found a negative association between leverage and M&A risk reporting quantity ($A_LEV: p < 0.01$). Less leveraged and thus less risky acquirer firms appear to provide more information about the M&A risk factors. The negative coefficient for A_NEWS in the M&A risk reporting quantity regression (1) suggests that more visible and thus less risky acquirer firms report fewer M&A risk factors ($A_NEWS: p < 0.01$). Higher volatility that indicates a higher risk level appears to increase the likelihood of providing a higher M&A risk reporting quality ($A_VOLA: p < 0.10$). Acquirer firms with a lower number of board members tend to provide a higher M&A risk reporting quality ($A_BD_NON: p < 0.05$). Acquirer firms with a larger proportion of non-executive board members disclose fewer M&A risk factors ($A_BD_NON: p < 0.01$). Although acquirer firms for which the annual reports are audited by a Big 4 auditor are regarded as being less risky, they are more likely to report M&A risk factors ($A_BIG4: p < 0.01$).

While many shareholders are unaware of the specific risks discussed in general risk reporting, they are aware of the high riskiness of M&As. Not only may an M&A attract greater attention, but it may also create considerable uncertainty about the combined firm's future cash flows. The shareholders, in turn, expect managers to know the M&A risk levels and develop appropriate strategies to overcome them. By using M&A risk reporting to increase the transparency, the managers can convince their shareholders that they are aware of the M&A risk level. While prior research has suggested that managers prepare more symbolic than substantive risk reports (Abraham & Shrides, 2014), they appear to adapt their M&A risk reporting to the specificities of an M&A. Rather than general risk factors, managers appear to present the risk factors that apply only to the specific M&A. They also improve the M&A risk reporting quality in response to a high M&A risk level. Overall, in line with the transparency motivation, managers tend to provide more substantive M&A risk reporting. An

externally observable, risk-inducing event (e.g., an M&A) appears to contribute to more useful risk reporting, mainly because shareholders expect managers to revisit their risk reporting following such an event.

4.3. Additional analyses

In Section 3.2, I defined the M&A risk reporting quality (*RISK_QUAL*) as a function of the M&A risk reporting quantity (*RISK_QUAN*) and richness (*RISK_RICH*). Because the single subdimensions of the M&A risk reporting quality might overlap or cancel each other out, the associations between the M&A risk level and every single subdimension warrant further separate analyses.

The first additional analysis focuses on the subdimensions of *RISK_QUAN*. Managers may name the M&A risk factors that refer to the four different levels of analysis. While the M&A risk factors at a lower level of analysis (e.g., the M&A itself) are primarily the managers' own responsibility, they can more easily push away the responsibility for the M&A risk factors at a higher level of analysis (e.g., macro-environment). Table 8 presents the Tobit regression results for the quantity of M&A risk factors at the levels of the macro-environment (*RISK_QUAN_MACRO*), industry (*RISK_QUAN_INDUSTRY*), firm (*RISK_QUAN_FIRM*), and M&A (*RISK_QUAN_M&A*) as the dependent variables. All four regression models provide overall significant results (F -stat: 2.069–4.835, $p < 0.01$).

[Insert Table 8 here]

Consistent with the transparency motivation, *REL_SIZE* (H 1: $p < 0.10$) and *AQ_INT* (H 6: $p < 0.10$) increase the M&A risk reporting quantity for all four levels of analysis. The corresponding marginal effects also confirm the economic significance of the results at the four different levels of analysis. A one-standard-deviation increase in the relative target firm

size is associated with a 30.53% ($= 0.0020 \times 0.066 / RISK_QUAN_MACRO$ sample mean of 0.0004) increase in the M&A risk reporting quantity at the level of the macro-environment, a 30.57% ($= 0.0023 \times 0.066 / RISK_QUAN_INDUSTRY$ sample mean of 0.0005) increase at the level of the industry, a 25.53% ($= 0.0189 \times 0.066 / RISK_QUAN_FIRM$ sample mean of 0.0048) increase at the level of the firm, and a 9.88% ($= 0.0053 \times 0.066 / RISK_QUAN_M\&A$ sample mean of 0.0035) increase at the level of the M&A itself. A one-standard-deviation increase in the M&A intensity is associated with a 12.07% ($= 0.0006 \times 0.087 / 0.0004$) increase in the M&A risk reporting quantity at the level of the macro-environment, a 17.94% ($= 0.0010 \times 0.087 / 0.0005$) increase at the level of the industry, a 6.83% ($= 0.0038 \times 0.087 / 0.0048$) increase at the level of the firm, and a 14.79% ($= 0.0060 \times 0.087 / 0.0035$) increase at the level of the M&A itself. are inclined to make exposure to the M&A risk level transparent by mentioning a higher number of M&A risk factors. The coefficient for *PRIVATE* is positive and significant for *RISK_QUAN_MACRO* (H 2: $p < 0.10$). The average marginal effect suggests that selecting a private target firm instead of a public one (a change from 0 to 1) strongly increases the M&A risk reporting quantity at the level of the macro-environment by 51.16% ($= 0.0002 / 0.0004$) and thus confirms the economic significance of the result. When acquiring or merging with a privately owned target firm, the managers tend to report more transparently the macro-environmental M&A risk factors that are not within their area of responsibility. In line with the transparency motivation, *GOODWILL*, which reflects the value of the target firm's going concern and expected synergies, is positively associated with the M&A risk reporting quantity in all the regression models but only significantly associated with *RISK_QUAN_FIRM* and *RISK_QUAN_M&A* (H 3: $p < 0.05$), to which the goodwill-related risks actually map into. The average marginal effects of *GOODWILL* indicate that a one-standard-deviation increase in the amount of the purchase price allocated to goodwill is associated with a 13.61% ($= 0.0022 \times 0.301 / 0.0048$) increase in the M&A risk reporting quantity at the level of the firm and even an 18.19% ($= 0.0021 \times 0.301 / 0.0035$) increase at

the level of the M&A. While *XBORDER* is positively associated with the M&A risk reporting quantity in all the regression models, it is only significant in the regressions with *RISK_QUAN_MACRO* and *RISK_QUAN_FIRM* (H 5: $p < 0.10$) as dependent variables. The average marginal effects of *XBORDER* indicate that selecting a foreign target firm instead of a domestic one (a change from 0 to 1) increases the M&A risk reporting quantity at the level of the macro-environment by 52.44% ($= 0.0002 / 0.0004$) and at the level of the firm by 18.14% ($= 0.0009 / 0.0048$) and thus confirm the economic significance. If the target and the acquirer firms are from closely related industries, the acquirer firms report more M&A risk factors at the level of the M&A (H 4b: *RELATED*, $p < 0.01$). The average marginal effect of *RELATED* suggests that a one-standard-deviation increase in the industry relatedness is associated with a 17.07% ($= 0.0016 \times 0.373 / 0.0035$) increase in the M&A risk reporting quantity at the level of the M&A. This result suggests that this association is not only statistically significant but also economically significant. Interestingly, the results of the additional analyses indicate that the managers who know the target firm's industry better, due to higher industry relatedness, tend not to mention more of the industry-related M&A risk factors. However, they tend to mention more of the risks related to the integration of the target and the acquirer firms, the potential synergies, and the financial impact of the M&A on the combined firm. Overall, based on the comparison of the *F*-stat, the proxies for the M&A risk level tend to explain better the reporting of the M&A risk factors at a lower level of analysis (*RISK_QUAN_FIRM* or *RISK_QUAN_M&A*) than a higher one (*RISK_QUAN_MACRO* or *RISK_QUAN_INDUSTRY*). Thus, managers cannot be accused of shifting their responsibility to others by mentioning M&A risk factors that are beyond their control.

To meet shareholders' need for information, managers decide not only which M&A risk factors to report but also how to report them. The second additional analysis examines the subdimensions of the type (*RISK_TYPE*), nature (*RISK_NAT*), specificity (*RISK_SPEC*), and time horizon (*RISK_TIME*) of the M&A risk reporting depth (*RISK_DEPTH*). Table 9

presents the four corresponding Tobit regression models that provide overall significant results (F -stat: 2.763–6.093, $p < 0.01$).

[Insert Table 9 here]

Consistent with the transparency motivation, the indices for each of the four subdimensions of the M&A risk reporting depth increase with *REL_SIZE* (H 1: $p < 0.01$) and *GOODWILL* (H 3: $p < 0.05$). The related average marginal effects also confirm the economic significance of *REL_SIZE* and *GOODWILL* as determinants of the four subdimensions of the M&A risk reporting depth. A one-standard-deviation increase in the relative target firm size is associated with a 20.35% ($= 0.0304 \times 0.066 / RISK_TYPE$ sample mean of 0.0098) increase in the M&A risk reporting type, a 44.53% ($= 0.0026 \times 0.066 / RISK_NAT$ sample mean of 0.0004) increase in the M&A risk reporting nature, a 28.25% ($= 0.0779 \times 0.066 / RISK_SPEC$ sample mean of 0.0181) increase in the M&A risk reporting specificity, and a 20.65% ($= 0.0517 \times 0.066 / RISK_TIME$ sample mean of 0.0164) increase in the M&A risk reporting time horizon. A one-standard-deviation increase in *GOODWILL* is associated with a 15.39% ($= 0.0050 \times 0.301 / 0.0098$) increase in the M&A risk reporting type, a 23.13% ($= 0.0003 \times 0.301 / 0.0004$) increase in the M&A risk reporting nature, a 18.63% ($= 0.0112 \times 0.301 / 0.0181$) increase in the M&A risk reporting specificity, and a 17.58% ($= 0.0096 \times 0.301 / 0.0164$) increase in the M&A risk reporting time horizon. The managers present slightly more quantitative information about the M&A risk factors of specific current cross-border M&As (H 5: *XBORDER*, $p < 0.10$). The average marginal effects of *XBORDER* indicate that the associations are not only statistically significant but also economically significant. Acquiring or merging with a foreign target firm instead of a domestic one (a change from 0 to 1) increases the M&A risk reporting type by 17.09% ($= 0.0017 / 0.0098$), the M&A risk reporting specificity by 20.87% ($= 0.0038 / 0.0181$), and the M&A risk reporting time

horizon by 17.49% ($= 0.0029 / 0.0164$). Given a higher *AQ_INT*, managers report more quantitative information about the M&A risk factors of a specific current M&A (H 6: $p < 0.10$). A one-standard-deviation increase in the M&A intensity is associated with a 9.75% ($= 0.0110 \times 0.087 / 0.0098$) increase in the M&A risk reporting type, a 7.26% ($= 0.0152 \times 0.087 / 0.0181$) increase in the M&A risk reporting specificity, and a 7.94% ($= 0.0150 \times 0.087 / 0.0164$) increase in the M&A risk reporting time horizon. However, acquirer firms with a higher *AQ_INT* are more reluctant to provide monetary information about the M&A risk factors (H 6: $p < 0.10$). A one-standard-deviation increase in the M&A intensity is associated with a 15.46% ($= -0.0007 \times 0.087 / 0.0004$) decrease in the M&A risk reporting nature. However, very few acquirer firms disclose monetary information about the M&A risk factors. If the target and the acquirer firms' industries are more closely related, the managers provide more quantitative information on the M&A risk factors of a specific current M&A (H 4: *RELATED*, $p < 0.05$). The average marginal effects also confirm the economic significance of *RELATED* as a determinant of the M&A risk reporting type, specificity, and time horizon. A one-standard-deviation increase in industry relatedness is associated with a 10.82% ($= 0.0028 \times 0.373 / 0.0098$) increase in the M&A risk reporting type, a 14.70% ($= 0.0071 \times 0.373 / 0.0181$) increase in the M&A risk reporting specificity, and an 11.78% ($= 0.0052 \times 0.373 / 0.0164$) increase in the M&A risk reporting time horizon. Except for *RELATED*, the results suggest that the M&A risk level increases the M&A risk reporting depth in terms of type, nature, specificity, and time horizon.

The third additional analysis investigates the subdimensions of the coverage (*RISK_COV*) and dispersion (*RISK_TIME*) of the M&A risk reporting width (*RISK_WIDTH*). Table 10 presents the overall significant results of the Tobit regressions for the subdimensions of the M&A risk reporting width (F -stat: 2.328–3.130, $p < 0.01$).

[Insert Table 10 here]

Consistent with the transparency motivation, the results suggest that the M&A risk reporting width increases in tandem with the M&A risk level. The M&A risk reporting coverage and dispersion increase with *GOODWILL* (H 3: $p < 0.01$). The average marginal effects of *GOODWILL* confirm the economic significance of the result. A one-standard-deviation increase in *GOODWILL* is associated with an 8.51% ($= 0.2128 \times 0.301 / RISK_COV$ sample mean of 0.753) increase in the M&A risk reporting coverage and a 9.57% ($= 0.1848 \times 0.301 / RISK_DIS$ sample mean of 0.582) increase in the M&A risk reporting dispersion. If a larger amount of goodwill is recognized, the managers do not concentrate on a small number of M&A risk factors but tend to discuss a wide variety of M&A risk factors, occurring at multiple levels of analysis, in their M&A risk reporting. A higher *AQ_INT* appears to require a more dispersed set of M&A risk factors to be reported at multiple levels of analysis (H 6: $p < 0.01$). The average marginal effects indicate that a one-standard-deviation increase in the M&A intensity is associated with a 7.73% ($= 0.6733 \times 0.087 / 0.753$) increase in the M&A risk reporting coverage and a 6.86% ($= 0.4615 \times 0.087 / 0.582$) increase in the M&A risk reporting dispersion. These results confirm the economic significance of the M&A intensity as a determinant of the M&A risk reporting width. When a private target firm is involved, the managers do not concentrate on a certain level of analysis but disclose the M&A risk factors at multiple levels of analysis (H 2: *PRIVATE*, $p < 0.01$). The average marginal effect confirms the economic significance of this result. After acquiring or merging with a private target firm instead of a public one (a change from 0 to 1), the M&A risk reporting dispersion increases by 9.57% ($= 0.0559 / 0.582$).

5. Conclusion

This paper provides new insights into the M&A risk factors that a combined firm faces and the impact of the M&A risk level on the M&A risk reporting quantity and quality.

Nearly all the acquirer firms revealed the M&A risk factors at the levels of the M&A itself and the firm, about two-thirds at the level of industry, and six out of ten at the level of the macro-environment. While the prior research has suggested that risk reporting is more symbolic (Abraham & Shrides, 2014), the results of this paper indicate that managers adapt their M&A risk reporting to the M&A risk level measured through the M&A characteristics. Managers tend to disclose more M&A risk factors if the target firm is relatively large and from a foreign country, a relatively large amount of the purchase price is allocated to goodwill, and the M&A intensity is high. However, they also provide more detailed M&A risk reporting if the target firm is from a related industry. Overall, an externally observable event that increases the risk level appears to result in greater transparency in risk reporting. Shareholders know that managers have access to private information about the M&A risk levels and thus expect them to revisit their risk reporting accordingly. Managers do not appear to exploit their considerable amount of discretion but tend to provide more transparent M&A risk reporting.

This paper contributes to research and practice. First, it documents that the M&A risk reporting quantity and quality reflect the M&A risk level, albeit to varying degrees. When analyzing risk reporting, researchers should control for the existence of other risk-inducing events. Shareholders' awareness of a higher risk level requires improved risk reporting. As suggested by Lin (2010), standard setters should consider refraining from regular in favor of more ad hoc risk reporting requirements. Second, this paper analyzes M&A risk reporting in detail. It provides a comprehensive list of M&A risk factors. Managers are advised to consider these M&A risk factors when planning and managing M&As. This list may be regarded as a starting point for a more detailed analysis of the impact of M&A risk factors. This paper's detailed list can be refined further for the analysis of other risk-inducing events. Moreover, the results suggest that the M&A risk reporting quantity and quality are related but not identical theoretical constructs.

This paper has several limitations that represent future research opportunities. First, the sample period covered the years 2005 to 2008. This period immediately followed the introduction of the new risk reporting requirements and ended in the year of the financial crisis. Considering the dominance of the transparency motivation over the opaqueness motivation shown in this paper, I would expect the additional reporting requirements introduced in the aftermath of the financial crisis to contribute to even more transparent M&A risk reporting. However, this remains an open question for future researchers. Moreover, the financial crisis probably influenced managers' acceptance of a certain risk level and their compliance with risk reporting requirements. Future research may consider examining the variations in these two aspects of risk reporting decisions over time. Another limitation is subjectivity involved in the application of content analysis as a research method. Although subjectivity cannot be eliminated completely, I tried to achieve a high level of reliability. Moreover, I considered a wide range of different measures of risk reporting quantity and quality. However, such measures of reporting ultimately rely on the quantity of reporting (Botosan, 2004). Future researchers who intend to develop new measures of risk reporting quality are advised to consider that risk reporting quantity is a related but not the same theoretical construct. Finally, although I tried to identify the most relevant M&A characteristics as proxies for the M&A risk level, future research may identify additional M&A characteristics that explain the M&A risk level. Despite these limitations, this paper offers new, useful insights into M&A risk factors and the impact of the M&A risk level measured using M&A characteristics on the M&A risk reporting quantity and quality.

References

- Abraham, S., & Cox, P. (2007). Analysing the determinants of narrative risk information in UK FTSE 100 annual reports. *The British Accounting Review*, 39(3), 227-248.
- Abraham, S., & Shrivess, P. J. (2014). Improving the relevance of risk factor disclosure in corporate annual reports. *The British Accounting Review*, 46(1), 91-107.
- Agrawal, A., & Jaffe, J. F. (2001). The post-merger performance puzzle. *Advances in Mergers & Acquisitions*, 1, 7-41.
- Aguilar, F. J. (1967). *Scanning the business environment*. New York: Macmillan.
- Ahmed, Y., & Elshandidy, T. (2016). The effect of bidder conservatism on M&A decisions: Text-based evidence from US 10-K filings. *International Review of Financial Analysis*, 46, 176-190.
- Akerlof, G. A. (1970). The market for "lemons": Quality uncertainty and the market mechanism. *Quarterly Journal of Economics*, 84(3), 488-500.
- Angwin, D., & Savill, B. (1997). Strategic perspectives on European cross-border acquisitions: A view from top European executives. *European Management Journal*, 15(4), 423-435.
- Beattie, V., McInnes, B., & Fearnley, S. (2004). A methodology for analysing and evaluating narratives in annual reports: A comprehensive descriptive profile and metrics for disclosure quality attributes. *Accounting Forum*, 28(3), 205-236.
- Beattie, V., & Thomson, S. J. (2007). Lifting the lid on the use of content analysis to investigate intellectual capital disclosures. *Accounting Forum*, 31(2), 129-163.
- Bellora, L., & Guenther, T. W. (2013). Drivers of innovation capital disclosure in intellectual capital statements: Evidence from Europe. *The British Accounting Review*, 45(4), 255-270.
- Beretta, S., & Bozzolan, S. (2004). A framework for the analysis of firm risk communication. *The International Journal of Accounting*, 39(3), 265-288.
- Beretta, S., & Bozzolan, S. (2008). Quality versus quantity: The case of forward-looking disclosure. *Journal of Accounting, Auditing & Finance*, 23(3), 333-375.
- Bertrand, O., & Zuniga, P. (2006). R&D and M&A: Are cross-border M&A different? An investigation on OECD countries. *International Journal of Industrial Organization*, 24(2), 401-423.
- Beyer, A., Cohen, D. A., Lys, T. Z., & Walther, B. R. (2010). The financial reporting environment: Review of the recent literature. *Journal of Accounting and Economics*, 50(2-3), 296-343.
- Botosan, C. A. (2004). Discussion of a framework for the analysis of firm risk communication. *The International Journal of Accounting*, 39(3), 289-295.
- Campbell, J. L., Chen, H., Dhaliwal, D. S., Lu, H.-M., & Steele, L. B. (2014). The information content of mandatory risk factor disclosures in corporate filings. *Review of Accounting Studies*, 19(1), 396-455.
- Cartwright, S., & Schoenberg, R. (2006). Thirty years of mergers and acquisitions research: Recent advances and future opportunities. *British Journal of Management*, 17(S1), S1-S5.
- Conn, R. L., Cosh, A., Guest, P. M., & Hughes, A. (2005). The impact on UK acquirers of domestic, cross-border, public and private acquisitions. *Journal of Business Finance & Accounting*, 32(5-6), 815-870.
- Cordazzo, M., Papa, M., & Rossi, P. (2017). The interaction between mandatory and voluntary risk disclosure: A comparative study. *Managerial Auditing Journal*, 32(7), 682-714.

- Cullinan, G., Le Roux, J.-M., & Weddigen, R.-M. (2004). When to walk away from a deal. *Harvard Business Review*, 82(4), 96-104, 141.
- Ding, S., Jia, C., Qu, B., & Wu, Z. (2015). Corporate risk-taking: Exploring the effects of government affiliation and executives' incentives. *Journal of Business Research*, 68(6), 1196-1204.
- Dobler, M. (2008). Incentives for risk reporting - A discretionary disclosure and cheap talk approach. *The International Journal of Accounting*, 43(2), 184-206.
- Dobler, M., Lajili, K., & Zéghal, D. (2011). Attributes of corporate risk disclosure: An international investigation in the manufacturing sector. *Journal of International Accounting Research*, 10(2), 1-22.
- Dye, R. A. (1986). Proprietary and nonproprietary disclosures. *Journal of Business*, 59(2), 331-366.
- Eckbo, B. E., & Thorburn, K. S. (2000). Gains to bidder firms revisited: Domestic and foreign acquisitions in Canada. *Journal of Financial and Quantitative Analysis*, 35(1), 1-25.
- Elango, B. (2010). Influence of industry type on the relationship between international operations and risk. *Journal of Business Research*, 63(3), 303-309.
- Elshandidy, T., Fraser, I., & Hussainey, K. (2013). Aggregated, voluntary, and mandatory risk disclosure incentives: Evidence from UK FTSE all-share companies. *International Review of Financial Analysis*, 30, 320-333.
- Elshandidy, T., Fraser, I., & Hussainey, K. (2015). What drives mandatory and voluntary risk reporting variations across Germany, UK and US? *The British Accounting Review*, 47(4), 376-394.
- Elshandidy, T., & Neri, L. (2015). Corporate governance, risk disclosure practices, and market liquidity: Comparative evidence from the UK and Italy. *Corporate Governance: An International Review*, 23(4), 331-356.
- Elshandidy, T., Shrivs, P. J., Bamber, M., & Abraham, S. (2018). Risk reporting: A review of the literature and implications for future research. *Journal of Accounting Literature*, 40, 54-82.
- Ferreira, M. P., Santos, J. C., de Almeida, M. I. R., & Reis, N. R. (2014). Mergers & acquisitions research: A bibliometric study of top strategy and international business journals, 1980–2010. *Journal of Business Research*, 67(12), 2550-2558.
- Filzen, J. J. (2015). The information content of risk factor disclosures in quarterly reports. *Accounting Horizons*, 29(4), 887-916.
- Financial Accounting Standards Board. (2001). *Statement of Financial Accounting Standards No. 141: Business combinations (SFAS 141)*. Norwalk: FASB.
- Flanagan, D. J., & O'Shaughnessy, K. C. (2003). Core-related acquisitions, multiple bidders and tender offer premiums. *Journal of Business Research*, 56(8), 573-585.
- Fowler, K. L., & Schmidt, D. R. (1989). Determinants of tender offer post-acquisition financial performance. *Strategic Management Journal*, 10(4), 339-350.
- Frynas, J. G., & Mellahi, K. (2015). *Global strategic management*. Oxford: Oxford University Press.
- Fuller, K., Netter, J., & Stegemoller, M. (2002). What do returns to acquiring firms tell us? Evidence from firms that make many acquisitions. *Journal of Finance*, 57(4), 1763-1793.
- Ge, W., & McVay, S. (2005). The disclosure of material weaknesses in internal control after the Sarbanes-Oxley Act. *Accounting Horizons*, 19(3), 137-158.
- Goddard, J., Tavakoli, M., & Wilson, J. O. (2009). Sources of variation in firm profitability and growth. *Journal of Business Research*, 62(4), 495-508.
- Greene, W. H. (2011). *Econometric analysis* (7th ed.). London: Prentice Hall.

- Grossman, S. J. (1981). The informational role of warranties and private disclosure about product quality. *Journal of Law and Economics*, 24(3), 461-483.
- Haspeslagh, P. C., & Jemison, D. B. (1991). *Managing acquisitions: Creating value through corporate renewal*. New York: Free Press.
- Heinle, M. S., & Smith, K. C. (2017). A theory of risk disclosure. *Review of Accounting Studies*, 22(4), 1459-1491.
- Hitt, M. A., Harrison, J. S., & Ireland, R. D. (2001). *Mergers and acquisitions: A guide to creating value for stakeholders*. Oxford: Oxford University Press.
- Hitt, M. A., Harrison, J. S., Ireland, R. D., & Best, A. (1998). Attributes of successful and unsuccessful acquisitions of US firms. *British Journal of Management*, 9(2), 91-114.
- Hitt, M. A., Hoskisson, R. E., Johnson, R. A., & Moesel, D. D. (1996). The market for corporate control and firm innovation. *Academy of Management Journal*, 39(5), 1084-1119.
- Homberg, F., Rost, K., & Osterloh, M. (2009). Do synergies exist in related acquisitions? A meta-analysis of acquisition studies. *Review of Managerial Science*, 3(2), 75-116.
- Hope, O.-K., Hu, D., & Lu, H. (2016). The benefits of specific risk-factor disclosures. *Review of Accounting Studies*, 21(4), 1005-1045.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360.
- Johnson, L. T., & Petrone, K. R. (1998). Is goodwill an asset? *Accounting Horizons*, 12(3), 293-303.
- Jorgensen, B. N., & Kirschenheiter, M. T. (2003). Discretionary risk disclosures. *The Accounting Review*, 78(2), 449-469.
- King, D. R., Dalton, D. R., Daily, C. M., & Covin, J. G. (2004). Meta-analysis of post-acquisition performance: Indications of unidentified moderators. *Strategic Management Journal*, 25(2), 187-200.
- Knight, F. H. (1921). *Risk, uncertainty and profit*. Boston: Houghton Mifflin.
- Kraus, S., Ambos, T. C., Eggers, F., & Cesinger, B. (2015). Distance and perceptions of risk in internationalization decisions. *Journal of Business Research*, 68(7), 1501-1505.
- Krippendorff, K. (2004). *Content analysis: An introduction to its methodology* (2nd ed.). Thousand Oaks: Sage.
- Kusewitt, J. B. (1985). An exploratory study of strategic acquisition factors relating to performance. *Strategic Management Journal*, 6(2), 151-169.
- Lajili, K., & Zéghal, D. (2005). A content analysis of risk management disclosures in Canadian annual reports. *Canadian Journal of Administrative Sciences / Revue Canadienne des Sciences de l'Administration*, 22(2), 125-142.
- Lin, S.-W. (2010). Self-reporting mechanism for risk regulation. *Journal of Business Research*, 63(5), 528-534.
- Linsley, P. M., & Shrivies, P. J. (2006). Risk reporting: A study of risk disclosures in the annual reports of UK companies. *The British Accounting Review*, 38(4), 387-404.
- Lupton, D. (1999). *Risk*. London: Routledge.
- Lynch, R. L. (2006). *Corporate strategy*. Harlow, England; New York: FT/Prentice Hall.
- Marshall, A., & Weetman, P. (2007). Modelling transparency in disclosure: The case of foreign exchange risk management. *Journal of Business Finance & Accounting*, 34(5-6), 705-739.
- Miihkinen, A. (2012). What drives quality of firm risk disclosure? The impact of a national disclosure standard and reporting incentives under IFRS. *The International Journal of Accounting*, 47(4), 437-468.
- Milgrom, P. R. (1981). Good news and bad news: Representation theorems and applications. *Bell Journal of Economics*, 12(2), 380-391.

- Miller, K. D. (1992). A framework for integrated risk management in international business. *Journal of International Business Studies*, 23(2), 311-331.
- Moeller, S. B., & Schlingemann, F. P. (2005). Global diversification and bidder gains: A comparison between cross-border and domestic acquisitions. *Journal of Banking & Finance*, 29(3), 533-564.
- Moeller, S. B., Schlingemann, F. P., & Stulz, R. M. (2004). Firm size and the gains from acquisitions. *Journal of Financial Economics*, 73(2), 201-228.
- Morck, R., Shleifer, A., & Vishny, R. W. (1990). Do managerial objectives drive bad acquisitions? *Journal of Finance*, 45(1), 31-48.
- Officer, M. S. (2007). The price of corporate liquidity: Acquisition discounts for unlisted targets. *Journal of Financial Economics*, 83(3), 571-598.
- Ott, C., Schmidt, U., & Guenther, T. (2014). Information dissemination on intellectual capital in mergers and acquisitions: Purchase price allocations, press releases and business press. *Accounting and Business Research*, 44(3), 280-314.
- Perry, J. S., & Herd, T. J. (2004). Reducing M&A risk through improved due diligence. *Strategy & Leadership*, 32(2), 12-19.
- Porter, M. E. (1980). *Competitive strategy: Techniques for analyzing industries and competitors*. New York: Free Press.
- Quah, P., & Young, S. (2005). Post-acquisition management: A phases approach for cross-border M&As. *European Management Journal*, 23(1), 65-75.
- Rajgopal, S. (1999). Early evidence on the informativeness of the SEC's market risk disclosures: The case of commodity price risk exposure of oil and gas producers. *The Accounting Review*, 74(3), 251-280.
- Roll, R. (1986). The hubris hypothesis of corporate takeovers. *Journal of Business*, 59(2), 197-216.
- Rosenbloom, A. H. (2002). *Due diligence for global deal making: The definitive guide to cross-border mergers and acquisitions, joint ventures, financings, and strategic alliances*. Princeton: Bloomberg.
- Roy, A. (1989). Optimal offer strategies in mergers and acquisitions. *Decision Sciences*, 20(3), 591-601.
- Salter, M. S., & Weinhold, W. A. (1978). Diversification via acquisition: Creating value. *Harvard Business Review*, 56(4), 166-176.
- Schrand, C. M., & Elliott, J. A. (1998). Risk and financial reporting: A summary of the discussion at the 1997 AAA/FASB conference. *Accounting Horizons*, 12(3), 271-282.
- Securities and Exchange Commission. (2005). Securities and exchange commission final rule. *Release(33-8591 (FR-75))*.
- Sekaran, U., & Bougie, R. (2013). *Research methods for business: A skill-building approach* (6th ed.). Chichester: Wiley.
- Shalev, R. (2009). The information content of business combination disclosure level. *The Accounting Review*, 84(1), 239-270.
- Shimizu, K., Hitt, M. A., Vaidyanath, D., & Pisano, V. (2004). Theoretical foundations of cross-border mergers and acquisitions: A review of current research and recommendations for the future. *Journal of International Management*, 10(3), 307-353.
- Singh, H., & Montgomery, C. A. (1987). Corporate acquisition strategies and economic performance. *Strategic Management Journal*, 8(4), 377-386.
- Solomon, J. F., Solomon, A., Norton, S. D., & Joseph, N. L. (2000). A conceptual framework for corporate risk disclosure emerging from the agenda for corporate governance reform. *The British Accounting Review*, 32(4), 447-478.
- Sprint Nextel Corp. (2006). Form 10-K for the fiscal year ended December 31, 2005. *Annual Report*.

- Tuch, C., & O'Sullivan, N. (2007). The impact of acquisitions on firm performance: A review of the evidence. *International Journal of Management Reviews*, 9(2), 141-170.
- Verrecchia, R. E. (2001). Essays on disclosure. *Journal of Accounting and Economics*, 32(1-3), 97-180.

Tables

Table 1: Sample selection

Criteria	Specified values	Total
Total number of completed deals		456,361
Deal type	No acquisition or merger	- 270,535
Quoted firms	No listed acquirer firm	- 123,872
Geography	Acquirer firm not from the United States	- 41,749
Total number of M&A transactions with listed acquirer firms from the United States		20,205
Time period	Not completed between 01/01/2005 and 31/12/2008	- 9,646
Deal value (incl. estimates)	Below minimum deal value of USD 250 million	- 9,664
Industry	Finance, insurance and real estate M&A transactions (SIC 60–69)	- 190
Total number of M&A transactions selected		705
Random sample of M&A transactions considered		300
Business combination	Not according to SFAS 141	- 25
Materiality	Immaterial business combination	- 35
Data availability	Missing data	- 9
Total number of M&A transactions analyzed in the descriptive analysis		231
thereof purchase price allocations to be analyzed		231
thereof risk reports commenting on the risks of M&A transactions		216

Notes:

The sample comprises the randomly selected M&A transactions of US-GAAP acquirer firms completed between January 1st, 2005, and December 31st, 2008. The M&A transactions were retrieved from the ZEPHYR database on June 30th, 2009. Final purchase price allocations have to be published no later than one year after the completion of the M&A transaction in the notes to the financial statements. Risk reports commenting on the risks of M&A transactions are published in Item 1A of the 10-K filing.

Table 2: Descriptive statistics for M&A transactions

Panel A: Completion date												
01/01/2005 to 31/12/2005											43	
01/01/2006 to 31/12/2006											60	
01/01/2007 to 31/12/2007											78	
01/01/2008 to 31/12/2008											50	
Panel B: Target firm's home country												
United States											187	
Other countries											44	
thereof Argentina											1	
Australia											1	
Belize											1	
Brazil											1	
Canada											6	
China											1	
Denmark											1	
France											3	
Germany											1	
Hong Kong											2	
Israel											2	
Japan											1	
Luxemburg											2	
Netherlands											3	
Norway											1	
Poland											1	
Russia											1	
Sweden											2	
Switzerland											1	
United Kingdom											12	
Panel C: Acquirer firm's and target firm's industry												
		Acquirer firm's industry (SIC code division)										
		01-09	10-14	15-17	20-39	40-49	50-51	52-59	60-69	70-89	91-99	Total
Target firm's industry (SIC code division)	01-09	0	0	0	1	0	0	0	0	0	0	1
	10-14	0	16	0	1	1	0	0	0	0	0	18
	15-17	0	0	3	0	0	0	0	0	1	0	4
	20-39	0	1	0	82	2	1	1	0	6	0	97
	40-49	0	2	0	4	20	2	0	0	1	0	30
	50-51	0	1	0	8	0	1	0	0	0	0	10
	52-59	0	0	0	2	0	0	12	0	1	0	15
	60-69	0	0	0	2	2	0	0	0	2	0	6
	70-89	0	0	0	14	0	1	2	0	38	0	55
	91-99	0	0	0	0	0	0	0	0	0	0	0
Total		0	20	3	114	25	5	15	0	49	0	231

Notes:

Panel A presents the number of observations for the year of completion of this sample of M&A transactions that are accounted for under SFAS 141 between 2005 and 2008. Panel B presents the number of observations for the target firm's home country of this sample of M&A transactions. Panel C presents the number of observations for the acquirer firm's and the target firm's industry of this sample of M&A transactions. It makes use of the two-digit SIC codes of the SIC code divisions.

Table 3: Variable definition and measurement

Theoretical construct	Variable denoted by	Measurement	Source
M&A risk reporting			
M&A risk factors	<i>RISK_FACTS</i>	The number of M&A risk factors	Content analysis of M&A risk reporting
M&A risk reporting quantity	<i>RISK_QUAN</i>	The total number of M&A risk factors divided by total number of words of Item 1A	Content analysis of M&A risk reporting
M&A risk reporting quantity (macro-environment)	<i>RISK_QUAN_MACRO</i>	The number of M&A risk factors on the level of macro-environment divided by total number of words of Item 1A	Content analysis of M&A risk reporting
M&A risk reporting quantity (industry)	<i>RISK_QUAN_INDUSTRY</i>	The number of M&A risk factors on the level of industry divided by total number of words of Item 1A	Content analysis of M&A risk reporting
M&A risk reporting quantity (firm)	<i>RISK_QUAN_FIRM</i>	The number of M&A risk factors on the level of firm divided by total number of words of Item 1A	Content analysis of M&A risk reporting
M&A risk reporting quantity (M&A transaction)	<i>RISK_QUAN_M&A</i>	The number of M&A risk factors on the level of M&A divided by total number of words of Item 1A	Content analysis of M&A risk reporting
M&A risk reporting quality	<i>RISK_QUAL</i>	The mean of <i>RISK_QUAN</i> and <i>RISK_RICH</i>	Content analysis of M&A risk reporting
M&A risk reporting richness	<i>RISK_RICH</i>	The mean of <i>RISK_DEPTH</i> and <i>RISK_WIDTH</i>	Content analysis of M&A risk reporting
M&A risk reporting depth	<i>RISK_DEPTH</i>	The mean of <i>RISK_TYPE</i> , <i>RISK_NAT</i> , <i>RISK_SPEC</i> , and <i>RISK_TIME</i>	Content analysis of M&A risk reporting
M&A risk reporting type	<i>RISK_TYPE</i>	The sum of M&A risk factors with a weight of 2 if a risk factor is described quantitatively, 1 if a risk factor is described qualitatively, and 0 otherwise divided by the total number of words of Item 1A	Content analysis of M&A risk reporting
M&A risk reporting nature	<i>RISK_NAT</i>	The sum of M&A risk factors with a weight of 2 if a risk factor is described in monetary terms, 1 if a risk factor is described in non-monetary items, and 0 otherwise divided by the total number of words of Item 1A	Content analysis of M&A risk reporting
M&A risk reporting specificity	<i>RISK_SPEC</i>	The sum of M&A risk factors with a weight of 3 if a risk factor relates to a specific M&A transaction, 2 if a risk factor relates to several specific M&A transactions, 1 if a risk factor relates to M&A transactions in general, and 0 otherwise divided by the total number of words of Item 1A	Content analysis of M&A risk reporting
M&A risk reporting time horizon	<i>RISK_TIME</i>	The sum of M&A risk factors with a weight of 2 if a risk factor relates to current M&A transactions, 1 if a risk factor relates to future M&A transactions, and 0 otherwise divided by the total number of words of Item 1A	Content analysis of M&A risk reporting
M&A risk reporting width	<i>RISK_WIDTH</i>	The mean of <i>RISK_COV</i> and <i>RISK_DIS</i>	Content analysis of M&A risk reporting
M&A risk reporting coverage	<i>RISK_COV</i>	The percentage of the M&A risk reporting on the four different levels of analysis filled in by at least one M&A risk factor	Content analysis of M&A risk reporting
M&A risk reporting dispersion	<i>RISK_DIS</i>	$\frac{-\sum_{j=1}^4 p_j \ln p_j}{\ln 4}$	Content analysis of M&A risk reporting

Theoretical construct	Variable denoted by	Measurement	Source
sion		where p_j corresponds to the number of M&A risk factors on the level of analysis j divided by the total number of M&A risk factors	
M&A characteristics			
Relative target firm's size	<i>REL_SIZE</i>	Natural logarithm of the purchase price for target firm divided by natural logarithm of the market capitalization of the acquirer firm in the year before the M&A transaction	Hand-collected data and Thomson Reuters WORLDSCOPE
Privately-held target firm	<i>PRIVATE</i>	Dummy variable equal to 1 if the target firm is privately-held in the year before the M&A transaction and 0 otherwise	Hand-collected data
Purchase price allocation to goodwill	<i>GOODWILL</i>	Goodwill recognized in the M&A transaction divided by purchase price paid for the target firm	Hand-collected data
Industry relatedness	<i>RELATED</i>	The number of two-digit SIC codes that the acquirer firm and the target firm have in common divided by total number of unique two-digit SIC codes of the acquirer firm and the target firm in the year before the M&A transaction	Bureau van Dijk ZEPHYR
Cross-border M&A transaction	<i>XBORDER</i>	Dummy variable equal to 1 if the headquarters of the acquirer firm and the target firm are not based in the same country in the year before the M&A transaction and 0 otherwise	Bureau van Dijk ZEPHYR
M&A intensity	<i>AQ_INT</i>	Net assets from acquisitions divided by total assets of the acquirer firm in the year before the M&A transaction	Thomson Reuters WORLDSCOPE
Control variables			
Acquirer firm's profitability	<i>A_PROF</i>	Operating income divided by the average of year $t-2$'s and year $t-1$'s total assets for the acquirer firm in the year before the M&A transaction	Thomson Reuters WORLDSCOPE
Acquirer firm's leverage	<i>A_LEV</i>	Total long-term debt divided by total assets of the acquirer firm in the year before the M&A transaction	Thomson Reuters WORLDSCOPE
Acquirer firm's size	<i>A_SIZE</i>	Natural logarithm of the market capitalization of the acquirer firm in the year before the M&A transaction	Thomson Reuters WORLDSCOPE
Acquirer firm's visibility	<i>A_NEWS</i>	Natural logarithm of (the number of newspaper articles, newswires and press releases + 1) of the acquirer firm in the year before the M&A transaction	LEXISNEXIS
Acquirer firm's complexity	<i>A_COMPLEX</i>	Natural logarithm of the number of product segments in the year before the M&A transaction	Thomson Reuters WORLDSCOPE
Acquirer firm's volatility	<i>A_VOLA</i>	Volatility of the stock returns of the acquirer firm in the year before the M&A transaction	Thomson Reuters WORLDSCOPE
Acquirer firm's beta coefficient	<i>A_BETA</i>	Beta of the acquirer firm in the year before the M&A transaction	Thomson Reuters WORLDSCOPE
Acquirer firm's board size	<i>A_BD_SIZE</i>	Natural logarithm of the number of board members of the acquirer firm in the year before the M&A transaction	Hand-collected data
Acquirer firm's non-executive directors	<i>A_BD_NON</i>	Number of non-executive board members divided by the total number of board members of the acquirer firm in the year before the M&A transaction	Hand-collected data
Acquirer firm's independent directors	<i>A_BD_IND</i>	Number of independent board members divided by the total number of board members of the acquirer firm in the year before the M&A transaction	Hand-collected data
Acquirer firm's audit quality	<i>A_BIG4</i>	Dummy variable equal to 1 if the acquirer firm engaged a Big 4 auditing firm in the year before the M&A transaction and 0 otherwise	Hand-collected data
Method of	<i>SHARES</i>	Dummy variable equal to 1 if it is a pure stock-for-	Bureau van Dijk

Theoretical construct	Variable de-noted by	Measurement	Source
payment		stock M&A transaction and 0 otherwise	ZEPHYR

Table 4: Descriptive statistics

Variable	N	Mean	Standard deviation	Minimum	Q1	Median	Q3	Maximum
RISK_QUAN	231	0.010	0.007	0.000	0.005	0.008	0.012	0.042
RISK_QUAL	231	0.175	0.063	0.000	0.131	0.183	0.224	0.263
REL_SIZE	231	0.441	0.066	0.303	0.395	0.435	0.486	0.611
PRIVATE	231	0.528	0.500	0.000	0.000	1.000	1.000	1.000
GOODWILL	231	0.507	0.301	0.000	0.329	0.523	0.738	1.466
RELATED	231	0.520	0.373	0.000	0.250	0.500	1.000	1.000
XBORDER	231	0.190	0.394	0.000	0.000	0.000	0.000	1.000
AQ_INT	231	0.046	0.087	0.000	0.000	0.010	0.040	0.459
A_PROF	231	0.111	0.081	-0.122	0.062	0.107	0.159	0.362
A_LEV	231	0.195	0.170	0.000	0.061	0.157	0.289	0.702
A_SIZE	231	15.500	1.641	12.082	14.211	15.348	16.651	18.779
A_NEWS	231	4.064	1.868	0.000	2.708	3.912	5.347	8.517
A_COMPLEX	231	0.710	0.725	0.000	0.000	0.693	1.386	2.079
A_VOLA	231	0.299	0.119	0.109	0.207	0.269	0.370	0.679
A_BETA	231	1.212	0.805	-1.511	0.705	1.130	1.643	3.444
A_BD_SIZE	231	2.212	0.246	1.386	2.079	2.197	2.398	2.708
A_BD_NON	231	83.778	8.474	57.143	80.000	87.500	90.000	100.000
A_BD_IND	231	75.586	14.087	33.333	66.670	77.780	87.500	92.860
A_BIG4	231	0.935	0.247	0.000	1.000	1.000	1.000	1.000
SHARES	231	0.165	0.372	0.000	0.000	0.000	0.000	1.000

Notes:

Table 4 provides descriptive statistics (number of observations (N), mean, standard deviation, minimum, 25% quantile (Q1), median, 75% quantile (Q3), maximum). The variables are defined in Table 3.

Table 5: M&A risk factors

Panel A: Macro-environment and industry		
Risk factors	Share of firms	Quantity per firm
Macro-environment	57.41 %	2.83
Political factors	8.33%	0.17
Economic factors	25.46%	0.80
Social factors	3.70%	0.07
Technological factors	10.65%	0.17
Legal factors	30.56%	1.20
Environmental factors	7.41%	0.15
Foreign country-related factors (unspecified)	17.59%	0.26
Industry	67.13 %	3.42
General industry-related factors	15.74%	0.21
Competition-related factors	33.80%	0.87
Supplier-related factors	20.37%	0.36
Customer-related factors	55.09%	1.36
Other third-party-related factors	25.93%	0.63

Panel B: Firm

Risk factors	Share of firms	Quantity per firm
Firm	98.61%	27.56
Business	68.98%	1.73
Operations	44.44%	0.76
Management	75.46%	1.39
Growth opportunities	42.13%	0.70
Financial structure	94.91%	17.26
Financial condition	59.72%	1.18
Assets	39.35%	1.12
Recognition of goodwill	24.07%	0.42
Recognition of intangible assets	20.83%	0.41
Other assets-related factors	18.06%	0.29
Liabilities	69.91%	3.58
Incurrence of debt	50.46%	0.97
Assumption of liabilities	52.31%	0.92
Other liabilities-related factors	33.33%	1.69
Equity	47.22%	1.32
Issuance of equity and dilution of ownership	31.48%	0.50
Other equity-related factors	34.26%	0.82
Results	88.43%	3.30
Results (unspecified)	40.28%	0.64
Operating results	74.54%	1.76
Financial results	26.39%	0.35
Other results-related factors	31.94%	0.55
Revenue	19.91%	0.35
Costs, expenses, expenditures, and accounting charges	78.24%	5.63
Increase in costs (unspecified)	34.72%	0.54
Transaction-, merger-, and acquisition-related costs and charges	28.24%	0.48
Integration-related costs	37.96%	0.61
Impairment of goodwill	37.50%	0.94
Impairment of intangible asset	28.24%	0.59
Other costs, expenses, expenditures, and accounting charges	61.57%	2.47
Liquidity	38.43%	0.79
Litigation	40.74%	1.44
Human resources	67.13%	1.95
Employee fluctuation	60.19%	1.07
Other employee-related factors	40.74%	0.88
Other firm-specific risks	59.26%	2.32

Panel C: M&A transaction and other risks

Risk factors	Share of firms	Quantity per firm
M&A transaction	99.07%	18.80
Acquisition strategy	19.44%	0.33
Pre-M&A transaction risk	79.17%	4.21
Management of M&A transaction	37.96%	1.00
Identification of target firms	39.81%	0.83
Negotiation of conditions for M&A transaction	25.93%	0.32
Due diligence	31.48%	0.83
Purchase price	17.13%	0.21
Financing of M&A transaction	29.17%	0.46
Completion of M&A transaction	31.94%	0.57
Post-M&A transaction risk	96.76%	12.98
Management of combined businesses	50.46%	1.08
Integration	93.52%	7.93
Integration of acquisition	81.02%	1.97
Integration of operations	59.72%	1.05
Integration of technologies	25.93%	0.35
Integration of products	32.87%	0.98
Integration of personnel	41.67%	0.54
Other integration-related factors	68.06%	3.04
Restructuring	18.52%	0.28
Realization of synergies	82.87%	3.69
Realization of synergies (unspecified)	70.37%	2.08
Realization of cost synergies	40.74%	0.63
Realization of revenue synergies	29.63%	0.44
Realization of other synergies	29.63%	0.54
Delays related to M&A transaction, integration, and realization of benefits	57.41%	1.281
Other risks (unspecified)	71.76%	1.54
Total risk	100.00%	54.15

Notes:

Table 5 reports summary statistics regarding M&A risk factors for the sample of 216 acquirer firms that discuss these factors in their risk reporting in Item 1A of the 10-K filing. The table shows how many firms report on specific risk factors ('Share of firms') and how often a specific risk factor is mentioned on average ('Quantity per firm'). For example, 57.41 % of the acquirer firms mention at least one M&A risk factor on the level of macro-environment (see Appendix A for examples). An acquirer firm mentions 2.87 different M&A risk factors on the level of macro-environment on average. Panel A presents both macro-environmental risk factors and industry risk factors, Panel B firm-specific risk factors and Panel C both M&A specific risk factors and other unspecified risk factors.

Table 6: Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) RISK_QUAN	1.000 ***															
(2) RISK_QUAL	0.581 ***	1.000 ***														
(3) REL_SIZE	0.298 ***	0.139 **	1.000 ***													
(4) GOODWILL	0.177 ***	0.128 *	-0.029	1.000 ***												
(5) RELATED	0.146 **	0.128 *	0.123 *	-0.062	1.000 ***											
(6) AQ_INT	0.109	0.154 **	-0.006	-0.048	-0.145 **	1.000 ***										
(7) A_PROF	0.120 *	0.060	-0.085	0.128 *	-0.008	0.028	1.000 ***									
(8) A_LEV	-0.067	0.012	0.145 **	-0.154 **	-0.026	0.155 **	-0.190 ***	1.000 ***								
(9) A_SIZE	-0.201 ***	-0.311 ***	-0.237 ***	0.185 ***	-0.073	-0.023	0.295 ***	-0.284 ***	1.000 ***							
(10) A_NEWS	-0.218 ***	-0.229 ***	-0.112 *	0.222 ***	0.061	-0.066	0.165 **	-0.281 ***	0.796 ***	1.000 ***						
(11) A_COMPLEX	-0.080	-0.155 **	-0.102	0.074	-0.297 ***	-0.003	-0.124 *	0.003	0.273 ***	0.149 **	1.000 ***					
(12) A_VOLA	0.030	0.218 ***	0.024	0.008	0.138 **	-0.127 *	-0.136 **	-0.062	-0.346 ***	-0.116 *	-0.323 ***	1.000 ***				
(13) A_BETA	0.015	0.055	-0.067	0.081	-0.038	-0.158 **	0.015	-0.245 ***	-0.008	0.053	-0.072	0.521 ***	1.000 ***			
(14) A_BD_SIZE	-0.192 ***	-0.308 ***	-0.055	0.153 **	-0.075	-0.091	0.173 ***	-0.220 ***	0.589 ***	0.475 ***	0.134 **	-0.215 ***	0.058	1.000 ***		
(15) A_BD_NON	-0.206 ***	-0.149 **	-0.109 *	0.032	-0.118 *	-0.082	-0.062	-0.059	0.224 ***	0.130 **	0.147 **	-0.069	-0.013	0.331 ***	1.000 ***	
(16) A_BD_IND	-0.109	-0.161 **	-0.124 *	0.111 *	-0.099	-0.035	-0.016	-0.067	0.250 ***	0.239 ***	0.119 *	-0.087	0.085	0.257 ***	0.393 ***	1.000 ***

Notes:

The table reports the Bravais–Pearson correlation coefficients. The correlation matrix is based on 231 observations. The variables are defined in Table 3. *, ** and *** indicate statistical significance at less than the 0.1, 0.05, and 0.01 levels for two-tailed tests, respectively.

Table 7: Regression analysis

$$RISK_QUAN_{i,t} = b_0 + b_1 REL_SIZE_{i,t-1} + b_2 PUBLIC_{i,t-1} + b_3 GOODWILL_{i,t} + b_4 RELATED_{i,t-1} \quad (1)$$

$$+ b_5 XBORDER_{i,t-1} + b_6 AQ_INT_{i,t-1} + b_7 A_PROF_{i,t-1} + b_8 A_LEV_{i,t-1} \\ + b_9 A_SIZE_{i,t-1} + b_{10} A_NEWS_{i,t-1} + b_{11} A_COMPLEX_{i,t-1} + b_{12} A_VOLA_{i,t-1} \\ + b_{13} A_BETA_{i,t-1} + b_{14} A_BD_SIZE_{i,t-1} + b_{15} A_BD_NON_{i,t-1} + b_{16} A_BD_IND_{i,t-1} \\ + b_{17} A_BIG4_{i,t-1} + b_{18} SHARES_{i,t-1} + \sum_j^J f_j IND_i + \sum_k^K g_k YEAR_i$$

$$RISK_QUAL_{i,t} = c_0 + c_1 REL_SIZE_{i,t-1} + c_2 PUBLIC_{i,t-1} + c_3 GOODWILL_{i,t} + c_4 RELATED_{i,t-1} \quad (2)$$

$$+ c_5 XBORDER_{i,t-1} + c_6 AQ_INT_{i,t-1} + c_7 A_PROF_{i,t-1} + c_8 A_LEV_{i,t-1} \\ + c_9 A_SIZE_{i,t-1} + c_{10} A_NEWS_{i,t-1} + c_{11} A_COMPLEX_{i,t-1} + c_{12} A_VOLA_{i,t-1} \\ + c_{13} A_BETA_{i,t-1} + c_{14} A_BD_SIZE_{i,t-1} + c_{15} A_BD_NON_{i,t-1} + c_{16} A_BD_IND_{i,t-1} \\ + c_{17} A_BIG4_{i,t-1} + c_{18} SHARES_{i,t-1} + \sum_j^J m_j IND_i + \sum_k^K n_k YEAR_i$$

Explained variables		(1) RISK_QUAN				(2) RISK_QUAL				
Explanatory variables	Exp. sign	Coefficient	Marg. effect	t-stat	Sig.	Coefficient	Marg. effect	t-stat	Sig.	
H 1	REL_SIZE	+/-	0.0326	0.0290	3.726	***	0.1167	0.1161	1.534	
H 2	PRIVATE	+/-	-0.0000	-0.0000	-0.035		0.0137	0.0136	1.552	
H 3	GOODWILL	+/-	0.0054	0.0048	2.860	***	0.0538	0.0535	2.943	***
H 4	RELATED	-/+	0.0031	0.0028	2.534	**	0.0171	0.0171	1.166	
H 5	XBORDER	+/-	0.0018	0.0016	1.873	*	0.0157	0.0156	1.615	
H 6	AQ_INT	+/-	0.0128	0.0114	2.832	***	0.1506	0.1498	4.440	***
C	A_PROF	-/+	0.0122		2.365	**	0.1160		2.238	**
C	A_LEV	+/-	-0.0072		-2.937	***	-0.0378		-1.518	
C	A_SIZE	?	0.0003		0.491		-0.0062		-0.996	
C	A_NEWS	?	-0.0014		-2.986	***	-0.0018		-0.445	
C	A_COMPLEX	?	0.0007		1.032		0.0005		0.073	
C	A_VOLA	+/-	0.0023		0.474		0.0861		1.954	*
C	A_BETA	+/-	0.0002		0.255		0.0026		0.504	
C	A_BD_SIZE	-/+	-0.0031		-1.132		-0.0523		-2.466	**
C	A_BD_NON	-/+	-0.0002		-2.689	***	-0.0001		-0.264	
C	A_BD_IND	-/+	0.0000		0.639		-0.0002		-0.530	
C	A_BIG4	-/+	0.0048		3.088	***	0.0119		0.716	
C	SHARES	?	0.0004		0.249		0.0011		0.103	
C	IND _i	?		Incl.				Incl.		
C	YEAR _k	?		Incl.				Incl.		
	Constant	?	0.0033		0.323		0.2632		2.553	**
Number of observations					231				231	
Left-censored observations					15				15	
F-statistic					5.548	***			3.210	***
Log pseudolikelihood					776.822				289.762	
Largest VIF					5.012				5.012	

Notes:

The table reports the regression coefficients, the marginal effects for the unconditional expected value, and t-statistics from multiple Tobit regressions of the M&A risk reporting quantity (*RISK_QUAN*) and the M&A risk reporting quality (*RISK_QUAL*) on a series of variables. It also presents the number of observations, the number of left-censored observations, the F-statistic, the log pseudolikelihood, and the largest variance inflation factor (VIF). The standard errors are clustered at the level of the acquirer firm. The regression model is defined in section 3.2.2; the variables are defined in Table 3.

*, ** and *** indicate statistical significance at less than the 0.1, 0.05, and 0.01 levels for two-tailed tests, respectively.

Table 8: Additional regression analysis for subdimensions of the risk reporting quantity

Explained variables		<i>RISK_QUAN_MACRO</i>				<i>RISK_QUAN_INDUSTRY</i>				<i>RISK_QUAN_FIRM</i>				<i>RISK_QUAN_M&A</i>				
Explanatory variables	Exp. sign	Coefficient	Marg. effect	t-stat	Sig.	Coefficient	Marg. effect	t-stat	Sig.	Coefficient	Marg. effect	t-stat	Sig.	Coefficient	Marg. effect	t-stat	Sig.	
H 1	<i>REL_SIZE</i>	+/-	0.0042	0.0020	2.843	***	0.0038	0.0023	3.178	***	0.0220	0.0189	4.249	***	0.0060	0.0053	1.882	*
H 2	<i>PRIVATE</i>	+/-	0.0005	0.0002	2.349	**	0.0002	0.0001	1.619		0.0001	0.0001	0.263		-0.0006	-0.0005	-1.466	
H 3	<i>GOODWILL</i>	+/-	0.0006	0.0003	1.524		0.0004	0.0002	1.419		0.0026	0.0022	2.417	**	0.0024	0.0021	3.235	***
H 4	<i>RELATED</i>	-/+	0.0003	0.0001	1.173		0.0001	0.0001	0.577		0.0008	0.0007	1.203		0.0018	0.0016	3.496	***
H 5	<i>XBORDER</i>	+/-	0.0004	0.0002	1.980	**	0.0002	0.0001	1.312		0.0010	0.0009	1.730	*	0.0003	0.0002	0.645	
H 6	<i>AQ_INT</i>	+/-	0.0013	0.0006	2.122	**	0.0017	0.0010	3.171	***	0.0045	0.0038	1.703	*	0.0068	0.0060	3.515	***
C	<i>A_PROF</i>	-/+	0.0040		3.115	***	0.0003		0.380		0.0070		2.322	**	0.0026		1.173	
C	<i>A_LEV</i>	+/-	-0.0002		-0.405		-0.0007		-2.035	**	-0.0042		-2.951	***	-0.0026		-2.715	***
C	<i>A_SIZE</i>	?	0.0001		1.351		0.0002		1.856	*	0.0001		0.289		-0.0001		-0.229	
C	<i>A_NEWS</i>	?	-0.0002		-2.279	**	-0.0001		-1.428		-0.0006		-2.449	**	-0.0006		-2.862	***
C	<i>A_COMPLEX</i>	?	0.0001		0.649		-0.0002		-2.033	**	0.0002		0.570		0.0005		1.899	*
C	<i>A_VOLA</i>	+/-	0.0004		0.413		0.0022		3.064	***	0.0003		0.099		0.0010		0.537	
C	<i>A_BETA</i>	+/-	-0.0001		-1.107		-0.0000		-0.292		0.0001		0.243		0.0001		0.487	
C	<i>A_BD_SIZE</i>	-/+	-0.0025		-2.963	***	-0.0007		-1.913	*	-0.0022		-1.491		0.0010		1.078	
C	<i>A_BD_NON</i>	-/+	-0.0000		-1.205		-0.0000		-0.915		-0.0001		-2.191	**	-0.0001		-3.240	***
C	<i>A_BD_IND</i>	-/+	0.0000		0.282		-0.0000		-0.230		0.0000		0.581		0.0000		0.861	
C	<i>A_BIG4</i>	-/+	0.0004		1.132		-0.0000		-0.057		0.0027		3.371	***	0.0017		2.604	**
C	<i>SHARES</i>	?	-0.0000		-0.023		0.0000		0.125		0.0004		0.479		-0.0001		-0.090	
C	<i>IND_i</i>	?		Incl.				Incl.					Incl.				Incl.	
C	<i>YEAR_k</i>	?		Incl.				Incl.					Incl.				Incl.	
	<i>Constant</i>	?	0.0012		0.670		-0.0019		-1.390		0.0011		0.183		0.0024		0.626	
Number of observations				231				231				231						
Left-censored observations				107				86				18						
F-statistic				2.178 ***				2.069 ***				4.776 ***						
Log pseudolikelihood				613.523				767.608				879.709						

Notes:

The table reports the regression coefficients, the marginal effects for the unconditional expected value, and t-statistics from multiple Tobit regressions of the M&A risk reporting quantity in connection with the macro-environment (*RISK_QUAN_MACRO*), the industry (*RISK_QUAN_INDUSTRY*), the firm (*RISK_QUAN_FIRM*), and the M&A transaction (*RISK_QUAN_M&A*) on a series of variables. It also presents the number of observations, the number of left-censored observations, the F-statistic, and the log pseudolikelihood. The standard errors are clustered at the level of the acquirer firm. The regression model is defined in section 3.2.2; the variables are defined in Table 3.

*, ** and *** indicate statistical significance at less than the 0.1, 0.05, and 0.01 levels for two-tailed tests, respectively.

Table 9: Additional regression analysis for subdimensions of the risk reporting depth

Explained variables		<i>RISK_TYPE</i>				<i>RISK_NAT</i>				<i>RISK_SPEC</i>				<i>RISK_TIME</i>					
Explanatory variables	Exp. sign	Coefficient	Marg. effect	t-stat	Sig.	Coefficient	Marg. effect	t-stat	Sig.	Coefficient	Marg. effect	t-stat	Sig.	Coefficient	Marg. effect	t-stat	Sig.		
H 1	<i>REL_SIZE</i>	+/-	0.0342	0.0304	3.815	***	0.0068	0.0026	3.915	***	0.0962	0.0779	4.293	***	0.0590	0.0517	3.609	***	
H 2	<i>PRIVATE</i>	+/-	-0.0000	-0.0000	-0.010		-0.0000	-0.0000	-0.177		-0.0015	-0.0012	-0.683		-0.0009	-0.0008	-0.539		
H 3	<i>GOODWILL</i>	+/-	0.0056	0.0050	2.926	***	0.0008	0.0003	2.111	**	0.0139	0.0112	2.796	***	0.0109	0.0096	3.098	***	
H 4	<i>RELATED</i>	-/+	0.0032	0.0028	2.516	**	0.0002	0.0001	0.851		0.0088	0.0071	2.877	***	0.0059	0.0052	2.650	***	
H 5	<i>XBORDER</i>	+/-	0.0019	0.0017	1.933	*	0.0004	0.0001	1.554		0.0046	0.0038	2.029	**	0.0032	0.0029	1.893	*	
H 6	<i>AQ_INT</i>	+/-	0.0124	0.0110	2.693	***	-0.0018	-0.0007	-1.765	*	0.0188	0.0152	1.843	*	0.0172	0.0150	2.097	**	
C	<i>A_PROF</i>	-/+	0.0128		2.401	**	0.0024		2.376	**	0.0322		2.617	**	0.0224		2.358	**	
C	<i>A_LEV</i>	+/-	-0.0075		-2.956	***	-0.0009		-1.720	*	-0.0205		-3.316	***	-0.0125		-2.848	***	
C	<i>A_SIZE</i>	?	0.0003		0.426		-0.0003		-2.095	**	0.0006		0.378		0.0005		0.461		
C	<i>A_NEWS</i>	?	-0.0014		-2.966	***	-0.0000		-0.060		-0.0041		-3.280	***	-0.0026		-2.944	***	
C	<i>A_COMPLEX</i>	?	0.0007		0.997		-0.0001		-0.785		-0.0000		-0.012		0.0015		1.242		
C	<i>A_VOLA</i>	+/-	0.0022		0.437		-0.0000		-0.003		-0.0019		-0.156		0.0007		0.076		
C	<i>A_BETA</i>	+/-	0.0002		0.324		0.0001		0.893		0.0006		0.342		0.0008		0.623		
C	<i>A_BD_SIZE</i>	-/+	-0.0034		-1.201		-0.0012		-2.081	**	-0.0097		-1.458		-0.0072		-1.433		
C	<i>A_BD_NON</i>	-/+	-0.0002		-2.528	**	0.0000		2.528	**	-0.0002		-1.262		-0.0002		-2.225	**	
C	<i>A_BD_IND</i>	-/+	0.0000		0.623		-0.0000		-0.352		0.0001		0.710		0.0000		0.374		
C	<i>A_BIG4</i>	-/+	0.0048		3.008	***	-0.0000		-0.090		0.0124		3.348	***	0.0097		3.279	***	
C	<i>SHARES</i>	?	0.0005		0.284		0.0003		1.060		0.0018		0.437		-0.0003		-0.098		
C	<i>IND_i</i>	?		Incl.				Incl.					Incl.				Incl.		
C	<i>YEAR_k</i>	?		Incl.				Incl.					Incl.				Incl.		
	<i>Constant</i>	?	0.0034		0.324		0.0001		0.059		-0.0111		-0.413		0.0044		0.222		
Number of observations				231				231				231				231			
Left-censored observations				15				141				15				15			
F-statistic				5.581 ***				2.763 ***				6.093 ***				5.331 ***			
Log pseudolikelihood				771.504				424.460				581.281				649.174			

Notes:

The table reports the regression coefficients, the marginal effects for the unconditional expected value, and t-statistics from multiple Tobit regressions of the M&A risk reporting type (*RISK_TYPE*), nature (*RISK_NAT*), specificity (*RISK_SPEC*), and time horizon (*RISK_TIME*) on a series of variables. It also presents the number of observations, the number of left-censored observations, the F-statistic, and the log pseudolikelihood. The standard errors are clustered at the level of the acquirer firm. The regression model is defined in section 3.2.2; the variables are defined in Table 3.

*, ** and *** indicate statistical significance at less than the 0.1, 0.05, and 0.01 levels for two-tailed tests, respectively.

Table 10: Additional regression analysis of the subdimensions of the risk reporting width

Explained variables		<i>RISK_COV</i>				<i>RISK_DIS</i>				
Explanatory variables	Exp. sign	Coefficient	Marg. effect	t-stat	Sig.	Coefficient	Marg. effect	t-stat	Sig.	
H 1	<i>REL_SIZE</i>	+/-	0.4671	0.4643	1.376		0.2288	0.2277	0.902	
H 2	<i>PRIVATE</i>	+/-	0.0554	0.0551	1.375		0.0561	0.0559	1.921	*
H 3	<i>GOODWILL</i>	+/-	0.2141	0.2128	2.663	***	0.1857	0.1848	2.915	***
H 4	<i>RELATED</i>	-/+	0.0738	0.0734	1.144		0.0398	0.0396	0.763	
H 5	<i>XBORDER</i>	+/-	0.0696	0.0693	1.625		0.0446	0.0444	1.255	
H 6	<i>AQ_INT</i>	+/-	0.6773	0.6733	4.162	***	0.4637	0.4615	4.176	***
C	<i>A_PROF</i>	-/+	0.4285		1.824	*	0.4296		2.346	**
C	<i>A_LEV</i>	+/-	-0.1492		-1.299		-0.1053		-1.269	
C	<i>A_SIZE</i>	?	-0.0345		-1.242		-0.0183		-0.878	
C	<i>A_NEWS</i>	?	-0.0034		-0.183		-0.0006		-0.047	
C	<i>A_COMPLEX</i>	?	0.0044		0.130		-0.0026		-0.103	
C	<i>A_VOLA</i>	+/-	0.3477		1.711	*	0.3403		2.320	**
C	<i>A_BETA</i>	+/-	0.0134		0.577		0.0059		0.322	
C	<i>A_BD_SIZE</i>	-/+	-0.2407		-2.568	**	-0.1567		-2.180	**
C	<i>A_BD_NON</i>	-/+	-0.0005		-0.231		0.0004		0.217	
C	<i>A_BD_IND</i>	-/+	0.0001		0.075		-0.0018		-1.578	
C	<i>A_BIG4</i>	-/+	0.0398		0.513		0.0220		0.416	
C	<i>SHARES</i>	?	0.0116		0.232		-0.0057		-0.157	
C	<i>IND_i</i>	?		Incl.				Incl.		
C	<i>YEAR_k</i>	?		Incl.				Incl.		
	<i>Constant</i>	?	1.2484		2.697	***	0.8672		2.493	***
Number of observations					231				231	
Left-censored observations					15				18	
<i>F</i> -statistic					3.130	***			2.328	***
Log pseudolikelihood					-34.891				21.354	

Notes:

The table reports the regression coefficients, the marginal effects for the unconditional expected value, and t-statistics from multiple Tobit regressions of the M&A risk reporting coverage (*RISK_COV*) and M&A risk reporting dispersion (*RISK_DIS*) on a series of variables. It also presents the number of observations, the number of left-censored observations, the F-statistic, and the log pseudolikelihood. The standard errors are clustered at the level of the acquirer firm. The regression model is defined in section 3.2.2; the variables are defined in Table 3.

*, ** and *** indicate statistical significance at less than the 0.1, 0.05, and 0.01 levels for two-tailed tests, respectively.

Appendix

Appendix A: Risk categories

Risk factor	Examples
Macro-environment	
Political factors	Political risks; political climates; less stable governments; government policies
Economic factors	Economic risks; general economic conditions; more vulnerable to economic downturns; foreign currency; currency exchange rate fluctuations; interest rate changes; decline in commodity prices; oil and natural gas prices
Social factors	Social instability; social turmoil; societal pressures
Technological factors	Advances in technology
Environmental factors	Environmental risk; unfavorable weather conditions; earthquake
Legal factors	Changes in the legal environment; less stable legal systems; legislative pressure; changes in the regulatory environment; changes in federal, state, local or tribal regulation; regulatory pressures; necessary government approvals for the acquisition; regulatory actions imposing obligations
Unspecified foreign country-related factors	Difficulties in operating in foreign countries; international acquisitions may present unique challenges and increase the company's exposure to the risks associated with foreign operations and countries
Industry	
General industry-related factors	Industry risks; changes in the industry; a shift in industry dynamics; consolidation in our industry; exposure to cyclical downturns in historically cyclical industries; high-technology companies are inherently risky
Competition-related factors ¹⁹	Competitiveness; significant competition; competitive position; competitive disadvantage; less leveraged competitors; non-competition agreement
Supplier-related factors	Lose suppliers; dependence on unfamiliar suppliers; limited supply
Customer-related factors	Lose key customers; retain customers; limited number of customers; high-quality customer service; dissatisfaction with the combined companies' product lines
Other third-party-related factors	Other third-party relationships; maintain relationships with others with whom we have business dealings; entities with which we have technology relationships; manufacturing relationship; licensing relationship; business partner relationships; strategic partner relationships
Firm	
Business	Our business may suffer; a material adverse impact on our consolidated business
Operations	Operations may be adversely affected; interruption or slow down the operations of our existing businesses
Management	Diversion of management's attention
Growth opportunities	Growth of our business; growth expectations; our growth rate; business prospects; realize the business opportunities

¹⁹ Competition-related factors only refer to the competition of the combined firm with other firms. The competition among suppliers or customers is subsumed under the corresponding categories.

Risk factor	Examples
Financial structure	
Financial condition	Financial condition; financial situation; financial position
Assets	
Recognition of goodwill	Substantial goodwill; a significant portion of our assets consists of goodwill
Recognition of intangible assets	Finite-lived acquired intangible assets recorded on our balance sheet; fair market value adjustments to intangible assets
Other assets-related factors	Material amount of long-lived assets; working capital requirements; further investments
Liabilities	
Incurrence of long-term debt	Incurred substantial indebtedness; raising debt
Assumption of liabilities	Unanticipated liabilities; latent liabilities; pre-existing liabilities; contingent liabilities; known liabilities
Other liabilities-related factors	Debt covenant; incur short-term debt; credit rating
Equity	
Issuance of equity and dilution of ownership	Issue equity; issue equity that would dilute our current stockholders' ownership; dilutive issuances of equity
Other equity-related factors	Stockholders' equity; stock price; market reaction
Results	
Results (unspecified)	Net income; earnings; profits; loss; results
Operating results	Operating results; operating performance
Financial results	Financial performance; financial results
Other results-related factors	Profitability; earnings per share; gross margin
Revenue	Reduction in our revenues; sales will suffer
Costs, expenses, expenditures, and accounting charges	
Increase in costs (unspecified)	Increase costs; unanticipated costs; control costs
Transaction-, merger-, and acquisition-related costs and charges	Costs associated with the merger; acquisition-related charge; expenses related to our acquisition
Integration-related costs	Additional and unforeseen expenses in connection with the integration efforts; cost-effective in integrating
Impairment of goodwill	Impairment of goodwill
Impairment of intangible asset	Impairment of intangible assets
Other costs, expenses, expenditures, and accounting charges	Unforeseen expenses; incurrence of significant ongoing expenses; amortization; charges related to discontinuances of certain of target firm's products; in-process research and development charges
Liquidity	Liquidity; adversely affect our cash flow; cash position
Litigation	Legal exposure; litigation; liabilities related to litigation or other legal proceedings involving the acquired business; limitations on rights to indemnity from the seller
Human resources	
Employee fluctuation	Lose key employees; recruit new personnel; retain employees with the requisite skills and knowledge
Other employee-related factors	Workplace dissatisfaction; preserve employee morale; persuade the employees that the two former companies' business cultures are compatible; train employees
Other firm-specific risks	Business reputation; redeployment of resources; lose anticipated tax benefits; frequent new product introductions
M&A transaction	

Risk factor	Examples
Acquisition strategy	Successfully implement our acquisition strategy; execute our planned growth strategy
Pre-M&A transaction risk	
Management of M&A transaction	Manage acquisitions successfully; effectively manage our acquisitions; our failure to manage successfully and coordinate the growth of the combined company
Identification of target firms	Identifying suitable acquisition candidates; limited opportunities for future acquisitions
Negotiation of conditions for M&A transaction	Successfully negotiate; negotiate acceptable purchase contracts
Due diligence	Difficulty of gathering full information regarding the target business prior to the acquisition; failure to identify material risks; changes to other key assumptions; requires judgment
Purchase price	Higher relative price than that which we have paid historically; expensive acquisitions; pay more than it is worth
Financing of M&A transaction	Obtain financing on acceptable terms; successfully fund; sufficient funding for an acquisition may not be available
Completion of M&A transaction	Complete; consummate; close
Post-M&A transaction risk	
Management of combined businesses	Operate combined businesses successfully; implement proper overall business controls
Integration	
Integration of acquisition	Integrate acquisition; Integrate the acquired businesses; the successful integration of independent businesses or assets is a complex process; integration and other risks associated with business combination; integration issues
Integration of operations	Integrate operations; integrate operational procedures
Integration of technologies	Integrate technology; disparate technologies; potential incompatibility of technologies
Integration of products	Integrate products and services; combining and simplifying diverse product and service offerings
Integration of personnel	Integrate personnel; integrate management teams; integrate compensation arrangements; integrate payroll system
Other integration-related factors	Integrate companies; coordinating and combining subsidiaries; coordinate research and development efforts; integration of sales, marketing and distribution capabilities; integrate corporate and administrative functions
Restructuring	Implement restructuring programs: business restructuring; improving the utilization of equipment and facilities
Realization of synergies	
Realization of synergies (unspecified)	Anticipated benefits; unrealized expected synergies
Realization of cost synergies	Cost savings; cost efficiencies; cost reductions
Realization of revenue synergies	Revenue benefits; revenue enhancements
Realization of other synergies	Economic benefits; financial benefits; operational improvements; strategic synergies
Delays related to M&A transaction, integration, and realization of benefits	Delays in connection with the merger; integrate in a timely manner; unanticipated delays in realizing the benefits
Other risks	Numerous risks; various issues; other risks

Appendix B: Decision rules for coding of the M&A risk reporting

The decision rules for the analysis of M&A risk disclosures build on the decision rules by :

- A section of Item 1A of the 10-K filing covers one or more paragraphs usually under a common heading that briefly summarizes the risk factors discussed in this section.
- If a section of Item 1A of the 10-K filing refers to a specific merger or acquisition (i.e., the name of the target firm mentioned) or to mergers and acquisitions in general (including sections regarding goodwill), it will be considered for the content analysis.
- If a section of Item 1A of the 10-K filing refers to more general risk factors, the related sections are only considered with regard to the subset of sentences that explicitly refer to a specific merger or acquisition (i.e., the name of the target firm mentioned) or to mergers and acquisitions in general.
- Instances of disclosure, i.e., a group of words containing a single piece of information, are to be coded as risk factors '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 firm or may impact upon the firm in the future or of the management of any such opportunity, prospect, hazard, harm, threat or exposure' .
- By using instances of disclosures, i.e., a group of words containing a single piece of information, as recording units, it is allowed to code more than one risk factor per sentence. A sentence is a syntactically independent grammatically unit of a single word or a group of words. In an unnumbered list, each bullet point is considered as a separate sentence. In a numbered list, each number is considered as a separate sentence.
- The risk factors shall be classified according to the coding scheme presented in Table 5, and by reference to the risk categories in Appendix A.
- All risk factors must be explicitly stated and cannot be implied.
- Any risk factor that is repeated shall be recorded as a risk factor each time it is discussed.
- It is coded whether a risk factor is quantified (monetary or non-monetary measurements) or not. If a risk factor is quantified, it is coded whether it is a monetary or non-monetary measurement. Monetary measurements provide specific information on the financial impact of a risk factor.
- It is coded whether a risk factor relates to a specific M&A (only name of the target firm mentioned), to multiple M&As (multiple target firms mentioned) or to no specific M&A (no target firm mentioned).
- It is coded whether a risk factor relates to current or to future M&As. Future risk disclosures refer exclusively to 'future' or 'potential' M&As.
- If disclosure is too vague in its reference to risk, then it is not considered as a risk factor.

Appendix C: Examples

Examples of the M&A risk reporting		Coding
Acquisition of Ascential Software Corp. by IBM Corp		
Acquisitions and Alliances:		
<p>The company has made and expects to continue to make acquisitions or enter into alliances from time to time. Acquisitions and alliances present significant challenges and risks relating to the <u>integration of the business into the company (M&A)</u>, and there can be no assurances that the company will <u>manage acquisitions and alliances successfully (M&A)</u>. The related risks include the company <u>failing to achieve strategic objectives (M&A)</u> and <u>anticipated revenue improvements (M&A)</u> and <u>cost savings (M&A)</u>, as well as the <u>failure to retain key personnel of the acquired business (F)</u> and the <u>assumption of liabilities related to litigation or other legal proceedings involving the acquired business (F)</u>.</p> <p>Excerpt of Item 1A of 10-K filing for the fiscal year ended December 31, 2005, by International Business Machines Corp. (2006).</p>		<p>Levels of analysis</p> <ul style="list-style-type: none"> • Macro-environment (M): 0 • Industry (I) : 0 • Firm (F): 2 • M&A transaction (M&A): 5 • Other (O): 0 <p>Properties</p> <ul style="list-style-type: none"> • Nature: <ul style="list-style-type: none"> - Qualitative: 7 - Quantitative: 0 • Type: <ul style="list-style-type: none"> - Non-monetary: 0 - Monetary: 0 • Specificity: <ul style="list-style-type: none"> - Specific M&A: 0 - Multiple specific M&As: 0 - M&As in general: 7 • Time horizon <ul style="list-style-type: none"> - Current M&A(s): 7 - Future M&A (s): 0 <p>Number of words of Item 1A: 3,194</p>
<i>RISK_QUAN</i>	The total number of M&A risk factors divided by total number of words of Item 1A	$7 / 3,194 = 0.002$
<i>RISK_QUAL</i>	The mean of <i>RISK_QUAN</i> and <i>RISK_RICH</i>	$(0.002 + 0.234) / 2 = 0.118$
<i>RISK_RICH</i>	The mean of <i>RISK_DEPTH</i> and <i>RISK_WIDTH</i>	$(0.002 + 0.466) / 2 = 0.234$
<i>RISK_DEPTH</i>	The mean of <i>RISK_TYPE</i> , <i>RISK_NAT</i> , <i>RISK_SPEC</i> , and <i>RISK_TIME</i>	$(0.002 + 0.0000 + 0.002 + 0.004) / 4 = 0.002$
<i>RISK_TYPE</i>	The sum of M&A risk factors with a weight of 2 if a risk factor is described quantitatively, 1 if a risk factor is described qualitatively, and 0 otherwise divided by the total number of words of Item 1A	$(2 \times 0 + 1 \times 7) / 3,194 = 0.002$
<i>RISK_NAT</i>	The sum of M&A risk factors with a weight of 2 if a risk factor is described in monetary terms, 1 if a risk factor is described in non-monetary items, and 0 otherwise divided by the total number of words of Item 1A	$(2 \times 0 + 1 \times 0) / 3,194 = 0.000$
<i>RISK_SPEC</i>	The sum of M&A risk factors with a weight of 3 if a risk factor relates to a specific M&A transaction, 2 if a risk factor relates to several specific M&A transactions, 1 if a risk factor relates to M&A transactions in general, and 0 otherwise divided by the total number of words of Item 1A	$(3 \times 0 + 2 \times 0 + 1 \times 7) / 3,194 = 0.002$
<i>RISK_TIME</i>	The sum of M&A risk factors with a weight of 2 if a risk factor relates to current M&A transactions, 1 if a risk factor relates to future M&A transactions, and 0 otherwise divided by the total number of words of Item 1A	$(2 \times 7 + 1 \times 0) / 3,194 = 0.004$
<i>RISK_WIDTH</i>	The mean of <i>RISK_COV</i> and <i>RISK_DIS</i>	$(0.500 + 0.432) = 0.466$

Examples of the M&A risk reporting		Coding
<i>RISK_COV</i>	The percentage of the M&A risk reporting on the four different levels of analysis filled in by at least one M&A risk factor	2 out of 4 = 0.500
<i>RISK_DIS</i>	$-\frac{\sum_{j=1}^4 p_j \ln p_j}{\ln 4}$ where p_j corresponds to the number of M&A risk factors on the level of analysis j divided by the total number of M&A risk factors	$-(0/7 \times \ln(0/7) + 0/7 \times \ln(0/7) + 2/7 \times \ln(2/7) + 5/7 \times \ln(5/7)) / \ln 4 = 0.432$
Acquisition of Chambord Liqueur by Brown-Forman Corp. <u>Our acquisition strategies (M&A) and integration of acquired businesses (M&A) may not be successful.</u>		
<p>From time to time, we acquire additional businesses that we believe to be a strategic fit, such as our recent purchases of the Casa Herradura business, Chambord Liqueur and the remainder of Don Eduardo. <u>Integration of acquired businesses (M&A) and personnel (M&A)</u> into our existing operations, and <u>bringing them into conformity with our trade practice standards (M&A), financial control environment and US public company requirements (M&A)</u>, may prove difficult, may involve <u>significant expenses (F)</u> and <u>management time and attention (F)</u>, and may <u>otherwise disrupt our business (F)</u>. Our ability to <u>grow the volumes (F)</u> and <u>maintain or increase the profit margins (F)</u> on these brands, especially in the US or Mexico, will be <u>important to our future performance (F)</u>. Additionally, business acquisitions such as these may expose us to <u>unknown liabilities (F)</u>, the <u>possible loss of key customers (I)</u> and <u>employees knowledgeable about the acquired business (F)</u>, and risks associated with doing business in countries or regions with <u>less stable governments (M)</u>, <u>political climates (M)</u>, <u>legal systems (M)</u> and/or <u>economies (M)</u>, among <u>other risks (O)</u>.</p> <p>Excerpt of Item 1A of 10-K filing for the fiscal year ended April 30, 2007, by Brown-Forman Corp. (2007).</p>		<p>Levels of analysis</p> <ul style="list-style-type: none"> • Macro-environment (M): 4 • Industry (I) : 1 • Firm (F): 8 • M&A transaction (M&A): 6 • Other (O): 1 <p>Properties</p> <ul style="list-style-type: none"> • Nature: <ul style="list-style-type: none"> - Qualitative: 20 - Quantitative: 0 • Type: <ul style="list-style-type: none"> - Non-monetary: 0 - Monetary: 0 • Specificity: <ul style="list-style-type: none"> - Specific M&A: 0 - Multiple specific M&As: 20 - M&As in general: 0 • Time horizon <ul style="list-style-type: none"> - Current M&A(s): 20 - Future M&A (s): 0 <p>Number of words of Item 1A: 1,993</p>
<i>RISK_QUAN</i>	The total number of M&A risk factors divided by total number of words of Item 1A	20 / 1,993 = 0.010
<i>RISK_QUAL</i>	The mean of <i>RISK_QUAN</i> and <i>RISK_RICH</i>	(0.010 + 0.473) / 2 = 0.242
<i>RISK_RICH</i>	The mean of <i>RISK_DEPTH</i> and <i>RISK_WIDTH</i>	(0.013 + 0.933) / 2 = 0.473
<i>RISK_DEPTH</i>	The mean of <i>RISK_TYPE</i> , <i>RISK_NAT</i> , <i>RISK_SPEC</i> , and <i>RISK_TIME</i>	(0.010 + 0.000 + 0.020 + 0.020) / 4 = 0.013
<i>RISK_TYPE</i>	The sum of M&A risk factors with a weight of 2 if a risk factor is described quantitatively, 1 if a risk factor is described qualitatively, and 0 otherwise divided by the total number of words of Item 1A	(2 × 0 + 1 × 20) / 1,993 = 0.010
<i>RISK_NAT</i>	The sum of M&A risk factors with a weight of 2 if a risk factor is described in monetary terms, 1 if a risk factor is described in non-monetary items, and 0 otherwise divided by the total number of words of Item 1A	(2 × 0 + 1 × 0) / 1,993 = 0.000
<i>RISK_SPEC</i>	The sum of M&A risk factors with a weight of 3 if a risk factor relates to a specific M&A transaction, 2 if a risk factor relates to several specific M&A transactions, 1 if a risk factor relates to M&A transactions in general, and 0 otherwise divided by the total number of words of Item 1A	(3 × 0 + 2 × 20 + 1 × 0) / 1,993 = 0.020
<i>RISK_TIME</i>	The sum of M&A risk factors with a weight of 2 if a risk factor relates to current M&A transactions,	(2 × 20 + 1 × 0) / 1,993 = 0.020

Examples of the M&A risk reporting	Coding
	1 if a risk factor relates to future M&A transactions, and 0 otherwise divided by the total number of words of Item 1A
<i>RISK_WIDTH</i>	The mean of <i>RISK_COV</i> and <i>RISK_DIS</i> (1.000 + 0.865) = 0.933
<i>RISK_COV</i>	The percentage of the M&A risk reporting on the four different levels of analysis filled in by at least one M&A risk factor 4 out of 4 = 1.000
<i>RISK_DIS</i>	$-\frac{\sum_{j=1}^4 p_j \ln p_j}{\ln 4}$ where p_j corresponds to the number of M&A risk factors on the level of analysis j divided by the total number of M&A risk factors - (4/20 × ln(4/19) + 1/20 × ln(1/20) + 8/20 × ln(8/20) + 6/20 × ln(6/20)) / ln 4 = 0.865

Examples for the properties of the M&A risk factors

<p>[...] Upon completion of the acquisition of Foundry, Brocade increased its indebtedness by approximately \$1.1 billion, which is substantially greater than its indebtedness prior to the acquisition. [...] Excerpt of Item 1A of 10-K filing for the fiscal year ended October 31, 2009, by Brocade Communications Systems Inc. (2009).</p>	<p>This expression provides monetary information about a risk factor related to a specific current M&A transaction. Consequently, this M&A risk factor is weighted by 2 for <i>RISK_TYPE</i>, 2 for <i>RISK_NAT</i>, 3 for <i>RISK_SPEC</i>, and 2 for <i>RISK_TIME</i>.</p>
<p>[...] Brocade incurred substantial indebtedness to finance the acquisition of Foundry that decreases Brocade's business flexibility and access to capital, and increases its borrowing costs, which may adversely affect Brocade's operations and financial results. [...] Excerpt of Item 1A of 10-K filing for the fiscal year ended October 31, 2009, by Brocade Communications Systems Inc. (2009).</p>	<p>This expression provides qualitative information about a risk factor related to a specific current M&A transaction. Consequently, this M&A risk factor is weighted by 1 for <i>RISK_TYPE</i>, 0 for <i>RISK_NAT</i>, 3 for <i>RISK_SPEC</i>, and 2 for <i>RISK_TIME</i>.</p>
<p>[...] The integration of Delta and NWA workforces will be challenging in part because approximately 80% of the NWA employees are represented by labor unions while, among US based employees, only the pre-merger Delta pilots and flight dispatchers (who combined constitute approximately 17% of the total pre-merger Delta employees) are currently represented by labor unions. [...] Excerpt of Item 1A of 10-K filing for the fiscal year ended December 31, 2008, by Delta Air Lines Inc. (2009).</p>	<p>This expression provides quantitative, but non-monetary information about a risk factor related to a specific current M&A transaction. Consequently, this M&A risk factor is weighted by 2 for <i>RISK_TYPE</i>, 1 for <i>RISK_NAT</i>, 3 for <i>RISK_SPEC</i>, and 2 for <i>RISK_TIME</i>.</p>
<p>[...] Our acquisition strategies and integration of acquired businesses may not be successful. From time to time, we acquire additional businesses that we believe to be a strategic fit, such as our recent purchases of the Casa Herradura business, Chambord Liqueur and the remainder of Don Eduardo. [...] Excerpt of Item 1A of 10-K filing for the fiscal year ended April 30, 2007, by Brown-Forman Corp. (2007).</p>	<p>This expression provides qualitative information about a risk factor related to several specific current M&A transactions. Consequently, this M&A risk factor is weighted by 1 for <i>RISK_TYPE</i>, 0 for <i>RISK_NAT</i>, 2 for <i>RISK_SPEC</i>, and 2 for <i>RISK_TIME</i>.</p>
<p>[...] we may finance future acquisitions by issuing common stock for some or all of the purchase price which could dilute the ownership interests of the existing stockholders [...] Excerpt of Item 1A of 10-K filing for the fiscal year ended January 31, 2008, by Source Interlink Companies Inc. (2008).</p>	<p>This expression provides qualitative information about a risk factor related to future M&A transactions in general. Consequently, this M&A risk factor is weighted by 1 for <i>RISK_TYPE</i>, 0 for <i>RISK_NAT</i>, 1 for <i>RISK_SPEC</i>, and 1 for <i>RISK_TIME</i>.</p>