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The determinants of forward-looking risk disclosure and its impacts on firms' risk and analyst forecast accuracy: Evidence from the UK

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The determinants of forward-looking risk disclosure and its impacts on firms' risk and analyst forecast accuracy: Evidence from the UK

By

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A thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Accounting & Finance

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April 2015

Abstract

This thesis represents the first attempt, to the best of my knowledge, to obtain a deeper understanding of firms' forward-looking risk disclosure patterns, and their determinants from the perspective of corporate governance issues and ownership structure, and impact on firm risk and analyst forecast accuracy. In order to test these relationships, I manually coded a sample of non-financial institutions that were members of the FTSE100 and Mid-250 indices during 2010, as identified by Thomson Reuters.

Chapter 1 is the introduction of the whole thesis; it discusses the research background and motivation and briefly outlines theoretical development of risk disclosure research.

Chapter 2 investigates the determinants of forward-looking risk disclosure. I find that corporate boards with a higher presence of independent, non-executive directors, larger board sizes and higher audit committee effectiveness all contribute to more forward-looking risk disclosures. Conversely, share holdings by investment institutions and inside employees are negatively related to forward-looking risk disclosure.

Chapter 3 investigates the impact of forward-looking risk disclosure on firm risk. I report a significant negative association between the total quantity of forward-looking risk disclosure and level of firm risk; however, one standard deviation increase in disclosure only leads to a slight decrease of risk. The detailed risk construction reflects that more 'operational', 'good', 'quantitative' risks that are forward disclosed will impose stronger effects on reducing firm risk.

Chapter 4 investigates the impact of forward-looking risk disclosure on analyst forecast accuracy. I report a significant positive relationship between the quantity of forward-looking risk disclosures and analyst forecast accuracy; the reduction effect of forecast error appears strongest in the short-term horizon. In testing the relationship between forward-looking risk disclosure and analyst forecast accuracy, I control for earnings quality, the results show that there is a significant positive association between earnings quality and forecast accuracy. Additionally, earnings quality has long-term predictive power regarding earnings.

Chapter 5 is the conclusion of this thesis.

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Declaration

The material contained in the thesis has not previously been submitted, either in whole or in part, for a degree in this or any other institution.

Statement of Copyright

The copyright of this thesis rests with me. No quotation from it should be published without my prior written consent and information derived from it should be acknowledged.

Acknowledgements

First and foremost, I would like to express my profound gratitude and sincere thanks to my supervisors Dr. Aly Salama and Prof. Rob Dixon for their continuous encouragement, support and guidance during my PhD programme. Without them my life would be a totally different story. My supervisors gave me huge support when I experienced the hardest time in life; they offered me a life-changing opportunity to study with them and were always by my side. I received tremendous academic supervision in the past three years and a half, which inspired me to come up with good research topics and maintain high quality in writing my thesis.

I would also like to thank my college mentor Mrs. Eva Schumacher-Reid. She is a very kind and supportive lady and a great friend of mine. She offered me very generous help when I was desperate and depressed, and she encouraged me a lot to stand firmly and smile at the difficulties. Her optimistic attitude always inspired and encouraged me. I would always appreciate her selfless love and kindness.

Huge thanks goes to my mum, Mrs. Gongcui Wang. You're my dearest and most important person in my life, and the bravest woman in the world. Whatever I have achieved and will achieve in the future is because of your love and support. Words cannot express how much you mean to me and I will always work hard and make you proud.

A very special acknowledgement goes to my boyfriend Liu Pei, who loved and cared for me during my whole PhD study. We both started a PhD at approximately same time. Thank you for your understanding and your patience when I wrote my

thesis, and being a constant source of motivation and encouragement. You accompanied me during my long time of coding, writing and re-writing and even when I retreated to long days with my computer, both at home and in office, until midnights, weekends and holidays. Most importantly, you bring me happiness every day and have changed my life forever. Love you Dr. Cat.

Besides, I am grateful to Philip Linsley for his advice in coding risk disclosures, Prof. Simon Hussain for his cooperation in paper publications, and Prof. David Held for his useful job advices. I would like to thank all my friends I made in Durham, Dr. Michael Guo, Nan Hu, Laura Heintz, Yuyan Zheng, Ruirui, Hu, Dr. Junhong Yang, Dr. Yukun Shi, Kai Lisa Lo, Zhenlong Li, Yun Zhang, Xiehua Ji, Yujie Hu, Hala Alqobali, Dr. Ziwei Zheng, and a lot of other great friends, who accompanied me for the past few years. We supported each other like a big family.

To everyone else who is not mentioned here but contributed to my PhD study either directly or indirectly, I thank you all.

Chapter 1

Introduction

1.1. Research background and motivation

Corporate accounting malfeasance has obtained a place among the defining themes of the financial market over the past fifteen years, and has been widely criticised as having given rise to the 2007 financial crisis and related Occupy Wall Street movement. This section represents a chronological review of some of the worst incidents from the last decade and a half[1].

- 1998: Waste Management (a publicly-listed waste management company). The company (Waste Management) deliberately extended the depreciation period for their property, plant and equipment (PPE) and recorded $1.7 billion of false earnings in their financial statements. The company received a penalty of $457 million to settle a shareholder class-action suit.

- 2001: Enron (a commodities, energy and service company). The management wiped off massive debt from its financial statements and aggressively ramped

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[1] Source: "10 Worst corporate accounting scandals", by Barry Ritholtz, website: http://www.ritholtz.com/blog/2013/03/worst-corp-scandals/

up share prices; shareholders lost $74 billion and the company filed for bankruptcy.

- 2002: WorldCom (a telecommunications company, now known as MCI, Inc.). The management overstated company assets by as much as $11 billion, resulting in $180 billion of losses for investors; the company went bankrupt.

- 2002: Tyco (a blue-chip Swiss security systems company). The CEO and CFO pocketed $150 million and exaggerated reported earnings by $500 million. These senior executives siphoned off profits through unapproved loans and deceitful stock sales, and illegally peculated company money as their private bonuses or benefits. Typo was obligated to provide $2.92 billion to shareholders as compensation.

- 2003: HealthSouth (the largest publicly-traded health care company in the U.S.). The management (allegedly) overstated earnings by $1.4 billion in order to meet shareholders' expectations.

- 2004: Freddie Mac (a federally-sponsored mortgage-financing institution) . The company deliberately misstated and deflated $5 billion earnings on its books. The company received fines up to $125 million.

- 2005: American International Group (a multinational insurance company). The management committed substantial accounting fraud amounting to $3.9 billion, together with bid-rigging and share price inflation. In order to settle with a US Securities and Exchange Commission (SEC) investigation, the company paid $1.64 billion in fines.

- 2008: Lehman Brothers (a global financial service institution). The management illegally concealed over $50 billion loans by deceptive sales of

toxic assets to the Cayman Island banks. The fourth largest investment bank in US before 2008 filed for bankruptcy.

- 2008: Bernie Madoff (Bernard L. Madoff Investment Securities LLC). The management swindled investors out of $64.8 billion through the largest Ponzi scheme in financial history. Madoff's fraud was realised only months after the 2008 credit crunch.

- 2009: Satyam (an Indian IT services and back-office accounting company). The management inflated revenue by $1.5 billion. After falsified accounts were revealed, Satyam shares (NYSE) plunged from a peak of $29.10 in 2008 to around $1.80 in 2009.

These accounting scandals share some common characteristics: A lack of essential disclosures to investors (especially risk information relating to the overall operation of the company); senior executives allegedly involved in fraud, conspiracy and filing false documents with regulators; a lack of effective board monitoring due to insufficient board independence; incompetent and inefficient auditing system; inappropriate ownership structures (particularly regarding employees' shareholdings, which constitute a large proportion of their compensation packages and are closely connected to a firm's short-term stock performance); massive earnings manipulation (managers commonly inflated firm's finance accounts or deflated earnings) in order to conceal bleak profits and meet investors' expectations, or for hostile market expansion, or to avoid tax; and withering financial consequences to the firm that commonly led to massive fines to SEC regulators, huge lose for investors, bankruptcy or takeover.

A recent (and on-going) accounting story (August, 2014) of Tesco threw the world's third-largest retailer into turmoil and called out the media hounds regarding

the issue of corporate risk disclosure. Since the artificial inflation (by £250 million) of Tesco's half-year profit levels, £3 billion has been knocked off the grocer's stock market value, and its shares prices have fallen 40% (so far) to an 11-year low, accompanied by subsequent sales and profit warnings. Tesco faces twin probes by City watchdogs into this accounts scandal and may face UK parliamentary scrutiny. Tesco's finance chief stepped down with a £1m payoff before the accounting scandal came to light; Tesco has further suspended four senior executives as inquiries are launched into its profit overstatement. "Breaking accounting rules to exaggerate profits is a cardinal sin as far as investors are concerned and Tesco has been punished severely with shares falling more than 10% at one stage day"[2]. Tesco later explained the incident was "principally due to the accelerated recognition of commercial income and delayed accrual of cost". This could mean that Tesco intentionally violated the matching principal in accounting and put forward its revenue ('rebate') on an early date and pushed back its costs until a later date. These facts regarding the management's earnings manipulation signal a poor earnings quality that would impact financial analysts' evaluation of the company's market value. Tesco chairman Sir Richard Broadbent commented on the overstatement, saying that "things are always unnoticed until they have been noticed"; in doing so, he raised the concern of uninformed investors. The scale of the discrepancies which exposed in the leading British retailer has posed questions regarding the cause of the mis-statement of reported income, and whether asymmetric information between corporate insiders, outside shareholders and managers of this nature could trigger a devastating catastrophe for the company and lessen the confidence of financial analysts and investors.

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[2] Source: "Tesco suspends execs as inquiry launched into profit overstatement", website: http://www.bbc.co.uk/news/business-29306444

The unstable financial environment of recent years, in the post era of 2007 financial crisis, has placed risk disclosure under the close scrutiny of investors and regulators. A long-standing criticism of risk disclosures is that they lack transparency and are uninformative (Solomon et al., 2000). Even prior to the financial crisis, the issue of corporate risk disclosure was a significant subject at the American Accounting Association (AAA)/Financial Accounting Standards Board (FASB) conferences (from at least 1997 onwards), which identified that US firms were publishing inadequate risk disclosures in their annual reports. The Institute of Chartered Accountants in England and Wales (ICAEW) also expressed similar concerns regarding risk disclosure deficiencies and released three discussion reports (1997, 1998 and 2002) urging British firms to disclose more informative risk-relative information. "*Best Practice in Corporate Governance",* produced by the Turnbull Committee, exerted further influence upon internal control and risk management disclosures. More recently, Abraham and Shrives (2014, p.104) examine risk disclosures in a sample of large UK food producers and processors. They characterize these disclosures as being general in nature and little more than 'symbolic window dressing'.

There is now a growing attention on forward-looking disclosure in corporate annual reports. Recent regulatory approaches include: Companies Act (2006), and the 'best practice' issued by the International Accounting Standards Board (IASB, 2010). ICAEW (2011) stated the pressures from vast stakeholders who request more transparent disclosures in the wake of financial crisis.

Notwithstanding risk narratives are important, detailed empirical evidence from the academic community remains somewhat limited. Solomon *et al.* (2000) conduct a survey of UK institutional investors and find their common agreement that

managers should disclose more verifiable risk information instead of providing generalized statements of risk management policies. Following Solomon and colleagues' call for risk disclosure studies, Linsley and Shrives (2005) conducted a comparative study of 18 UK and Canadian banks and explored their risk narratives within their annual reports. They suggest that a potential utility of more voluntary risk disclosure is to reduce firm's cost of capital; they also propose that forward-looking risk disclosures could be valuable information source for investors. The latter point is in line with Dietrich *et al.*'s (2001) study that implies that forward-looking risk disclosures could play a role in improving market efficiency. In a later study, Linsley and Shrives (2006) examined risk disclosures for a sample of 79 UK firms. They report similar results regarding the merits and disadvantages of voluntary risk disclosures within annual reports.

A general consensus of the literature on risk disclosure studies holds that managers are reluctant to voluntarily release more than necessary forward-looking risk disclosures due to the high proprietary cost and legitimacy issues (Linsley and Shrives, 2005). Beattie *et al*. (2004) examine all narrative sections throughout the annual reports for 27 UK firms and finds merely 2.4% of whole sample units discussing forward-looking risk information, of which only 7% are quantified. Beretta and Bozzolan (2004) add to the body of literature by reporting that when explaining forward-looking risks, managers are not inclined to specify the risk impact with favourable or unfavourable statements. Recent studies state an increase in the level of narrative information released by companies over time (ASB, 2007 and 2009; Campbell and Slack, 2008). However, notwithstanding this increase, there appears to be limited interest among professional users of this information because of concerns about the quality/usefulness of forward-looking risk disclosure

(Campbell and Slack, 2008). "Where disclosure is non-specific, boilerplate, or merely describes a risk management policy, its use is limited" (Abraham and Shrives, 2014, pp. 92).

Against the background of more frequent and large scale accounting scandals, the present research considers the risk disclosure approaches for a sample of firms drawn from the UK's FTSE-100 and Mid-250 indices. I also reiterate previous findings identifying the vital role of governance characteristics, such as board composition and independence, audit committee effectiveness, and shareholder ownership structure in determining the extent and content of firm's risk disclosures. This research would also investigate the consequences of lack of risk disclosure in respect of its effect on firm risk and analyst forecast accuracy. It would also provide empirical evidence for a suggested connection between disclosures and earnings management.

Risk disclosure is essential to a wide range of information users including managers, investors, financial analysts, auditors and regulators. A broader definition of risk embraces both positive opportunities and negative uncertainties (Lupton, 1999; Linsley and Shrives, 2006). It includes financial risks that are associated with corporate financing and have an immediate effect on corporate assets and liabilities of a monetary nature; operational risks that directly impact the daily operation of the business, and those which firms are willing to pursue in order to achieve competitive advantages and increase value for shareholders; strategic risks that relate to macroeconomic or general social environment within which the firm operates (e.g., Cabedo and Tirado, 2004; Linsley and Shrives, 2006; Kravet and Muslu, 2013; Oliveira et al., 2011). Voluntary risk disclosures publicly detail the full operational status of a firm. Managers use risk disclosure as a relay for the transmission of their

risk management efficiency. According to signalling theory (Toms, 2002), the value of good practice in corporate operation cannot be realised unless it is signalled to stakeholders. When firms have applied strategic risk control strategies that aim at mitigating firm-specific threats and creating growth opportunities, managers are more likely to provide positive signals through voluntarily disclosing more risk information. Investors are the primary readers of firms' risk disclosures. In the classic principal-agent relationship (Jensen and Meckling, 1976; Watts and Zimmerman, 1986), investors are commonly perceived as being at an information disadvantage when managers selectively withhold (insider) critical risk information for various reasons: threats to their authorities, commercial sensitivities, and uncertainty over risk measurements. Therefore investors require more information to evaluate firm performance and make informed decisions. In addition, investors may be prohibited from supervising a firm's risk-controlling systems as the cost of gathering and analysing additional information is untenable. Financial analysts act as intermediaries between investors and managers; more risk information available put them in a better position to promote their earnings forecasts of target firms, buy and sell recommendations of selected securities and other forms of professional services to various investors in different needs. Policy makers also need firms' risk disclosures to evaluate firm performance and monitor managers' behaviour, to overhaul and standardize market order, and earnestly protect shareholders' rights and interests.

Risk disclosures inform readers of a firm's 'opportunities', 'prospects' or any 'hazards, threats or exposures', which have already impacted or may potentially impact firm value, and notify readers of managers' risk mitigation and opportunity creating strategies and internal control risk management policies. 'Risk' implies

possibilities and potentials. Risk can only be understood within a broader perspective of firms' operating strategies and macroeconomic environment. In light of this, the notion of risk and forward-looking information are "closely intertwined" (Beretta and Bozzolan, 2004). According to the information time-orientation, risk disclosures can be categorised into forward-looking risk disclosures (*FRD*) and past risk disclosures. The present research will focus on forward-looking risk disclosure, because existing risk disclosure studies have indicated the usefulness and value of forward-looking risk disclosure (e.g. Linsley and Shrives, 2005, 2006; Jorison, 2002; Soloman et al., 2000) - yet to the best of my knowledge no research so far has specifically investigated forward-looking risk disclosure nor provided empirical evidence regarding the usefulness of forward-looking risk disclosure in respect of its effect on firm risk reduction and analyst forecast accuracy. Forward-looking risk disclosure is defined as any risk-related information that informs readers about future potential opportunities or threats and uncertainties arising from the interaction of external macro-economic and market risks and internal operational risks, and about any descriptive information regarding internal control risk management policies. In order to thoroughly investigate the different characteristics of risk disclosure, I disaggregate total risk narratives into a few sub-categories: on the basis of their temporal focus (forward-looking, backward-looking); of their business focus (financial, operational, strategic); of their numerical nature (quantitative, qualitative); of their descriptive tone (good, bad, neutral).

I then make the following hypotheses to find the determinants (Chapter 2) and consequences (Chapter 3 & 4) of corporate voluntary forward-looking risk disclosures: in Chapter 2, I hypothesize a positive relationship between the volume of forward-looking risk disclosure and a board with higher presence of non-

executive, independent directors, larger board size and effective audit committee. Regarding the impact of ownership structure, I hypothesize a negative relationship between the volume of forward-looking risk disclosure and the extent of investment-institution-held shares and employee-held shares. Specifically, I find that forward-looking risk disclosure is significant positively associated with board composition (measured by the proportion of non-executive directors on a board), board independence (measured by the proportion of independent directors on a board), board size, and audit committee effectiveness (a composite measure of audit committee independence, size, expertise and commitment). Conversely, share holdings by investment institutions and inside employees are negatively related to forward-looking risk disclose. In Chapter 3, I hypothesize a significant negative relationship between the volume of forward-looking risk disclosures and firm risk, measured by beta. The results support the hypothesis. In particular, one standard deviation increase in risk disclosure only leads to a slight decrease of risk. And more 'operational', 'good', and 'quantitative' risks that are forward disclosed will impose stronger effects on reducing firm risk. In Chapter 4, I hypothesize that forward-looking risk disclosure is negatively associated with analyst forecast error. The results support the positive relationship and indicate that the reducing effect of disclosure on earnings forecast error appears strongest in the short-term horizon. In testing the relationship between the quantity of forward-looking risk disclosures and analyst forecast accuracy, I also control for earnings quality factor and find a significant negative association between earnings quality and forecast error. The results support the complementary and simultaneously impact of forward-looking risk disclosure and earnings quality on forecast accuracy.

I build on previous risk disclosure study and conduct a comprehensive forward-looking risk disclosure study for a UK sample; the results reveal that in the preparation of risk reporting, managers have a preference for discussing forward-looking risk information in a neutral tone. This supports Beretta and Bozzolan's (2004) findings regarding 85 Italian companies' risk disclosures in that, where future risks are disclosed, executives are reluctant to indicate whether the impact is likely to be positive or negative. The results also reveal that forward-looking qualitative risk disclosures occur significant more frequent than quantitative disclosures, in line with the findings from general disclosure studies (e.g., Kravet and Muslu, 2013; Campbell and Slack, 2008). In addition, I demonstrates a significant positive association between forward-looking 'good news' ('bad news') risk disclosures and the proportion of quantitative (qualitative) risk disclosures. This result suggests that companies like to firm up good news disclosures with quantitative disclosures but prefer words (qualitative) when making 'bad news' risk disclosures.

This research contributes to risk disclosure studies in the following aspects: firstly, it facilitates a broader understanding of the relationship(s) between disclosure and corporate governance ownership structure than has been recognized in prior research. The findings can explain the reasons behind the lack of disclosure in those accounting-scandal companies: non-effective corporate governance structures have resulted in poor monitoring by informed executives and inappropriate shareholding structures which have enabled senior executives to focus on short-term profits whilst sowing the seeds of future crises. This research should hopefully interest regulators and policy makers who advocate the provision of more transparent and timely risk disclosures in order to monitor corporate behaviour and regulate market competitive order to avert more accounting scandals. Secondly, I report a significant negative

relationship between the total number of forward-looking risk disclosures and firm risk. This adds to the existing literature relating to the benefits of improving the extent of firm risk disclosure. The detailed data construction in this research provides an effective way of improving investors' confidence through voluntarily publishing more operational, 'good news' and quantitative risk information. Investors, creditors and auditors will hopefully find the results reported in this thesis useful as they outline a measurement that can be used to assess firms' risk exposure. Accordingly, these readers can expand their exploration and verify the risks to target companies, and supervise and urge companies to improve the overall quantity of the forward-looking risk disclosures; in this way, readers of annual reports can also be better served. Thirdly, considering the essential role financial analysts play between internal managers and external investors, this research provides evidence that forward-looking risk disclosure can effectively lower earnings forecast error. The results provide empirical evidence regarding a common factor of accounting scandals – massive earnings manipulation (i.e. poor earnings quality), when firms deliberately falsely report earnings either to conceal earnings difficulties or to seize market share; critical problems are commonly unnoticed until they have been exposed. From the view of financial analysts, the findings in this thesis are relevant to the extent that investors incorporate analysts' earnings forecasts in their portfolio investment and respond to revisions of those forecasts; the results provide insights into understanding what role information risk plays in investors' decision-making. Fourthly, the methodology applied in this research is experimental: I build a complete set of key code words based on the UNIX perl code (Kravet and Muslu, 2013) then uses it to assist with content analysis. This approach decreases the subjectivity of content analysis whilst takes advantage of computer software's

mechanical nature. The bond of manual and computer-assisted content analysis provides a testable link for future risk disclosure studies.

1.2. Overview of theoretical perspectives on risk disclosure

I adopt a multi-theoretic approach to evaluate the findings presented in this thesis. This is common throughout the disclosure literature (Abraham and Shrives, 2014). This research favours stakeholder-agency theory, a resource-based view and quality signalling theory, alongside resource dependence theory.

Within the frame of stakeholder-agency theory (Hill and Jones, 1992), company's stakeholders refer to all resource holders, not only directors and investors, but also customers, suppliers, creditors, employees, local communities and the general public. No matter the size of their stake in the firm, each stakeholder represents one part of the nexus of implicit and explicit contracts that comprises the firm. Each entity can be viewed as a contributor to a firm's essential resources; in turn they expect the maximum risk-adjusted return. Managers serve the core of the nexus, and are the "only group of stakeholders who enter into a contractual relationship with other stakeholders, and are also the only group of stakeholders with direct control over the decision-making apparatus of the firm" (Hill and Jones, 1992, pp.134). Therefore, stakeholders request managers to be judicious and wisely allocate resources in a manner to protect profit benefits of various stakeholders. Similar to principal-agency theory, managers represent the agents of other stakeholders, bonded to broad institutional contracts. However, managers have the information advantage to obtain inside critical risk information and thus have the potential to twist facts when they are released to other stakeholders. This then

increases stakeholders' difficulty in identifying whether managers are acting in their (the stakeholders') maximum interests. The classic principal-agent relationship can be used to explain managers' discretionary behaviour in voluntarily disclosing a firm's risk information, and why accounting scandals are generally revealed very late and at a substantial loss to investors. The suggested response is for stakeholders is to demand more risk information than they are provided with within annual reports so as to monitor the contractual relationship, and/or better estimate the risk exposure of the firm and make informed investments as a result (Solomon et al., 2000). More voluntary forward-looking risks disclosures can reduce the asymmetric information risk and help improve a firm's accessibility to capital markets by reducing investors' expenses spent on collecting information. In addition, the market will better understand the company's position and perceive the company as less risky. Financial analysts act as intermediaries between investors and company managers: They provide professional services including earnings forecasts, buy/sell advice of selected securities to various brokers, individual and institutional investors. Firms' risk disclosure quantity is a determinant of analyst forecast accuracy since much of the information that analysts use in their estimations is sourced directly from firms (Lang and Lundholm, 1996). Increased firm-provided information means analysts have more valuable reports to sell. In addition, firms that voluntarily release more verifiable forward-looking risk information will find lower forecast standard deviation, more accurate forecasts and less variable forecast revisions. To the extent that analysts may be considered as representing or influencing investors' beliefs, high-disclosing firms may have a larger cluster of potential investors and less dispersion in their perception about firm performance.

As to the contents of forward-looking risk disclosures, both the resource-based view (Barney, 1991) and quality signalling theory (Toms, 2002) suggest that when a firm effectively apply valuable, rare, inimitable and non-replicable (VRIN) resources to implement threats mitigation and opportunities creation strategies that are difficult to imitate and substitute, a firm's risk controlling system can be improved; thus its competitive advantages are strengthened and its systematic risk will be deemed lower. This provides theoretical support for the findings reported in the thesis that when firms disclose more firm-specific operational, quantitative and 'good news' forward-looking risk information that competitors find hard to imitate, the value of strategic risk management can be transmitted to investors, and this will send a positive signal to the market and influence investors' risk perception of the firm.

Resource dependency theory (Pfeffer and Salancik, 2003) provides theoretical support regarding examining management's disclosure behaviour. Resource dependency theory characterizes a company as an open system, dependent on environmental change to obtain necessary resources to survive. Board characteristics (composition; independence; size), audit committee effectiveness, and ownership structure (institutional shareholding; employees' shareholding) are indicators of a firm's critical resources and are rational organizational responses to the conditions of firm's external environment. The main benefits that "resource-rich" directors can provide to firms include information and preferential access to resources and legitimacy. For example, Mizruchi and Stearns (1988) find the link between a firm's abundant financial resources and a highly presence of institutional investors on the board. In addition, a larger board with more independent outside directors can enrich the firm with critical competitive resources, provide constructive advices to the management, and contribute to a better monitoring system. Therefore, from a

signalling perspective, managers are inclined to voluntarily release more risk information as a signal to external shareholders that there is an effective risk management system. In most cases, managers have to simultaneously publish credible information to support this, as fraudulent disclosures will be penalised in the future.

Chapter 2

The determinants of forward-looking risk disclosure

2.1. Introduction

This chapter seeks to establish the relationship between corporate governance characteristics, shareholder ownership structure and voluntary forward-looking risk disclosure. I propose that board attributes such as board composition, independence and size, and audit committee effectiveness, alongside ownership structure are likely to impact managers' risk disclosing behaviour (e.g. John and Senbet, 1998; Jensen and Meckling, 1976; O'Sullivan, 2000; Higgs, 2003; Leung and Horwitz, 2004; Raheja, 2005; Adams and Ferriera, 2007; Zaman et al., 2011).

Disclosure literature has investigated the motivations of directors who voluntarily release more information than is compelled by law. These disclosed narratives exceed regulatory requirements and represent an option available to firm management for the provision of useful accounting-related and other information to assist the decision-making of external investors (Meek et al., 1995). Voluntary disclosures are subject only to managerial discretion, and managers may

intentionally publish favourable information to them, therefore the utility of such information to professional users remains undefined. While compulsory disclosure by regulation can be one possible solution to urge management publish objective true information that is consistent with the benefits of shareholders, however, there lack of evidence proving the benefits of compulsory disclosures (Healy and Palepu, 2001). Even if legislation approach is effective, concerns still remain about the content of mandated disclosure: what areas of information should be mandated? Therefore both internal and external monitoring mechanisms become necessary to ensure adequate information is published, including those regarding risks (Cheng and Courtenay, 2006). The focus of present research is to explore how corporate governance characteristics (internal monitoring mechanisms) and ownership structure (external monitoring mechanisms) impact management decisions regarding the release of forward-looking risk information.

Agency issues pose many risk disclosure challenges. When decision-making authority is granted to managers, they have an incentive to reduce risk reporting so as to cover real threats to their firm from stakeholders. For fear of being exploited by managers, stakeholders demand more disclosure regarding the risk management of their firm so as to evaluate managers' decision-making. To deal with agency problems, firms are obliged to adopt appropriate internal control mechanisms designed to monitor and authorize management decisions, and ensure effective risk management on behalf of stakeholders. Among these commonly used mechanisms are: board composition, board independence, board size, and audit committee effectiveness. It is suggested that good corporate governance (per the above attributes) are effective in reducing risk concealment and encourage more voluntary

forward-looking risk disclosures, above that mandated by regulation or stock exchange rules.

Within the framework of corporate governance, ownership structure is a principal concept, it gives guidelines to explain governance arrangements, including managerial power differential, board monitoring, finance and investment strategies and corporate disclosure approaches (Morck, 2000). It is posited that specific types of shareholder have various motivation, abilities and knowledge regarding risk disclosure discretion; however, little evidence presently exists within the literature. Extant research has used ownership concentration as a composite explanatory variable to explain the level of firm's disclosure, instead of trying to distinguish between different categories of shareholders, notwithstanding there are differences regarding the monitoring costs, and incompatible monitoring effects of various types of shareholders (Falkenstein, 1996). This study will focus on two specific forms of shareholder ownership: shares held by investment institutions and shares held by employees, so as to extend existing evidence on the impact of ownership categories on risk disclosure.

This research contributes to the risk disclosure studies in the following respects: First, it represents the first attempt in literature, to the best of my knowledge, that an extensive forward-looking risk disclosure analysis within all the narrative sections of annual reports, based on a comparatively large cross-sectional sample, has been conducted. I investigate the determinants of forward-looking risk narratives from the perspective of corporate governance issues and ownership structure. This adds to existing literature regarding the effect of board attributes and audit committee effectiveness and ownership by different shareholders on voluntary risk disclosure.

Second, the methodology adopted in this research is experimental; I build a complete set of key code words based on the UNIX perl code (Kravet and Muslu, 2013), and use this to assist manual content analysis. This approach decreases the subjectivity of content analysis and takes advantage of computer software's mechanical nature. This provides testable results for future risk disclosure studies. Investors, creditors and auditors will hopefully find my results useful as they provide evidence regarding how to improve corporate governance and optimize ownership structure, and suggest indicators by which to assess firms' risk exposure. Accordingly, they can expand their exploration, verify risk reporting policies in target companies, and urge companies to improve the overall quality of their forward-looking risk disclosures; in this way, readers of their annual reports will be better served. Moreover, this research will also interest regulators and policy makers who advocate the provision of high quality, transparent and timely risk disclosures.

The remainder of this chapter is structured as follows. Section 2.2 present theoretical arguments. Section 2.3 defines the forward-looking risks and develops the hypotheses. Methodology is discussed in Section 2.4. Model specification is discussed in section 2.5. Data collection is described in section 2.6. Section 2.7 presents the results. In the final section, conclusions are drawn and suggestions are made for future studies.

2.2. Theoretical approaches

2.2.1. Agency theory and signalling theory

Carpenter and Feroz (1992) suggest that overall exploration of disclosure theories is helpful as this provides richer insights into understanding corporate disclosure approaches; therefore, disclosure behaviour should be regarded as complementary rather than competing. Previous studies have applied stakeholder-agency theory, resource dependency theory and signalling theory to explain the determinants of corporate risk disclosure practices.

Morris (1987) states that the contents of agency theory is consistent with that of signalling theory, and a good combination of the two gives a better indication of firms' disclosure practices. Agency theory (Jensen and Meckling, 1976) states that corporate disclosures narrow the information gap between managers and shareholders thus ease the asymmetric information between the two groups. Managers have the incentive to publish inside information to meet the information requirements from outside shareholders. To much extend, disclosures are channels through which managers can demonstrate they are acting to boom firm value to the best of shareholders' interests. This represents a good signal to the market. In light of this, agency theory coincides with signalling theory. Signalling theory provides an explanation of managers' motivation to voluntarily release more information within annual reports (Haniffa and Cooke, 2002). Signalling theory states that mangers publish risk information in order to signal to outside investors that there is an effective risk management system inside the firm. In most cases, managers have to simultaneously publish credible information to support this, as fraudulent disclosures will be penalised in the future.

2.2.2. Resource dependence theory

Agency theory provides fundamental support to explain managers' discretionary disclosing behaviour; resource dependency theory however explains board's actions from another angle. Initially outlined by Pfeffer and Salancik (2003), resource dependency theory has now developed into a predominant theory in studies of organizational behaviour. Resource dependency theory states that the behaviour of an organization such as board's decisions on recruitment and dismissal and corporate disclosing approaches are a reflection of the resources it utilises. As Pfeffer and Salancik (2003, pp.1) indicate, "to understand the behaviour of an organization you must understand the context of that behaviour – that is, the ecology of the organization."

Board size and composition are generally regarded as two important indicators to assess one board's power to obtain vital resources into their firm. Firms reply on external resources to operate. A larger board enriches a firm's external resources: 1) information in forms of advice and counsel, 2) access to information channels, 3) preferential access to resources, 4) legitimacy (Pfeffer and Salancik, 2003). Dalton et al. (1999) find board size is positively associated with firm's financial performance. However, Boyd (1990) questions the quick conclusion might seem simplistic, he suggests that under certain circumstance a too large board can be redundant and inefficient, and only those truly "resource-rick" directors should represent the majorities seats. That is to imply merely numbers do not count, rather the type of directors are the real matters. The intake of resources need be matched to the needs of a company. Firms in highly regulated industries are likely to find more outside board members with relevant financial expertise (e.g. Luoman and Goodstein, 1999; Pfeffer and Salancik, 2003). Firms dependent on external financing have a higher proportion of institutional investors on the board (e.g. Stearns and Mizurchi, 1993).

Resource dependence theory suggests that non-executive directors procure external resources by their proficiency, prestige and networking (Haniffa and Cooke, 2002), they provide "additional windows on the world" (Tricker, 1984). Mace (1971) and Spencer (1983) argue that the role of a non-executive director should be advisory not decision-making, in that their experience and expertise are fully acknowledged, their advices are influential but they should not intervene the establishment of corporate policies. In short, non-executive directors enrich the board's expertise primarily through advice regarding strategic decision-making.

By such analogy, a larger board with the presence of more independent directors could enrich the firm with critical competitive resources, give constructive advices to the management, and contribute to a better monitoring system; therefore I could expect a correspondingly higher level of voluntary forward-looking risk disclosures.

2.3. Literature review and hypothesis development

2.3.1. Defining risk and forward-looking risk disclosure

Defining risk is the first step in conducting any risk disclosure study. Previous studies have provided two versions of risk definition. One view defines risk(s) as possible threats to a firm's wealth accumulation due to a series of internal factors (including 'financial risks' that can affect a firm's net cash flows and have an immediate effect on assets and liabilities of a monetary character and 'non-financial risks' which might have a potential impact on a firm's future cash flows) and external factors (related to the general environment in which a firm operates)

(Cabedo and Tirado, 2004; Kravet and Muslu, 2013). While this view solely incorporates negative outcomes when coding risk information, another definition of risk, which is generally regarded as a broad definition, embraces both positive opportunities and negative uncertainties (Lupton, 1999; Linsley and Shrives, 2006). Specifically, a sentence will be identified as risk-related if it conveys any indication of 'opportunity' or 'prospect', or any 'hazard', 'threat' or 'exposure', which has the potential to affect firm wealth, or inform the reader of specific risk mitigation and opportunity generating strategies and internal control risk management policies (Linsley and Shrives, 2006). This study will adopt the broad definition of risk when analysing risk disclosure information, which is consistent with Lupton's (1999) argument about how risk is used and recognized in colloquial language.

The second step is to define forward-looking risk disclosure. CICA (2001) released "guidance on preparation and disclosure" and defines forward-looking disclosure as the narratives to help investors better evaluate managerial decisions and strategic events and actions, targeted for corporate long-term returns. Beretta and Bozzolan (2004, pp.269) define forward-looking disclosure as: "(i) future events, decisions, opportunities, and risks that can have a likely effect on future results; (ii) visions, strategies, and objectives expressed by management; and (iii) explanations of past events, decisions, facts, and results that can have a significant impact on future results". A similar definition of forward-looking disclosure can be found in Aljifri and Hussainey (2007), who identify forward-looking disclosure as current plans and future predictions that allow shareholders and other stakeholders to evaluate a firm's future financial performance. This includes financial forecasts (e.g.,, earnings forecast) in the next year, expected proceeds and anticipated cash flows,

and non-financial forecasts like risks and uncertainties that might impact greatly on the expected achievements and results in any deviation from projected targets.

Consistent with previous literature, forward-looking risk disclosure in this study refers to any risk-related information that informs readers about future potential opportunities or threats and uncertainties arising from the interaction of external environmental and market risks and internal operational risks, and about any descriptive information concerning the internal control of risk management policies.

2.3.2. Board composition

Corporate boards are responsible for monitoring managerial performance in general and publishing risk information in particular. Previous empirical evidence suggests a set of board attributes that may influence the preparation and issue of firm risk information; these include: board composition, independence, size, and audit committee effectiveness.

The monitoring role of a board is generally believed to be determined by its composition, independence and size (John and Senbet, 1998). Since corporate disclosure policy is drawn up by boards, and the annual reports are composed by boards, the governance arrangements of the board of directors can be expected to influence risk disclosure approaches (Gul and Leung, 2004). Board composition is an interesting variable to consider, particularly in relation to the function of the non-executive directors on the board. If they are actively engaged with their monitoring role, then more voluntary disclosures can be expected. Moreover, their dominance of on the board may endow them with strengthened influence to urge the management

to publish more information, augment the information quality and reduce the benefits of withholding inside information (Fama and Jensen, 1983; Haniffa and Cooke, 2002).

Board composition refers to the percentage of outside board members over total board members; it therefore distinguishes non-executive directors from executive directors. Specifically, non-executive directors are those independent board members who are dedicated to reducing information asymmetry between managers and stakeholders (Donnelly and Mulcahy, 2008). They are viewed as corporate outsiders. Executive directors are full-time employees within the firm; they are counted as corporate insiders. Agency theory states that a board should encompass a variety of members (both insiders and outsiders); each has different propensity for disclosure style (Cai et al., 2006). Corporate insiders (executive board directors), in working alongside managers, may find it difficult to simultaneously monitor managers' behaviours (Fame and Jensen, 1983). Under the framework of agency theory, executive directors are less likely to voluntarily disclose more risk information, as their stewardship and strategic action can be exposed to more valid scrutinies (Leftwich et al., 1981). Comparatively, a board composed of more non-executive directors is in a stronger position to respond to shareholders' demands for accountability and transparency in disclosures. In Solomon and Solomon's (2004) survey of UK investors, share owners stress the significance of the presence of non-executive directors, and rank this group the most effective corporate governance control mechanism.

There are two arguments in the literature regarding this board composition issue: one supports the presence of more executive directors on the board; the other favours the presence of more non-executive directors.

Supporters of higher presence of more executive directors on the board raise the concerns for dominant non-executive directors: "stifling of strategic actions" (Goodstein et al., 1994), "excessive monitoring" (Baysinger and Butler, 1985), "a lack of business expertise" (Patton and Baker, 1987) and "a lack of real independence" (Demb and Neubauer, 1992).

Those who favour the presence of more non-executive directors on the board apply 'principal-agency theory' and 'resource dependency theory' to support their argument. Principle-agency theory states that corporate board is an essential monitoring tool to control managers' illegitimate actions (Jensen and Meckling, 1976). Non-executive directors' monitoring initiative are driven by complex motivations, derived from their directorship responsibility and boosted by their share ownership (Mangel and Singh, 1993). Resource dependency theory indicates that non-executive directors enhance board's strategic decision-making, and could ease "managerial consumption of perquisites" (Brickley and James, 1987). They are not easily coerced by CEOs (Weisbach, 1988) and are impartial in the nomination of board directive members (Pettigrew and McNulty, 1995). In other words, non-executive directors reduce the power differentials among board members and impel the whole board to fufill their duty as representatives of outside shareholders (O'Sullivan, 2000; Mallin et al., 2005).

A number of international studies have investigated board composition as a determinant of firm's voluntary disclosures and report different results. Ajinkya et al.

(2005) examine the US market and find a higher presence of outside directors on the board leads to more management earnings forecasts, and these forecasts tend to be more specific, accurate and less optimistically biased. Arcay and Vazques (2005), Cheng and Courtenay (2006), and Lim et al. (2007) all report a significant positive relationship between boards composition (percentage of independent directors presence) and disclosure volume in Spanish, Singaporean and Australian markets respectively. However, Ho and Wong (2001) and Haniffa and Cooke (2002) study Hong Kong and Malaysia markets respectively but fail to find non-executive directors contribute to more informative disclosure. Eng and Mak (2003), Gul and Leung (2004), and Barako et al. (2006) find higher presence of non-executive directors on the board leads to lower disclosure volume based on empirical studies of Singapore, Hong Kong, and Kenya markets respectively. This significant negative relationship can be explained by "hegemony theory" which indicates that a board's passive behaviour is attributed to their dependence on information and insights that are provided by the company's top executives (Kosnik, 1987), or because of board interlocks (the number of multiple directorships some directors hold), board members have little time to carry out their duties effectively (Lin, et al., 2003).

Empirical studies report conflicting results regarding the determinant of board composition on corporate disclosure approaches. This is largely due to the sample selection bias. Nevertheless it is generally consensus that non-executive directors play a critical role in effective administration and monitoring. And better monitoring lead to more transparent and informative disclosure available to general public. Therefore I have the first hypothesis:

H_{1a}: There is a positive association between the proportion of non-executive directors on a board and the volume of forward-looking risk disclosure.

H_{1b}: There is a positive association between the dominance of non-executive directors ($\geq$ 50%) on a board and the volume of forward-looking risk disclosure.

2.3.3. Board independence

A higher proportion of non-executive directors on the board could help improve the accountability and transparency of corporate risk disclosure; however, not all non-executive directors are alike. A non-executive director may be independent or dependent director. Dependent non-executive directors may have material pecuniary relationship or transactions with the company (refer to grey areas), they are not completely independent of management, there being a deal or other caveat that could possibly affect their impartial decisions (Mallin et al., 2005). Comparatively, independent non-executive directors are apart from management, and are a key factor in assessing corporate governance quality (Higgs, 2003). The notion of board composition and independence are closely intertwined, as board independence is augmented when the presence of independent non-executive director on the board increases.

Board independence is defined here as the percentage of independent directors on the board over total board directors. According to the Combined Code (1998), independent directors refer to those who have no material monetary connection to management except their payments and shareholdings, and no connections or history

that would affect their independent decision-making. However, due to the limited information from the published board members' resumes in annual reports, it is hard to distinguish strictly independent board members (no material monetary relationship with management) from those who are affiliated with management by family ties or business connections ('grey' directors). In this study, I define independent board members as "belonging to a group not employed by the company, not representing or employed by a major shareholder, not having served on the board for more than ten years, not a reference shareholder with more than 5% of holdings, having no cross-board membership, nor recent or immediate family ties to the company, and not in acceptance of any compensation other than compensation for board service". Although there is no existing theory with reference to the monitoring role of 'grey' directors on the board, previous studies find high proportion of 'grey' directors on the audit committee are less likely to make independent judgment (Carcello and Neal, 2000). The finding is in line with the argument that a board's monitoring effectiveness can be enhanced when strictly independent directors occupy more seats on the board.

Based on Williamson's (1984, pp.1219) transaction-cost framework, the main function of a board is "to provide governance protection to the stockholders, and that voting representation on the board should include those constituencies with exposed residual claims that cannot be safeguarded by either arms-length market transactions or other bilateral arrangements (e.g., loan covenants). Thus, shareholders, as the risk beneficiaries, need representation on the board that is independent of management to shield their poorly defined assets from expropriation". He further states "the specificity of asset transactions may create information asymmetries that can be mitigated by disclosure. Such disclosure provides greater transparency and enables

investors to better anticipate future transactions for valuation purposes. Such disclosure is selective, the board is instrumental in constructing additional checks against managerial concealment and distortion, such as audit and other committees composed of independent directors" (Williamson, 1984, pp.1221).

However, empirical studies generate mixed results of the impact of board independence on firm's disclosure approaches. Ho and Wang (2001) find an insignificant association between the quantity of voluntary disclosure and board independence. Eng and Mak (2003) and Gul and Leung (2004) both report a significant negative relationship between the volume of voluntary disclosure and board independence. These results contradict the principles of Williamson's (1984) framework and the notion that greater board independence leads to better monitoring more transparent disclosures. However, Eng and Mak's (2003) and Gul and Leung's (2004) research data is ahead before the Asian financial crisis and can be affected by the resultant appeal for improved corporate governance and disclosure transparency. Moreover, Eng and Mak's (2003) definition of independent board does not exclude 'grey' directors, and their unexpected results may be largely due to the oversight in failing to distinguish 'grey' directors from other independent directors. While Gul and Leung's (2004) research tries to explain the ambiguity of 'grey' directors on board monitoring, their unexpected results may be attributed to using a 'noisy' variable of director expertise (proxied by multiple directorships), which has been found to be significant negatively related to firm value.

Conversely, Beasley (1996) find a positive relationship between board independence and disclosure quality and states that an independent board (with a higher proportion of independent directors on the board) is less likely to commit

accounting fraud. Chen and Jaggi (2000) report similar results in their study of firm's mandatory financial disclosures and the board composition of independent non-executive directors. Leung and Horwitz (2004) find board independence has a significant positive effect on the extent of voluntary disclosure, on the condition of low director ownership (below 25%).

However, little attempt has been made to examine the effect of board independence on firms' risk disclosures regarding future orientation. Based on the theoretical framework of Williamson's (1984) and the empirical evidence of board independence on board's monitoring effectiveness, I have the second hypothesis:

H_{2a}: *There is a positive relationship between the proportion of independent directors on a board and the volume of forward-looking risk disclosure.*

H_{2b}: *There is a positive association between the dominance of independent directors (≥ 50%) on a board and the volume of forward-looking risk disclosures.*

2.3.4. Board size

In view of board independence, board size is a notable factor that can influence board activity and, potentially, approaches to disclosure. Previous researchers found board size could impact on the effectiveness of board activity. Board serves two main roles: advising and monitoring (Raheja, 2005; Adams and Ferriera, 2007). Advising refers to providing professional advices to management through accessing essential information and resources (Fama and Jensen, 1983). The benefit of a larger board is that such a board is more likely to possess a greater quantity of collective information and therefore is better-equipped to release more information. In view of

board structure, a larger board takes in more independent non-executive directors, which enhance the decision-making of the board as they will suffer from reputational loss once the firm is caught in accounting scandals or runs into financial constrains (Eisenberg et al., 1998). This argument draws support from resource dependency theory, in that larger board size helps to reinforce the connection between a firm and its outer environment and contributes to the procurement of essential resources (e.g. prestige and legitimacy) (Pearce and Zahra, 1992). A healthy, functional board enriches a firm with competitive resources, provides constructive advices to the management, and these benefits will lead to better firm performance and, resultantly, help decrease firm risk. Managers then have more incentive to highlight their superior performance through voluntarily publishing more risk news; especially news concerning future perspectives, and forward-looking risk disclosures.

Secondly, a board serves the role to discipline managers' behaviour and dismiss fruitless managers, in order to make sure managers work for the benefits of shareholders. Again, the advantage of a larger board is that more collective information is held by such a board - which is valuable in respect of its monitoring function. Empirical evidence show that a larger board size could augment management efficiency by reducing CEO autocracy together with thwarting their attempts to exploit shareholders (for example: adopt golden parachute contracts for soft landing regardless firm performance in their tenure) (Singh and Harianto, 1989). On the other hand, in order to fulfil their monitoring responsibilities, shareholders require sufficient, time-efficient, and transparent information from inside a firm. When the board monitoring effect improves as board size increases, it can be expected that an increase in voluntary risk disclosures will follow. Therefore, I have the third hypothesis:

H₃: There is positive association between board size and the volume of forward-looking risk disclosure.

2.3.5. Audit committee effectiveness (*ACE*)

2.3.5.1. The role of audit committee

Board members are committed to represent the interest of shareholders, while audit committees serve a particular function: they are independent form the management, to ensure corporate disclosure is sufficient and transparent. Financial Reporting Council (FRC) released "Guidance on Audit Committees (2012)", and clarifies the role of an audit committee: it should inform the board of any big financial reporting issues and explain the draw-up of a company's financial statements and all narrative statements. An audit committee should review published information in annual reports, including both the compulsory disclosure (financial statements, notes to the financial statements) and voluntary disclosure (chairman's statement, operation and performance review, corporate governance statements relative to firms' risk management systems and strategies). Within the narrative sections, audit committee should review the content of published information and inform the board as to whether the released information is generally fair, unbiased, and easy to understand, and whether sufficient information are available to shareholders to evaluate the company's performance, strategic model and management. The audit committee need to ensure that voluntary disclosures in narrative sections are consistent with the accounts, to avoid surprises lurking in the financial statements. Compared with the firm's management, who are responsible "for the identification, assessment, management and monitoring of risk, for developing, operating and monitoring the

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system of internal control and for providing assurance to the board that it has done so…the audit committee should receive reports from management on the effectiveness of the risk management systems they have established and the conclusions of any testing carried out by internal and external auditors" (FRC, 2012, pp.8). An audit committee should reassess and back up the accountability of risk management and internal control statements. Considering the above responsibilities of audit committees, suggested to ensure consistency with corporate governance best practice, it would be negligible to fail to acknowledge the essential role played by audit committees in ensuring the disclosure of sufficiently reliable and time-efficient risk information, either in compulsory financial statements, required to comply with specific rules and regulations, but also in the narrative reporting sections within the annual report. For this reason, I include audit committee effectiveness as a particular factor in assessing firms' risk disclosing issues.

2.3.5.2. Audit committee independence

The FRC (2012) Guidance on Audit Committees addresses the importance for an effective audit committee to be comprised by entirely independent non-executive directors. Independent directors are commonly believed to be impartial on corporate reporting, internal control strategies, and disclosure practices. Hudaib and Cooke, (2005) find an independent audit committee is effective in lowing the frequencies of accounting fraud and earnings management. DeZoort and Salterio (2001) suggest that when a reporting disagreement happens, an audit committee with more independent members is prone to appreciate and identify the risks auditors are facing in confronting management. Conversely, non-independent audit committee members

with current or previous directorship experience may be biased toward executive directors and therefore be more likely to identify with management decisions. Therefore, when an audit committee is composed of entirely independent non-executive directors, it will be in a stronger position to request greater audit scope to enhance audit quality. In this way, firm's disclosure level is expected to increase.

In this chapter, I define an independent audit committee member as not current and previous employees, not relatives of executives, and not on the payroll of the firm (apart from directors' fees); "excluding directors who are partners in, controlling shareholders, or executive officers of any for-profit business organization to which the firm made or from which the corporation received significant payments in the last five years. Compensation committee interlocking directorships are also excluded" (Blue Ribbon Committee, 1999).

Empirically, Abbott et al. (2004) summarize two reasons to explain why audit committee members' independence relates to their monitoring effect. Similar to the arguments of board independence, independent audit committee members have no family tie or monetary financial reputation to management, to ensure they take impartial actions and won't harm the firm for personal interests; furthermore, an independent audit committee member suffers from grievous reputation loss if an audit miscarriage is found out as they violated their violated their financial reporting oversight role. Investors respond promptly to the accounting scandal and cause tremendous damages to the firm. Abbott and Parker (2000) find that the experience of sitting on an audit committee can greatly improve a director's reputation as a financial monitor, however threats also increase for his reputational impairment if a reporting scandal is revealed during his tenure on the audit committee.

Abbott et al. (2004) indicate that audit committee independence improves its monitoring effectiveness therefore can improve the quantity and quality of financial reporting. Independence allows an internal audit to be conducted more smoothly and objectively inside the firm, since an internal audit's independence is an essential feature in reducing reporting misstatement. In addition, an entirely independent audit committee expand external audit scope to avoid getting involved in accounting misstatement, therefore will urge the management to release more risk information.

The above arguments imply that audit committee independence can have a positive impact on firm's disclosure approach. I therefore expect an audit committee comprised of entirely independent non-executive directors lead to more forward-looking risk disclosures.

2.3.5.3. Audit committee size

Bedard et al. (2004) find that audit committee size has a positive influence to reveal and resolve hidden problems during the process of financial reporting, because it is more likely to draw upon the strengths and range of insight and expertise available to ensure effective monitoring. This proposes that audit committee size is integral for companies who seek to issue meaningful corporate reports (Klein, 2002). The FRC (2012) requires an audit committee to "include at least three members, and at least one of them to have recent and relevant financial or accounting expertise". This requirement is intended to promote the audit committee's authentic power inside an organization.

Abbott et al. (2010) suggest that the internal audit function is consistent with the objective of the audit committee, it can be strengthened along with enhanced authority of audit committees. When the organization status of an audit committee improves, it alleviates managers' cost control pressures of internal audit (Rittenberg et al., 1999). The enhancement in internal audit function, together with the alleviation of managers' cost restraint pressures, help audit committees improve the quality of internal controls and may subsequently reduce the incidence of financial misstatements. Collectively, these factors could lead to increased risk disclosures and I expect FRC's requirement for audit committee size (at least three members on board) could contribute to higher level of forward-looking risk disclosures.

2.3.5.4. Audit committee expertise

In order to enhance the effectiveness of audit committee, the *Guidance on Audit Committees* (2012) recommends that at least one member of the audit committee should have recent and relevant financial expertise and desirably have a professional qualification from one of the professional accountancy bodies. In early 1999, Blue Ribbon Committee regarding the effectiveness of audit committee (pp.26) emphasized an audit committee should obtain both the 'financial literacy' (defined as "the ability to read and understand fundamental financial statements") and 'expertise' (defined as "previous employment or professional certification in accounting or finance, or comparable experience including service as a corporate officer with financial oversight responsibility"). Financially-conversant committee members can fulfil their monitoring roles more efficiently in the process of financial reporting, such as settling the complexities of financial reporting, identifying and resolving

material misstatements (Abbott et al., 2010) and decreasing the incidence of accounting restatements (DeFond et al., 2005). Moreover, there is evidence that those acquainted with reporting and auditing profession audit committee members who also have governance experience are better at understanding auditors' judgments and supporting auditors when auditor-management disagreements happens than those members who lack such relevant knowledge (DeZoort and Salterio, 2001). Specifically, DeZoort and Salterio (2001) state that in the establishment of corporate reporting policies, audit committee members need be acquainted with regulatory requirements of auditing. Financial expertise enables them to understand auditor's responsibility of explicit reporting, and to cognize the seriousness and appropriateness of being an auditor, therefore improving the quantity and quality of risk reporting, and internal controls related to risk management. Empirically, Abbott et al. (2004) find audit committee expertise (at least one audit committee member need be acquainted with financial professions) could significantly reduce the incidence of financial restatement. Krishman (2005) reports that audit committee expertise leads to less frequent internal control incidences. Studies of audit quality find that the power of an audit committee can be impaired or weakened if no one on the committee has recent financial expertise (Turley and Zaman, 2004; DeZoort et al., 2002). Thus, audit committee expertise can be expected to positively impact on audit quality, and extend audit scope and as a result improve voluntary forward-looking risk disclosures. Hence, I hypothesize audit committee expertise has a significant positive impact on the volume of forward-looking risk disclosure.

2.3.5.5. Audit committee diligence

In order to function effectively, audit committee members need to devote enough time and effort to carry out their responsibilities. Committee meetings assemble audit committee members to discuss disclosure quality issues. The frequency of committee meetings can indirectly reflect audit committee diligence and has been related to a reduced probability of accounting fraud (DeZoort and Salterio, 2001), so it is commonly considered as a character of committee activity (Zaman et al., 2011). The monitoring effectiveness of an audit committee is augmented by the frequency of committee meetings during the year; internal and external auditors are expected to meet frequently to discuss audit issues in a time-efficient fashion (FRC, 2012).

Empirical results suggest that more frequent audit committee meetings can improve risk reporting in two ways. First, frequent meetings with internal auditors keep committee members updated of accounts and other audit issues. When a significant reporting issue arises, they react quickly and mobilize relevant internal audit resources to resolve the issue. Secondly, regular committee meetings could mobilize extra external audit resources in addressing emergent reporting issues swiftly (Abbott et al., 2003). These benefits shorten audit time in the year end thus relieve the pressure of auditors in this particular time of the year, which improve external audit quality and decrease the possibility of accounting restatement, as audit committee members are more likely to detect and correct misstatement before the public release of annual reports (Abbott et al., 2004). Based on the above argument, I can propose that active audit committees can positively extend audit scope and reinforce internal control, then improve the extent and content of risk disclosure. Therefore I hypothesize that audit committee diligence could positively impact on the volume of forward-looking risk disclosures.

I follow Zaman et al.'s (2011) approach and use 'a composite measure of audit committee effectiveness' which comprises audit committee 'independence', 'expertise', 'diligence (frequency of meetings)' and 'size'. The joint effect of these four dimensions also reflects the recommendations of the *Guidance on Audit Committees* (2012, pp. 3-4) by Financial Reporting Council: "the board should establish an audit committee of at least three, or in the case of smaller companies two, independent non-executive directors; the board should satisfy itself that at least one member of the audit committee has recent and relevant financial experience; sufficient time should be allowed to enable the audit committee to undertake as full a discussion as may be required". In this chapter I assign a dummy 1 to the company if it fulfils all these characteristics and 0 otherwise. Dummy 1 refers to an effective audit committee, while dummy 0 refers to an ineffective audit committee. I have the following hypothesis:

H4: There is a positive relationship between the audit committee effectiveness and the volume of forward-looking risk disclosure.

2.3.6. Ownership structure - Outside investment-institution-held shares

While the monitoring role of the board is well-examined, prior literature also propose the role of shareholders on monitoring managerial discretion. Investment institution is a major type of shareholder, characterised with intensive (large stake) of shareholdings. I use the proportion of shareholdings by investment institution as a proxy for strength of external investors.

Investment-institution-held shares refer to 'the percentage of total shares in issue held as long-term strategic holdings by investment banks or institutions seeking a long-term return'. Bushee and Noe (2000) describe long-term investment institutions as "dedicated" investors, characterized as possessing large stable stakes with a low portfolio turnover strategy. Because of their large, stable ownership position, those major shareholders usually have the advantage to obtain inside information about their invested companies. Meanwhile, these institutional investors have superior profit-making abilities to interpret the implications of public signals; as a result, voluntary disclosure is of little utility to monitor corporate management and may cause high proprietary cost. Specifically, profitable trading opportunities could be lost if more forward-looking disclosures provide an alternative resource for inside information. In addition, dedicated institutional investors do not trade regularly; the liquidity benefits of securities trading due to more disclosures are no priority to them than to other investors. In light of this, dedicated institutions are likely to be unconcerned about disclosure approaches or may even prefer firms with less impending disclosure. Based on these arguments, I have the fifth hypothesis:

H_5: There is a negative association between the extent of Investment-institution-held shares and the volume of forward-looking risk disclosures.

2.3.7. Ownership structure - Inside investment employee-held shares

Employee-held shares are defined as those strategic share holdings of 5% or more held by inside employees, or by individual investors. These salaried employees get paid to manage corporate assets and generally work for the wealth of employers (Gimbel, 2003). These employees with strategic shareholdings are found to bear

lower job threat and immerse in the same culture and values of the firm like other employees. Accordingly, shareholdings by inside employees is planned for a long-term horizon. This stable and lasting investment strategy is found to generate the lowest portfolio turnover compared to any other class of investors. Previous work has found some investment employees do not sell their stakes after multiple years' waiting (10 years or more) (Ryan and Schneider, 2002). This long-term strategic planning enables inside investment employees, perhaps more than any other class of institutional investor, to seek a significant level and depth of inside information before realising their investment. Their understanding of proprietary information is augmented by comparatively frequent and intensive contact and communication with invested firms (Ryan and Schneider, 2002). Considering investment employees have their advantage to obtain both published and non-material private information, they have a preference for those firms which voluntarily release less information because of proprietary cost conerns. I therefore have the sixth hypothesis:

H₆: There is a negative association between the extent of employee-held shares and the volume of forward-looking risk disclosures.

2.3.8. Other influential factors

2.3.8.1. Size

Healy and Palepu (1995) suggest that the optimal disclosure level of a firm is decided by comparing the benefits of disclosure (particularly capital market benefits) to the costs of disclosure (particularly proprietary and litigation costs). Every firm is unique in character, therefore costs arising from generating the information and the

benefits obtained when more information becomes available will be different. Therefore concerning the reporting style, the narratives and accounts in the annual report vary according to corporate specific characteristics, and firm size is a particular feature to consider. Extensive empirical studies indicate that firm size retains an important role in determining firm's disclosing styles. They suggest several reasons for the influence of size on a firm's risk disclosure level. First, more voluntary informative disclosure is comparatively cheaper for larger firms because that information might have been prepared this information ready for internal use. While smaller firms face difference situations, due to limited public and press information, annual reports are the main information resources for competitors, so they may be more reluctant to provide comprehensive view of their operations. Disseminating information can be more costly for smaller firms because the media are prone to centre on and publish news relating to large firms. Second, larger firms are more likely to be scrutinized by government and regulatory authorities, and are expected to report more information so as to ease undesired pressure from the market. Third, in view of cost of capital, larger firms have more funding requirements from external capital markets while smaller firms don't. Increasing the release of voluntary risk information may help them gain investors' confidence and increase share liquidity, which will subsequently smooth financing difficulties and reduce the cost of capital (e.g., Donnell and Mulcahy, 2008; Abraham and Cox, 2007; Linsley and Shrives, 2006). Larger firms are particularly aware of the benefit in financing (Donnelly and Mulcahy, 2008). Therefore, firm size is included as a control variable in my study with a positive association expected in relation to the quantity of forward-looking risk disclosures. Previous studies have adopted different measures of firm size including turnover, total assets, market capitalization and employee

numbers. Since there is no theoretical agreement on the preference of one measure to the others, this study will measure firm size (*SIZE*) by the natural logarithm of total number of employees.

2.3.8.2. Profitability

Prior studies have not reached general consensus on the relationship between firms' profitability and the volume of voluntary risk narratives. One View states that a firm's profitability is positively associated with its disclosure level. In a financially healthy firm, managers have a greater motivation to release more information as this may increase investors' confidence that in turn raises the value of management compensation. Signalling theory also supports this argument; it posits that profitable firms have more incentives to voluntarily release more information in the annual reports as a favourable signal of their superior performance (Wallace et al., 1994). Conversely, if a company fails to disclose enough risk information, some negative consequences might arise. For example, stock price volatility is commonly considered as a consequence of information insufficiency. With lack of information available to investors, it increases the difficulties to precisely assess future payoffs and the relative risk level with the investment. Other consequences may include higher cost of capital (Botosan, 1997) and higher interest rates. Eventually, the information asymmetry between external investors and internal management may increase the risk of excessive inside trading that disheartens investors. Regarding the negative effects, firms may find it more desirable to voluntarily publish more forward-looking risk information.

Alternatively, there are issues that can discourage management to voluntarily disclose risk information. Some firms are tentative to conceal risk disclosures when firms reach a high level of performance, in order to maintain advantageously competitiveness.

Based on the above argument, I include firm profitability as a possible contributor to firms' forward-looking risk disclosure practices, but in no certain direction. Relative profitability is measured in this study via return on assets (*ROA*).

2.3.8.3. Liquidity

Signalling theory suggests that firm liquidity is positively associated with corporate disclosure levels. Compared with their peers in competing firms, a firm with high liquidity ratio is likely to release more risk information as disclosures provide them a useful means to demonstrate their expertise in handling liquidity risks compared with those with lower liquidity ratios. In addition, Jensen and Meckling (1976) maintain that firms with high liquidity ratios bear high monitoring fees. They may want to reduce the monitoring costs by disclosing more information in their annual report narratives.

Concerning the utility of disclosure, empirical evidence presents mixed results. For instance, Graham et al. (2005), and Marshall and Weetman (2007) find that firms with high liquid ratios are prone to provide more voluntary information. Wallace et al. (1994), however, document a negative association between the two variables. However, Wallace and Naser (1995) and Owusu-Anash (1998) both report a

insignificant relationship between firm's mandatory disclosure level and the liquidity ratio.

As a result, I control for firms' liquidity as a potential variable that may impact a firm's forward-looking risk disclosures. Liquidity is measured by current ratio, using total current assets to total current liabilities.

2.3.8.4. Leverage

According to agency theory, firms with more leverage are generally experiencing higher monitoring costs (Ahmed and Cmytis, 1999). Jensen and Meckling (1976) indicate that firms' information asymmetric problem can be reduced through the way of disclosing more information to their creditors, thus reducing the costs. In addition, providing more internal risk management information by managers can be viewed as a signal of their ability to fulfil the firm's obligations to debt-holders. Empirical evidence regarding an association between a firm's gearing level and risk disclosures is mixed. Some studies have observed positive effects of leverage to risk disclosure (e.g., Marshall and Weetman, 2007; Deumes and Knechel, 2008; Hassan, 2009), while others have found no relationship between them (e.g. Linsley and Shrives, 2006; Abraham and Cox, 2007; Rajab and Handley-Schachler, 2009).

Resultantly, I control for firms' leverage as a potential variable that may impact a firm's forward-looking risk disclosures. I measure firms' leverage level using total debt over total capital.

2.4. Methodology

2.4.1. Measure Disclosure Quantity

Content analysis has been widely used in accounting disclosure research to identify the presence of a theme in verbal reports and other written materials, additionally it allows disclosures to be systematically categorized and compared (Rajab and Handley-Schachler, 2009). This chapter adopts this methodology mainly because risk disclosure, particularly regarding non-financial categories, is mostly disclosed qualitatively and content analysis facilitates coders to measure the volume and the extent of that disclosure information.

In content analysis, researchers use different counting measures, including words, phrases, sentences, pages and number of lines. In a previous research, Hussainey et al. (2003) adopt automated text recognition software to count risk-related keywords in corporate annual reports. Gietzmann (2006) uses the raw disclosure data from the London Stock Exchange's Regulatory News Service, which he argues provides timely information that is date and time stamped, can be categorised by topic, and allows for the calculation of additional disclosure measures. Rather than directly counting words and phrases in previous studies, our research measures the volume of forward-looking risk disclosure by reading, recording and categorising risk-related sentences, as the latter coding method is widely recognized as more accurate than the former one. This method requires I to read through all the narrative sections of annual reports and identify all sentences containing risk-related information. Sentences will be coded as relating to risk disclosure if they include indicators of risks (any reference to an "opportunity", a "prospect" or a "hazard, threat or exposure") (Cabedo and Tirado, 2004). The word "risk" does not need to

appear for the sentence to be recognised as a risk disclosure sentence. Hussainey et al. (2003) indicate that during the coding process, some sentences may be categorised as past disclosure while they also contain information that is relevant to the future. For example, a sentence might indicate that the Research and Development (R&D) branch of a firm increased its budget by 10% in the preceding accounting year. This information goes beyond the disclosure category, however; it also conveys meaning in that increased investment in R&D is expected to increase that firm's future cash flow. In the coding process, final decisions concerning time orientation will be based on whether the sentence delivers information that would impact on the future or alludes to actions that will continue in the future operations of the firm. This research acknowledges the semantic ambiguity in the coding process, and uses verb tense to categorise the time orientation of risk sentences.

In the implementation of content analysis, some basic elements need to be clarified: the research question (measuring the volume of forward-looking risk disclosure and associating it with corporate governance characteristics and ownership structure); the document being coded (Corporate Annual Reports 2010); the coding unit (sentence); and the coding procedure (manual). Last, the coded information will be subjected to interpretation by the researcher (Rajab and Handley-Schachler, 2009).

As to the location of risk information, previous studies of American companies (eg., Beretta and Bozzolan, 2004) find such information to be spread throughout the notes on financial statements and the report on Management Discussion and Analysis (MD&A). In the UK sample, the Operating and Financial Review (similar as MD&A, but non-mandatory) is the main source of narrative risk disclosure. The

Combined Code on Corporate Governance, published by the London Stock Exchange in 1998, demands that listed companies maintain an effective internal control system and clearly explains risk management policies in the Corporate Governance section. This research will look at all voluntary narrative disclosures within annual reports, which includes Directors' Reports, CEO/Managing Directors' Report, Chairman's Report, Review of Operations, Principal risks and uncertainties, Corporate Governance (Internal Control and risk management). Remuneration, board independence and/or other corporate governance issues are not considered; Corporate Social Responsibilities (personnel, health and safety) are considered, so as to identify risk information (O'Sullivan et al., 2008).

The dependent variable - forward-looking risk disclosure - is dichotomous. It is assigned a value of one if the firm discloses forward-looking risk information in their annual report and zero otherwise.

Kravet and Muslu (2013) developed a UNIX perl code to identify forward-looking disclosures that indicate future risk or uncertainties. Specifically, the code records a sentence as forward-looking risk or risk-related if it contains at least one keyword that connotes risk. These keywords (where a (*) indicates that suffixes are allowed) are: "can, cannot, could, may, might, risk(*), uncertain(*), likely to , subject to, potential(*), vary(*), varies, depend(*), expos(*), fluctuat(*), possibl(*), susceptible, affect, influenc(*), and hedg(*)". This study will adopt this code to facilitate measuring the content of forward-looking risk information by counting the number of sentences with at least one of these keywords.

I firstly adopt the UNIX perl code to identify risk sentences within the annual reports of twenty randomly chosen companies; after reading them carefully I found

almost all tagged sentences to be risk-related, which reflects the effectiveness of the code words. In the "Principal Risks and Uncertainties" section, which has the most intensive risk information, nearly all the sentences feature at least one of the UNIX perl code key word. This list is not exhaustive; after careful examination of the narrative parts of the selected annual reports, more code words were added as an expansion of Kravet and Muslu's (2013) UNIX perl code to capture the meaning of future performance-related and strategic decisions of the firm, these words are: opportunit*, prospect, expect, impact, outlook.

The most frequently-appearing words - "can, could, may, might" - are polysemous, in that they can indicate a future prospective but also be understood as "be able to" and do not imply a specific time orientation. Thus, if I solely relied on the computer software to identify risk-related sentences there would be a risk of resulting in unreliable data because of the "boiler plate" word problem (Abraham and Cox, 2007). Therefore, in the second step of my analysis, I carried out a manual examination of all tagged risk-related sentences to filter out those sentences that contain the boiler word but merely discussed risk information. The combination of these two approaches is an experimental practice that will hopefully decrease the subjectivity of content analysis, meanwhile maintaining consistency in the coding process.

2.5. Model specification

$$FRD_{i,t+1} = \beta_0 + \beta_1 CG_{i,t} + \beta_2 OWNERSHIP_{i,t} + \beta_3 CONTROL_{i,t} + v_j + \varepsilon_{i,t} \quad (2.1)$$

where *FRD* represents the total volume of forward-looking risk disclosure. *CG* is a set of corporate governance variables that include: board composition, board independence, board size and audit committee effectiveness. Board composition is measured by non-executive board members score (*NES*) and the dominance of non-executive directors on the board (*DNE*). *NES* is the percentage of non-executive board members over the total number of board members. *DNE* is defined as when the non-executive directors constitute over 50% of total board members. Board independence is measured by independent board member score (*IBS*), and dominance of independent directors on the board (*DIB*). *IBS* is the percentage of independent board members as reported by the company (independent board members are those individuals not employed by the company, not employed by or representing a major shareholder, not having served on the board for more than ten years, not a reference shareholder with more than 5% of holdings, not holding any cross-board membership, having no recent or immediate family ties to the company, and not in acceptance of any compensation other than compensation for board service). *DIB* is defined as when the independent directors constitute over 50% of total board members. Board size (*BS*) is measured by the logarithm of the total number of board members. Audit committee effectiveness (*ACE*) is a dichotomous composite measure comprising four characteristics: audit committee independence, expertise, diligence and size, and is coded as 1 if a company fulfils all the four characteristics of an effective audit committee and is coded as 0 otherwise[3].

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[3] I follow the same definition as per Zaman et al. (2011): first, all members of the audit committee must be independent non-executive directors; second, at least one member of the audit committee has recent and relevant financial expertise and desirably have a professional qualification from one of the professional accountancy bodies; third, audit committees should meet no fewer than three times during a year, held to coincide with key dates within the financial reporting and audit cycle; fourth, the audit committee should comprise at least three members to ensure it functions effectively.

The *OWNERSHIP* variables are calculated as the total number of shares held by each type of investor relative to the total number of shares outstanding per firm. Employee-held shares (*EMHS*) are the percentage of strategic share holdings of 5% or more held by employees, or by individual investors. Investment-institution-held shares (*INVEHS*) are the percentage of total shares in issue held as long term strategic holdings by investment banks or institutions seeking a long term return. The *CONTROL* variables indicate the factors found in previous studies that might impact a firm's voluntary risk disclosures: firm size (*SIZE*), measured by the natural logarithm of total number of employees; a firm's financial performance, which uses *ROA* as an indicator; leverage (*LEV*), calculated by total debt/total capital; and liquidity (*LIQU*), estimated using the current ratio of current assets to current liabilities. Finally, v_j is an industry-specific component, which I control for by including industry dummies (*IND*)[4].

2.6. Data and summary statistics

2.6.1. Data construction

The original sample consists of 240 non-financial institutions listed within the FTSE 350 Index in 2010, based on the 2010 FTSE 350 companies list, published by Thomson Reuters. Three companies had not yet released complete full- year annual reports; therefore 237 firms were coded. All annual reports are collected from the company websites with a year-end date nearest to 31st December 2010. Due to the unavailability of corporate governance information in annual reports and missing

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[4] The Industry Classification Benchmark (ICB) segregate markets into 9 non-financial sectors: basic materials, consumer goods, consumer services, health care, industrials, oil and gas, technology, telecommunications, utilities.

ownership and financial ratios from DataStream, the original sample shrinks to 206 observations (see Table 2.1 for sample industry coverage).

Table 2.1

Sample industry coverage and variable mean values

Industries	$Total_0$	$Total_1$	No. of observations
Oil & Gas	147	164	15
Basic Materials	162	178	19
Industrials	121	138	56
Consumer Goods	112	126	24
Health Care	180	200	8
Consumer Services	94	111	55
Telecommunications	113	121	5
Utilities	147	165	8
Technology	99	112	16

Notes: $Total_0$ is the total volume of risk disclosure exclude internal control risk management policies, $Total_1$ is total volume of risk disclosure include internal control risk management policies.

The risk disclosure measures in this study are limited to the information published in annual reports. Financial institutions are excluded from the sample since the nature of these firms varies considerably from non-financial firms and this difference can have a significant effect on the risk disclosure approaches of the two groups (Linsley and Shrives, 2006). The FTSE 350 Index was chosen as it comprises the largest firms in the UK, based on corporate market capitalisation. Most existing research (Abraham and Cox, 2007; Linsley and Shrives, 2006) uses the FTSE 100 Index; this study, for the first time, explores forward-looking risk disclosure within a comparatively large sample. I limit the analysis to one year considering that firms'

disclosure practices appear to remain reasonably constant over time. This is the normal empirical approach in analysing risk disclosure level and content (e.g.,, Botosan, 1997; Linsley and Shrives, 2005, 2006; Abraham and Cox, 2007). Admittedly, the year-to-year disclosure observations for a single firm are not independent; I choose to obtain greater cross-sectional observations as opposed to observations over time. The year 2010 is chosen as 2010 is generally viewed as a threshold when the monetary market started to recover following a period of severe market recession and volatility since the 2007 financial crisis; thus listed firms are expected to place greater value on risk disclosure to win back investors' confidence. Another reason is that this year provides very recent empirical evidence in post era of the 2007 financial crisis and facilitates gaining reasonable access to firms' annual reports yet still guarantees post-sample year data is obtainable.

In Model (2.1), data pertaining to board and ownership structure are obtained from DataStream. Audit committee composite data is sourced from the annual reports of sample companies in 2009 (closest to the 31st Dec. 2009)[5].

2.6.2. Summary statistics

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[5] Codes in DataStream I use for searching include: Non-Executive Board Members score: CGBSO06S - percentage of non-executive board members; Independent Board Members Score: CGBSO07S - percentage of independent board members as reported by the company; Board Size: CGBSDP060 - the total number of board members at the end of the fiscal year; Audit Committee Independence: CGBFDP018 the percentage of independent board members on the audit committee as stipulated by the company; Audit Committee Non-Executive Member : CGBFDP019 the percentage of non-executive board members on the audit committee as stipulated by the company; Board Functions/Audit Committee Expertise: CGBFO03S – does the company have an audit committee with at least three members and at least one "financial expert" within the meaning of Sarbanes-Oxley; Investment institutions held shares: NOSHIC - the percentage of total shares in issue held as long term strategic holdings by investment banks or institutions seeking a long term return; employees held shares: NOSHEM - the percentage of total shares in issue held by employees or by those with a substantial position in a firm that provides significant voting power at an annual general meeting.

The descriptive statistics are presented in Table 2.2; the average number of disclosure sentences across the sample is 120 ($Total_0$), with a maximum of 455 and a minimum of 26, indicating a large variation in firms' forward-looking risk disclosures. This is also reflected in a large standard deviation of 65.39. $Total_1$ that includes internal control risk management policies reflects similar characteristics of $Total_0$. Regarding board attributes, non-executive and independent directors comprise averagely less than 40% of the board. This is a different composition compared with Abraham and Cox (2007) and Donnelly and Mulcahy's (2008) studies, which both document a presence above 50% of non-executive and independent board directors. This might partly be due to sample differences - Abraham and Cox (2007) consider FTSE 100 firms and Donnelly and Mulcahy (2008) study Ireland firms. A more detailed inspection of the raw data used to produce Table 2.2 reveals that only slightly less than 25% of sample companies have dominant non-executive and independent directors on the board. The average board size (measured by the logarithm of total board members) is 2.17. The composite measure of audit effectiveness reveals that a significant majority of sample firms (88%) have complied with the FRC (2012) guidance on improving the effectiveness of corporate audit committees. Across the whole sample set, 181 out of 206 companies fulfil all four requirements of a high quality audit committee including independence, diligence, expertise and size[6]. In view of ownership structure, corporate shareholdings by inner employees is on average 6.08% per sample firm; that of outside investment institutions 10.41%.

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[6] Results are not reported in Table 2.2, but are available on request.

Table 2.2

Descriptive statistics

	Mean(Median)	S.D.	Min(Max)	Skewness	Kurtosis
Forward-looking risk disclosure					
$Total_0$	120 (112)	65.39	26 (455)	1.90	8.49
$Total_1$	136 (125)	70.26	28 (480)	1.80	7.93
CG characteristics					
Non-executive score	37.05 (38.9)	16.26	2.01 (85.22)	0.23	2.64
Dominance of non-executives	0.21 (0)	0.41	0 (1)	1.40	2.95
Independent executive score	38.57 (37.5)	17.02	1.95 (88.51)	0.30	2.50
Dominance of independent-executive	0.24 (0)	0.43	0 (1)	1.20	2.44
Board size	2.17 (2.20)	0.25	1.61 (2.83)	0.22	2.84
Audit committee effectiveness	0.88 (1)	0.33	0 (1)	-2.32	6.38
Ownership structure					
Employee held shares	6.08 (0)	15.05	0 (77)	2.96	11.46
Investment institutions held shares	10.41 (8)	9.94	0 (52)	1.30	5.15
Control variables					
Size	9.01 (9.12)	1.68	2.64 (13.24)	-0.46	3.60
ROA	6.59 (5.88)	6.39	-6.27(22.14)	0.46	3.47
Leverage	23.52 (22.56)	17.38	0 (60.44)	0.38	2.26
Liquidity	1.48 (1.29)	0.88	0.43 (3.89)	1.35	4.32
Observations	206	206	206	206	206

Notes: dominance of non-executives is a dummy variable where it equals 1 if the board is constituted by 50% or more non-executive directors, otherwise 0. Dominance of independent-executive is a dummy variable, where it equals 1 if the board is constituted by 50% or more independent directors, otherwise 0. Audit committee effectiveness is a dummy variable where it equals 1 if the audit committee fulfils all four requirements of a high quality audit committee, otherwise 0.

Table 2.3 reports correlations between the total volume of forward-looking risk disclosure, CG characteristics and ownership structure. Overall, the results suggest a positive association between FRD and CG attributes and a negative association between FRD and the percentage of investment institutions and employees held shares. Noticeably, the relationship between non-executive score and independent executive score displays a high correlation of 0.593, which is likely because non-executive directors overlap with independent directors.

Table 2.3

Correlation matrix between CG characteristics and ownership structure and FRD

	$Total_0$	NES	IBS	BS	ACE	INVEHS	EMHS	SIZE	LEV	LIQU	ROA
$Total_0$	1.000										
NES	0.272	1.000									
IBS	0.332	0.593	1.000								
BS	0.351	0.080	0.144	1.000							
ACE	0.192	0.120	0.230	0.180	1.000						
INVEHS	-0.210	-0.102	-0.078	-0.261	0.006	1.000					
EMHS	-0.158	-0.013	-0.206	-0.112	-0.151	-0.235	1.000				
SIZE	0.290	0.162	0.223	0.336	0.168	-0.196	-0.128	1.000			
LEV	0.086	0.021	0.053	0.121	0.028	-0.110	-0.065	0.182	1.000		
LIQU	-0.046	-0.045	-0.029	-0.111	-0.019	-0.012	0.190	-0.359	-0.315	1.000	
ROA	-0.012	0.110	-0.029	-0.050	-0.139	-0.078	-0.008	-0.087	-0.141	-0.018	1.000

Note: $Total_0$ – total volume of forward-looking risk disclosure exclude internal control risk management policies; NES – non-executive score; IBS – independent board score; BS – board size; ACE – composite measure of audit committee effectiveness; INVEHS – investment institutions held shares; EMHS – employees held shares. Correlation results for $Total_1$ indicate similar results therefore I do not present the results here.

2.7. Regression results

2.7.1. The determinants of forward-looking risk disclosure

Tables 2.4 and 2.5 display the OLS regression (with White heteroscedasticity consistent standard errors) results for the variables used in Model (1). Some board attributes (e.g. non-executive score, independent board score and board size) are inter-correlated, and the concerns about the collinearity between firm size and board size also remain; if I put the CG and ownership indicators in the same model and test how these board attributes and ownership structure affect risk disclosures simultaneously, the module might suffer from multicollinearity, therefore I run a number of OLS tests separately including these variables one at a time to avoid the statistic problem. I note that in Table 2.4, the level of forward-looking risk disclosures is significant positively correlated with all CG characteristics. Specifically, the strong positive correlations between FRD and the percentage of the board comprised of non-executive and independent directors are revealed by the coefficient of 0.675 and 0.760 respectively and both significant at 1% level, indicating that higher presence of non-executive and independent directors on board is important in the communication of risk information to investors. Both the findings evidence scholarly work on the principal-agent problem generally connected with the association of executive dependent directors with greater agency problems and less disclosure. In order to further test the monitoring effect of board characteristics on risk disclosure, I include two dichotomous variables regarding dominance of non-executives, or of independent executives, which indicates whether a board is comprised of over 50% of non-executive directors or independent directors. I observe significant and positive coefficients (19.944/41.046) of the two variables,

which confirm that companies with dominant non-executive and independent directors on the board are more likely to disclose more forward-looking risk information in their annual reports. This evidence support Hypothesis 1 and 2. Board size is significant positively correlated with FRD, with a coefficient of 57.305, significant at 5% level. Concern about the collinearity between board size and firm size remains however; this is due to larger boards generally indicating a larger firm size, where larger firms engage in more voluntary disclosure than their smaller counterparts. Therefore I exclude firm size variable (*SIZE*) and retest the correlation between board size and *FRD*. The result is consistent with a coefficient of 80.49[7], significant at 1% level, indicating that the collinearity effect between board size and firm size is minimal and main regression is effective. This supports Hypothesis 3. The composite measure of audit committee effectiveness also shows a positive and significant association (with a coefficient of 18.168, at 10% significance level) with the total amount of forward-looking risk disclosures, which support Hypothesis 4, that a more effective audit committee has a higher monitoring effect that leads to more voluntary risk disclosure.

Regarding the control variables, I report a significant positive relationship between firm size and the volume of FRD in all univariate tests (at 1% significance level). This is in line with previous literature that larger firms are inclined to disclose more information as it is less costly and with lower cost of capital and higher scrutiny from regulatory authorities. I also find a positive relationship between firm profitability and leverage and the extent of FRD, and a negative relationship between liquidity and the extent of FRD, but the effects are not significant.

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[7] The results are not reported but available on request.

Table 2.4

OLS regression of the relationship between FRD (Total$_0$) and CG characteristics

FRD	Predicted sign	CG characteristics					
		(1a)	(1b)	(2a)	(2b)	(3)	(4)
NES	+	0.675*** (0.003)					
DNE	+		19.944* (0.055)				
IBS	+			0.760*** (0.002)			
DIB	+				41.046*** (0.000)		
BS	+					57.305** (0.014)	
ACE	+						18.168** (0.062)
SIZE	+	12.965*** (0.001)	13.239*** (0.001)	12.109*** (0.002)	11.825*** (0.001)	10.960*** (0.004)	13.419*** (0.001)
ROA	?	0.042 (0.947)	0.070 (0.912)	0.251 (0.680)	0.108 (0.857)	0.178 (0.765)	0.345 (0.586)
LEV	+	0.341 (0.103)	0.381 (0.069)	0.330 (0.108)	0.275 (0.167)	0.324 (0.128)	0.382* (0.072)
LIQU	-	-3.045 (0.589)	-3.493 (0.547)	-4.099 (0.444)	-3.482 (0.508)	-3.823 (0.474)	-4.027 (0.482)
Constant		-49.442 (0.231)	-30.334 (0.478)	-46.919 (0.244)	-22.338 (0.575)	-133.51** (0.023)	-43.190 (0.318)
F value		4.45	4.31	4.98	5.20	4.83	5.02
Adj. R^2		0.26	0.25	0.27	0.31	0.28	0.25
Observations		206	206	206	206	206	206

Note: Total$_0$ – total volume of forward-looking risk disclosure exclude internal control risk management policies; NES – non-executive score; DNE – dominance of non-executive directors; IBS – independent board score; DIB – dominance of independent board members; ACE – audit committee effectiveness (composite measure).

Table 2.5 reports the effect of ownership structure on firms' forward-looking risk disclosure practices. The coefficients on the ownership variables provide substantial support for the hypothesized relationships between the classes of different investors and risk reporting. Corporate ownership by inside employees is negatively related to forward-looking risk disclosure with the coefficient of -0.609, supporting previous arguments that inside investment employees prefer companies not to disclose too much risk information due to concerns regarding proprietary costs. However, I find a negative relationship between investment-institutions-held shares and the level of FRD, but this relationship is not statistically significant. From a stakeholder agency perspective, whilst large, long-term institutional shareholders may accomplish a monitoring function, this does not seem to include compelling firms to increase voluntary risk disclosure. Rather, a preference for firms with a lower level of forward-looking risk disclosure, as revealed in my analyses, suggests motives for private information acquisition.

Turning to the control variables, the coefficient for firm size is statistically significant and positive in both Table 2.4 and Table 2.5, confirming previous work that suggests larger firms tend to publish greater risk disclosure. ROA, leverage and liquidity are not statistically significant. Regression results for the industry controls are not presented in the table due to space limitations, but I find Consumer Goods, Consumer Services, Technology and Telecommunications to be relatively low risk disclosing sectors. The statistic coefficient can also be evidenced by the *Sample industry coverage and variable mean values* as presented in Table 2.1, where I find that industries which disclosure less forward-looking risk information in the previous year have a higher beta in the following year. This relates to my discussion of the impact of forward-looking risk disclosures on firm risk as per Chapter 3 (pp.132).

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Table 2.5

OLS regression of the relationship between FRD (Total$_0$) and ownership structure

FRD	Predicted sign	Ownership structure	
		(1)	(2)
EMHS	-	-0.609***	
		(0.010)	
INVEHS	-		-0.480
			(0.246)
SIZE	+	13.365***	13.338***
		(0.001)	(0.001)
ROA	?	0.257	0.143
		(0.685)	(0.825)
LEV	+	0.366	0.334
		(0.084)	(0.127)
LIQU	-	-2.627	-4.460
		(0.643)	(0.431)
Constant		-24.792	-14.46
		(0.559)	(0.758)
F value		4.49	4.67
Adj. R^2		0.25	0.24
Observations		206	206

Note: Total$_0$ – total volume of forward-looking risk disclosure exclude internal control risk management policies; INVEHS – investment-institution-held shares; EMHS – employee-held shares.

2.7.2. Additional tests

The usefulness of general statements regarding risk management policies in Corporate Governance sections has often been questioned in previous literature (e.g.,, Linsley and Shrives, 2006), as institutional investors request more specific and detailed risk discussions. Despite a lack of specification, a clarified explanation of internal control risk management systems as an important mechanism for corporate governance does contain useful information about how risk committees work and how risk management is organised within the firm. Therefore, I include internal control risk management policies into the total volume of forward-looking risk disclosures (Total[1]) and re-examine the relationship between corporate governance characteristics and ownership structure and Total[1]. The results are presented in Table 2.6 and 2.7. Regressions results exhibit similar patterns with those reported in Table 2.4 and 2.5, which provide further evidence for the hypotheses in this chapter.

Although our risk disclosure metrics (FRD) are insignificantly different from a normal distribution, some of our observations have a lower bound of zero, for instance: the minimum disclosure of forward-looking financial risk is 0, the minimum disclosure of good news is 0, and the minimum disclosure of forward-looking quantitative risk is 0[8]. In order to assess whether this characteristic could potentially influence the obtained results I estimate the main regression above using both traditional OLS (with robust standard errors) and Tobit estimators, the latter of which is designed form cases where a dependent variable has a lower or upper bound (censored). The results are presented in Table 2.8 and Table 2.9. Both the traditional OLS (with robust standard errors) and Tobit estimators generate almost identical results.

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[8] See descriptive statistics of Table 3.6 on Page 128 and Table 4.2 on Page 183.

Table 2.6

OLS regression of the relationship between FRD (Total₁) and CG characteristics

FRD	Predicted sign	CG characteristics					
		(1a)	(1b)	(2a)	(2b)	(3)	(4)
NES	+	0.707*** (0.004)					
DNE	+		20.490* (0.061)				
IBS	+			0.85*** (0.001)			
DIB	+				43.378*** (0.000)		
BS	+					63.257** (0.019)	
ACE	+						18.578* (0.076)
SIZE	+	13.494*** (0.002)	13.798*** (0.002)	12.59*** (0.003)	12.278 (0.003)	11.217*** (0.011)	13.986*** (0.002)
ROA	?	-0.032 (0.964)	-0.001 (0.999)	-0.003 (0.997)	0.036 (0.957)	0.107 (0.870)	0.284 (0.684)
LEV	+	0.366 (0.110)	0.408* (0.075)	0.31 (0.162)	0.296 (0.175)	0.345 (0.137)	0.409* (0.079)
LIQU	-	-4.064 (0.515)	-4.543 (0.480)	-5.07 (0.390)	-4.517 (0.440)	-4.870 (0.405)	-5.091 (0.423)
Constant		-47.246 (0.309)	-27.24 (0.574)	46.64 (0.325)	-18.782 (0.682)	-141.11** (0.028)	-40.391 (0.410)
F value		4.27	4.11	4.89	5.06	4.61	4.88
Adj. R^2		0.25	0.23	0.26	0.29	0.26	0.23
Observations		206	206	206	206	206	206

Note: Total₁ – total volume of forward-looking risk disclosure include internal control risk management policies; NES – non-executive score; DNE – dominance of non-executive directors; IBS – independent board score; DIB – dominance of independent board members; ACE – audit committee effectiveness (composite measure).

Table 2.7

OLS regression of the relationship between FRD (Total₁) and ownership structure

FRD	Predicted sign	Ownership structure	
		(1)	(2)
EMHS	-	-0.607**	
		(0.015)	
INVEHS	-		-0.583
			(0.213)
SIZE	+	13.950***	13.760***
		(0.002)	(0.003)
ROA	?	0.192	0.057
		(0.782)	(0.936)
LEV	+	0.393	0.352
		(0.090)	(0.145)
LIQU	-	-3.696	-5.626
		(0.557)	(0.371)
Constant		-21.736	-7.912
		(0.655)	(0.884)
F value		4.22	4.48
Adj. R^2		0.24	0.23
Observations		206	206

Note: Total₁ – total volume of forward-looking risk disclosure include internal control risk management policies; INVEHS – investment-institution-held shares; EMHS – employee-held shares.

Table 2.8

Tobit retest of the relationship between FRD (Total$_0$) and CG characteristics and ownership structure

FRD	Predicted sign	CG characteristics						Ownership structure	
		(1a)	(1b)	(2a)	(2b)	(3)	(4)	(5)	(6)
NES	+	0.675*** (0.008)							
DNE			19.944 (0.056)						
IBS	+			0.760*** (0.001)					
DIB					41.046*** (0.000)				
BS	+					57.305** (0.001)			
ACE	+						18.168 (0.137)		
EMHS	-							-0.609** (0.029)	
INVEHS	-								-0.480 (0.260)
SIZE	+	12.965*** (0.000)	13.239*** (0.000)	12.109*** (0.000)	11.825*** (0.000)	10.960*** (0.000)	13.419*** (0.000)	13.365*** (0.000)	13.338*** (0.000)

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ROA	?	0.042	0.070	0.251	0.108	0.178	0.345	0.257	0.143
		(0.946)	(0.911)	(0.681)	(0.857)	(0.770)	(0.581)	(0.678)	(0.820)
Leverage	+	0.341	0.381	0.330	0.275	0.324	0.382	0.366	0.334
		(0.177)	(0.134)	(0.188)	(0.263)	(0.196)	(0.135)	(0.149)	(0.196)
Liquidity	-	-3.045	-3.493	-4.099	-3.482	-3.823	-4.027	-2.627	-4.460
		(0.559)	(0.506)	(0.427)	(0.490)	(0.458)	(0.444)	(0.618)	(0.399)
Constant		-24.110	-6.839	-17.202	3.957	-98.071**	-16.436	-0.648	7.668
		(0.421)	(0.816)	(0.555)	(0.889)	(0.015)	(0.587)	(0.982)	(0.812)
Chi^2		76.35	72.92	79.49	89.18	80.11	71.49	74.07	70.55
Pseudo R^2		0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03
Observations		206	206	206	206	206	206	206	206

Note: Total_0 – total volume of forward-looking risk disclosure exclude internal control risk management policies; NES – non-executive score; IBS – independent board score; ACE – audit committee effectiveness (composite measure); INVEHS – investment-institution-held shares; EMHS – employee-held shares.

Table 2.9

Tobit retest of the relationship between FRD (Total$_1$) and CG characteristics and ownership structure

FRD	Predicted sign	CG characteristics						Ownership structure	
		(1a)	(1b)	(2)	(2b)	(3)	(4)	(5)	(6)
NES	+	0.707** (0.011)							
DNE			20.490* (0.071)						
IBS	+			0.828*** (0.001)					
DIB					43.378*** (0.000)				
BS	+					63.257*** (0.001)			
ACE	+						18.578 (0.162)		
EMHS	-							-0.607** (0.045)	
INVEHS	-								-0.583 (0.208)
SIZE	+	13.494*** (0.000)	13.798*** (0.000)	12.513*** (0.001)	12.278*** (0.000)	11.217*** (0.000)	13.986*** (0.000)	13.950*** (0.000)	13.760*** (0.000)

ROA	?	-0.032	0.001	0.187	0.036	0.107	0.284	0.192	0.057
		(0.963)	(0.999)	(0.778)	(0.956)	(0.871)	(0.677)	(0.775)	(0.933)
LEV	+	0.366	0.408	0.352	0.296	0.345	0.409	0.393	0.352
		(0.183)	(0.140)	(0.196)	(0.269)	(0.204)	(0.141)	(0.155)	(0.209)
LIQU	-	-4.064	-4.543	-5.172	-4.517	-4.870	-5.091	-3.696	-5.626
		(0.473)	(0.426)	(0.356)	(0.411)	(0.384)	(0.374)	(0.519)	(0.328)
Constant		-13.829	4.258	-7.039	15.667	-96.448	-5.556	10.422	21.862
		(0.671)	(0.894)	(0.824)	(0.613)	(0.027)	(0.866)	(0.746)	(0.533)
Chi^2		71.23	67.93	74.96	83.45	75.86	66.63	68.69	66.26
Pseudo R^2		0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03
Observations		206	206	206	206	206	206	206	206

Note: Total$_1$ – total volume of forward-looking risk disclosure include internal control risk management policies; NES – non-executive score; IBS – independent board score; ACE – audit committee effectiveness (composite measure); INVEHS – investment-institution-held shares; EMHS – employee-held shares.

2.8. Conclusion

This study examines the determinants of forward-looking risk disclosure within UK annual reports. I find that corporate boards with a higher presence of independent, non-executive directors, larger board sizes and higher audit committee effectiveness all contribute to more forward-looking risk disclosures. Conversely, share holdings by investment institutions and inside employees are negatively related to forward-looking risk disclosure.

The originality of this cross-sectional exploration of forward-looking risk disclosures and the association with CG characteristics and ownership has opened up new avenues for future risk disclosure studies. Sample companies could be selected from other countries and comparative cross-country studies would be of particular relevance. When conducting investigations in other countries, attention needs to be paid to legislation requirements, accounting standards and cultural attitudes which might have an influence on firms' risk reporting practices (Aljifri and Hussainey, 2007). Research that investigates forward-looking risk information in specific industries might also yield considerable results. Admittedly, the nature of financial firms is significant different from that of non-financial firms, but another separate study could be conducted to examine whether the results of this study hold for financial institutions too. Future research could also incorporate risk information from a variety of sources, rather than exclusively rely on annual reports.

Chapter 3

The impact of forward-looking risk disclosures on firm risk: Evidence from the UK

3.1. Introduction

An increasingly unpredictable and unstable financial environment, especially in the wake of recent financial crises, has brought risk disclosure issues under the close scrutiny of investors and regulators. There is a long-standing criticism of risk disclosure, particularly in respect of lack of transparency and the limited availability of information (Solomon et al., 2000; Kajuter, 2001). This criticism has become fiercer recently, as stock markets have shown unparalleled high volatility and many firms have undergone devastating downturns.

Corporate risk disclosures first came to widespread attention when AAA/FASB[9] 1997 conference debates revealed that the US firms' annual reports were publishing inadequate risk information. ICAEW[10] also stressed the risk of a

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[9] AAA is short for American Accounting Association; FASB is short for Financial Accounting Standards Board.
[10] ICAEW is short for the Institute of Chartered Accountants in England and Wales.

deficiency in information, and released three discussion documents (in 1998, 1999 and 2002) urging UK firms to disclose risk information in greater depth. The Best Practice in Corporate Governance produced by the Turnbull Committee wielded further influence over internal control and risk management disclosures. Despite early professional organisations' efforts, empirical evidence as scrutinised by the academic community regarding to disclosures is limited. By exploring a survey of UK institutional investors, Solomon et al. (2000) state that managers should disclose more verifiable risk information instead of generalized statements on risk management policies. Following Solomon and colleagues' call for risk disclosure studies, Linsley and Shrives (2000) outline the advantages and disadvantages of voluntary risk disclosures through investigating a sample of 79 UK firms. Linsley and Shrives (2005) discuss similar issues based on the study of 18 British and Canadian banks. They draw attention to the potential merit of increasing voluntary risk disclosures on reducing firms' cost of capital and also suggest that forward-looking risk information is extremely valuable to investors. However, they fail to further explain the potential benefits of increasing forward-looking risk disclosures. Dietrich et al.'s (2001) experiments, although focus on all unconcealed risk disclosures, indicate the utility of disclosing forward-looking risk information from the perspective of market efficiency. Linsley and Shrives (2005) explain that managers are typically reluctant to disclose forward-looking risk information due to proprietary costs and legitimacy issues. Using a sample of 27 firms, Beattie et al. (2004) examine risk information throughout the entire annual report narrative disclosures, and find a mere 2.4% of total text Hal references to forward-looking risk/opportunity information, of which only 7% were quantified. Beretta and Bozzolan (2004) complement this finding as to the discussion of future risk:

managers are often reluctant to specify its impact. Despite the provision of improving forward-looking risk disclosures, there is no empirical approach in the existing literature that relates to a comprehensive forward-looking risk disclosure examination - and there has been no research academically tests the potential benefits of increasing the amount of voluntary forward-looking risk disclosures on firms' risk reduction. The present study will address this gap by extensively exploring forward-looking risk disclosures within the annual reports of 216 UK non-financial companies listed in FTSE 350 index. The objective is to explore whether increasing the volume of voluntary forward-looking risk disclosures leads to lower firm risk. In doing so, it will provide contemporary evidence on the reliability and usefulness of forward-looking risk disclosures.

The hypothesis in this study draws theoretical support from stakeholder-agency theory (Hill and Jones, 1992), resource-based review (RBV), and quality signalling theory (Toms, 2002). By admitting market inefficiencies, stakeholder-agency theory allows for resultant power differentials between stakeholders and managers. Therefore, managers have the advantage to exploit stakeholders' benefits through manipulating risk disclosures. In this case, stakeholders response to ask for more risk disclosure than managers are initially provided within annual reports so as to monitor risk management, and better estimate the risk exposure of the firm, ultimately making more informed investments. The disclosure of more forward-looking risks can reduce asymmetric information risk and help improve a firm's accessibility to capital markets by reducing investors' expenses on collecting information. In addition, the market can better understand the company's risk position and may perceive the company as less risky. As to the contents of forward-looking risk disclosures, the resource-based view (RBV) (Barney, 1991) and quality

signalling theory (Toms, 2002) suggest that, where a firm effectively applies valuable, rare, inimitable and/or non-replicable (VRIN) resources to implement threat mitigation and opportunity-creation strategies which are difficult to imitate and substitute, a firm's risk controlling system can be improved; thus its competitive advantages are strengthened and its systematic risk will be deemed lower. This provides theoretical support for our hypothesis that where firms disclose more specific operational, quantitative and the kind of good news regarding forward-looking risk information that competitors find hard to imitate, the value of strategic risk management will be transmitted to investors, and this will positively influence investors' risk perception of the firm.

This research contributes to risk disclosures studies in several aspects. First, to the best of my knowledge it may represent the first attempt in the literature that an exclusive and extensive forward-looking risk disclosure analysis has been conducted within the annual reports of a comparatively large and cross-sectional sample. This research reports a significant and negative relationship between the total number of forward-looking risk disclosures and firms' systematic risk. This adds to the existing empirical argument relating to the benefits of improving the transparency of firm risk disclosures. Second, I adopt a resource-based view (RBV) and signalling theory to explain the content of forward-looking risk disclosures, and find that the more operational 'good news', and quantitative risks that are forward-disclosed, the stronger the effect on lowering firm risk. The result suggests that an effective way to improve the quality of forward-looking risk disclosure is increasing voluntarily published, operational, 'good news' and quantitative risk information. Thirdly, the methodology I apply is experimental: I build a complete set of key code words based on the UNIX perl code (Kravet and Muslu, 2013) then use it to assist with content

analysis. This approach decreases the subjectivity of content analysis and takes advantage of computer software's mechanical nature. The bond of manual and computer-assisted content analysis provides a testable means for future risk disclosure studies. Investors, creditors and auditors will hopefully find the results reported in this thesis useful as they provide a measurement that can be used to assess firms' risk exposure. Accordingly, these readers can expand their exploration and verify the risks in reporting policies to target companies, and supervise and urge companies to improve the overall quality of their forward-looking risk disclosures; in this way, readers of annual reports can also be better served. Moreover, this research will hopefully interest regulators and policy makers who advocate the provision of higher quality, transparent and timely risk disclosures.

The remainder of this chapter is structured as follows: Section 3.2 discusses stake-holder agency theory and the resource-based view (RBV) as well as the signalling theory that the present research is based on. Section 3.3 locates the research within the context of existing forward-looking disclosure and risk disclosure literature and defines categorisations of forward-looking risks. Methodology and risk measure are discussed in Section 3.4 and data collection is described in section 3.5. Hypotheses developments are presented in Section 3.6, and Section 3.7 presents the results. In the final section, conclusions are drawn and suggestions are made for future studies.

3.2. Theoretical development

3.2.1. Stakeholder-agency theory

Stakeholder-agency theory is originally detailed by Hill and Jones (1992) who view the firm as a 'nexus' of implicit and explicit contracts, among all stakeholders. In broad sense, a company's stakeholders encompass all resource holders, not only including managers and extensive stockholders, but also creditors, suppliers, customers, employees, general public and local communities. Each entity can be viewed as a contributor to a company's essential resources; in return they expect to receive the maximum return on their investment from the company.

Stakeholder-agency theory can apply on many concepts, for example, the principal-agent relationship, as the latter can be viewed as a subset of stakeholder-agent relationships in a more general definition. Agency theory is based on assumptions of market efficiency and a power balance between managers and stakeholders. The efficient markets assumption holds that stakeholders and managers are free to enter into and exit from contractual relationships such as a better alternative contract may be available. Comparatively, stakeholder-agency theory allows for the existence of market inefficiencies, which fosters the resultant power differentials between managers and stakeholders. Stakeholder-agency theory assumes that if a firm operates in a market that is not perfectly efficient, then the existence of difference between stakeholders and managers must be acknowledged. Where managers are unable to resign from a contractual relationship without bearing considerable loss, or if the supply of managers exceeds the demand from stakeholders, power shifts towards the stakeholders. Similarly, if stakeholders are unable to dismiss managers, or if there is a scarcity of competent managers, power shifts towards the managers. Understanding the fundamentals of stakeholder-agency theory is critical as the power differential can substantially influence the structure of governance mechanisms monitoring those contracts.

Managers are playing a unique role since they play a key role in the nexus, and they are the "only group of stakeholders who enter into a contractual relationship with other stakeholders, and are also the only group of stakeholders with direct control over the decision-making apparatus of the firm" (Hill and Jones, 1992, pp.134). Therefore managers are expected to assign resources and make judicious decisions in consistent with other stakeholders. However, as information asymmetry exists between managers and stakeholders, managers obtain inside critical risk information and thus have the potential opportunity to twist facts when they are released to other stakeholders. This then increases stakeholders' difficulty in identifying whether managers are acting in their (the stakeholders') maximum interests. This disclosure gap, or information asymmetry, happens when managers selectively withhold some information from other stakeholders for various reasons. These include threats to their own positions, commercial sensitivities and uncertainty over risk measurements. Meanwhile, stakeholders may individually be prohibited from supervising a firm's risk-controlling system, as the cost of gathering and analysing additional information is untenable. Thus is highly probable where the stakeholder-agent nexus comprises abundant individuals or entities and no one controls a sufficient proportion of a firm's total resources. Such a situation grants managers stronger discretionary control as to the use of firm resources, resulting in the increase of residual loss for stakeholders. This (agency) problem discussed here is caused by power differentials when power shifts towards managers who then enjoy benefits to exploit stakeholders' benefits through manipulating disclosures. The suggested response is for stakeholders to demand more risk information than they are provided within annual reports so as to monitor the contractual relationship, and/or better estimate the risk exposure of the firm and make informed investments

as a result (Solomon et al., 2000).

According to the broad definition of stakeholders, financial analysts act as intermediaries between investors and company managers and play an essential role in internal and external contractual nexuses. Financial analysts provide individual and institutional investors with all kinds of professional advice, such as, risk evaluation, earnings forecast, and rating recommendation. Firms' voluntary forward-looking risk disclosures are consistently a considerable determinant of an analyst following and the characteristics of their forecasts since much of the information resource that analysts use in their estimation is sourced directly from the firm (Lang and Lundholm, 1996). In an investor-relations context, if it is less expensive to acquire information from inside the firm than to obtain it from other sources, enhanced voluntary disclosures will increase the supply of analyst services. Practically, analysts' role in the capital market would highly influence the effect of voluntary disclosures on the demand side of analyst services. After achieving and valuing informative resources from the firm, analysts convey their evaluation to the market, therefore more firm-provided information means analysts have more valuable reports to sell. In light of this, increased disclosures are attributed to increased analysts' following, since they have higher aggregate demand on firms' disclosed information. As is, firms currently have an incentive to increase analyst following, and will not likely engage in discretionary disclosures that would diminish analyst following. In accordance with this prediction, the analyst community is consistently in favour of more voluntary forward-looking risk disclosures. In addition to impacting the number of analysts following a firm, voluntary forward-looking risk disclosures are likely to affect analysts' forecast characteristics. In more specific terms, firms that voluntarily release more verifiable

forward-looking risk information will typically increase analysts' earning forecasts with more accuracy and less volatility. This is because analysts hold both firm-provided and privately-obtained information, but an increase in disclosure and timeliness decreases the weight analysts put on other information sources in building up their forecasting models, which "smooth[s] the forecast revision process by expediting the resolution of uncertainty" (Lang and Lundholm, 1996, pp.490). Moreover, analyst forecast accuracy improves when the informativeness of a firm's forward-looking risk disclosures increase. To the extent that analysts may be considered as representing or influencing investors' beliefs, improved forecast accuracy help investors obtain more accurate and less dispersed assumptions about a firm's future performance. Therefore firms disclosing higher volume of forward-looking risk information may have a larger cluster of potential investors who continuously pour into the massive funds. In respect of financial constraints, those high disclosing firms are less risky fall into financing difficulties.

Forward-looking risk disclosures provide early-warning signals for other stakeholders. Despite information producing costs and potential losses when proprietary and strategic risk information is exploited by competitors and new entrants, other costs can be decreased and revenues can be increased. Specifically, more forward-looking risk disclosures help improve a firm's accessibility to capital markets so as to attract more prospective stakeholders by decreasing their spend on collecting information. This reduction in information-gathering costs in turn improves the liquidity of a company's shares, and a possible reduction in the cost of capital (Ekaterina et al, 2007). Theoretically, if a manager selectively publishes forward-looking risk information this may fail to satisfy the information requirements of other stakeholders, and investors may consider the company a risky

investment as such management behaviour might incur costly explicit claims (i.e. litigation risks). In addition, other stakeholders may anticipate that internal risk management is inefficient, which indicates a restricted ability on the part of managers to obtain capital at consistent rates (Salama et al., 2011). On the contrary, a company disclosing more forward-looking risk information is generally viewed as less risky, because the company's risk position is fully mirrored in the market. In light of this, it can be argued that the more forward-looking risk information a firm chooses to disclose, the lower the perceived risk level of the firm.

As to the contents of forward-looking risk disclosures, Dobler (2008) states that managers determine risk disclosures in two ways: firstly, risk supervision and controlling, which are the major information sources of risk reporting, with the quality of risk disclosure dependent on managers' decisions as to the endowment of risk information. Secondly, risk disclosure is perceived as a means to influence investors' understanding about firm risk. When there is a potential threat to the company's economic value that is tied to mangers' personal wealth, mangers can influence readers' investment decisions by withholding some information that may threaten their administrative authority and badly influence firm's future performance. In particular, managers may explain the company's risk exposure in a more ambiguous, complicated, unpredictable and probabilistic tone; in such cases, outside investors should be cautious about the situation of the firm as certain information might not be available to investors.

When the firm is operating healthily and profitably, managers will send reassuring messages to diminish investors' doubts over potential uncertainty if a previously-predicted threat does not happen. Additionally, when directors disclosing risk, they have a predisposition to self-justification, attributing negative outcomes to

external risk that are beyond their control or responsibility.

In practice, risk disclosure generally allows for discretion, which is considered as subjective and partly non-verifiable. Combes-Thuélin et al.(2006) demonstrates that, even under mandatory accounting rules, managers can still selectively influence the information disclosing quality. Stakeholder-agency theory provides the theoretical support in explaining managers' decisions as to the extent and style of forward-looking risk disclosures, and whether such disclosures show deficient, optimistic and/or qualitative characteristics.

3.2.1. Resource-based view (RBV) and quality signalling theory

While stakeholder agency theory provides theoretical support to increasing the quantity of forward-looking risk disclosures on firm's risk reduction, the resource-based view (Barney, 1991) and quality signalling theory (Toms, 2002) offer deeper insights to find out what characteristics of risk disclosures can enhance the competitive advantages of a company, viewed as lower risks by the present research.

Andrews (1971) and Hofer and Schendel (1978) suggest an corporate organizing framework such that firms should apply strategies that make the best of their own strengths through responding to market and operational opportunities meanwhile mitigating external uncertainties and inside vulnerability in order to achieve sustained competitive advantages. Barney (1991) advances this framework and propose the 'Resource-based view (RBV)'. He suggests four indicators of the resources characterised by sustained competitive advantage: 'value', 'rareness', 'inimitability', and 'non-substitutability' (VRIN), which refers to a value-creating strategy, not simultaneously being employed by any current or potential competitors,

and when other firms are unable to duplicate the merits of this strategy. In specific: the four attributes of VRIN resource refer to: (a) valuable, implying that it utilizes opportunities and/or neutralizes uncertainties within a firm's operating environment, (b) rare, in terms of a firm's current and future competition, (c) imperfectly imitable and (d) non-replicable, signifying an absence of strategically equivalent substitutes for this resource. In a broad sense, firm resources consist of "all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc." dominated by a firm that allows a firm to conceive of and implement value-creating strategies that promote its efficiency and effectiveness (Barney, 1991). Abundant firm resources can be categorized into three classes: physical capital resources (Williamson, 1975), human capital resources (Becker, 1964), and organizational capital resources (Tomer, 1987). According to this definition, firm risk managers' experience, judgment, intelligence and insights are firm's valuable human capital resources. When they positively and forcefully act on capturing favourable future opportunities and mitigating threats and uncertainties through the application of physical capital resources, leading to a superior risk management system within a company, this generates firm's VRIN resources (organizational capital resources) and need be transmitted to institutional investors in annual reports.

However, the value of strategic risk management cannot be realised unless signalled to stakeholders. Toms (2002) provides a theoretical extension of the resource-based view by adding quality signalling theory. Toms (2002) suggests that a firm's reputation is established upon valuable resources in difficult-to-imitate projects and that such an application will encourage using annual reports as quality-signalling devices. Where asymmetric information exists, signalling is a possible response to market failure (Watts and Zimmerman, 1983). Signalling and agency

theories are in line with each other and are useful for explaining voluntary disclosures (Morris, 1987). The logic behind signalling theory is that, due to adverse selection and moral hazard problems when managers undertake risky but undisclosed actions, or investors faultily perceive similar risks across investment targets, firms with competitively advantageous risk management endowment have compelling incentives to inform their capital market monitors when disclosures are cost effective. Theoretically, managers as agents of the stakeholders are subject to heterogeneous pressures, particularly when operating in a stagnant market post the recent financial crisis and they count on quality signalling to respond to those pressures. Firms on a larger scale, for example the FTSE 350 companies, are likely to face greater scrutiny from analysts and fund managers. Meanwhile, regulators might exert pressure on risk managerial strategies that can be transmitted via the stock market and affect a firm's share value. Moreover, risk disclosure itself is a strong predictor of inimitable and non-replicable organizational capital resource. Therefore, where firms conceive of and implement threats neutralizing and opportunities seizing strategies that are valuable, rare, inimitable and non-replicable (VRIN) (Barney, 1991), managers have a strong incentive to signal the value of their strategies in annual reports, which will consequentially influence investors' risk perception of the firm.

Risk disclosures potentially offer an important channel for the transmission of risk management efficiency. Conversely, an effective risk controlling system promotes the quantity of risk disclosures, including forward-looking risk disclosures. The commonly used means for signalling purpose is the annual report, as it is a formally published document that discusses about the organisation as a whole (Gray et al., 2001). The signalling hypothesis holds that under certain circumstances, accurate signals will be acknowledged and false ones discarded. Thus the signal

must be difficult to imitate by competitors. Under the RBV and quality signalling theory framework, it is the credibility of the signal that is important. Previous disclosure quality studies give a high rating to quantitative and verifiable disclosures and specification of policies rather than a general statement of policy (Toms, 2002). Institutional investors value quantified information and firm-specific issues that inform readers of the risks in monetary terms. Corresponding to risk categorisations in this research, disclosing more operational, quantitative risks may increase disclosure quality. Good risk news, especially operational good risk news, by definition indicates the valuable, rare, inimitable, non-replicable (VRIN) opportunities of the company; thus, the more good risk news disclosed, the more future VRIN resources signalled. A competitor who does not implement effective threat mitigation and opportunity creation strategies will find it harder to imitate a genuine competitor if that firm uses disclosure channels to specify their competitiveness in risk controlling. Because the disclosure of forward-looking risks and mitigation strategies is difficult to imitate for those companies who put less weight on risk management, the information quality of such disclosures is high. Managers are the best party to implement and monitor risk strategies against quantitative targets and are therefore accountable for their actions through the publication of risk information. Following the earlier discussion on signalling theory, it seems reasonable to suppose that where firms have applied strategic risk management that aims at mitigating firm-specific threats and creating growth opportunities, managers are more likely to offer the strongest possible quality signals through disclosing more quantitative, operational, and good risk news: if the strategy is genuine, it is pointless to discuss in mere rhetoric. Other competitors may choose to fill risk disclosure sessions with unverifiable rhetorical statements at a relatively

low cost. In light of this, increasing the publication of operational, quantitative and good news signals a superior risk controlling system within a firm; this VRIN strategic resource will influence external investors' risk perception of the firm, and consequently contribute to the reduction of the firm's systematic risk.

3.3. Literature review

3.3.1. Regulatory approaches to forward-looking risk disclosures

The recent financial crisis has left an unforgettable scar on the worldwide economic and financial markets, and threw a hot potato to an entire generation of analysts and investors, questioning what caused the severe consequence (Borio, 2008). There are massive doubts about whether appropriate regulations were in place and if previous provisions triggered lax monitoring and provoked managers' excessive risk-taking (McAleer et al, 2011). The U.S. Securities and Exchange Commission conducted intensive assessments of the risk disclosures in firms' filings. It criticized inadequate risk reporting and proposed that more risk information which might potentially impact future operations should be released (Johnson, 2010).

In 1994, the American Institute of Certified Public Accountants initially suggested firms disclose forward-looking information to provide investors with timely and useful insights. The 1995 Private Securities Litigation Reform Act has built a "safe harbour" from accountability in private lawsuits for firms issuing risk information in forward-looking statements. The reporting guidelines in CICA [11] (2001) proposed a framework of risk reporting containing corporate vision, vital

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[11] The Canadian Institute of Charted Accountants

success features, and result-oriented action capabilities. The documents released by ICAEW[12] (1998, 1999 and 2002) requiring firms to disclose all types of risk that may impose a potential effect on future performance; not only past risks but also forward-looking risks (Rajab and Handley-Schachler, 2009). The ICAEW also suggested many benefits to improving voluntary risk disclosure: the cost of capital would decrease as investors find it easier to estimate the riskiness of their investment project and thus there would be no need to add a risk premium in any financing charge; this also signals directors' superior risk management and an enhancement in risk reporting as a whole (Linsley and Shrives, 2005). Blackburn (1999) states the best practice of Combined Code and the Turnbull report, which required listed firms to adequately clarify their risk management and to provide information on their internal control system. All regulatory approaches explicitly propose to enrich forward-looking risk disclosures. However, forward-looking risks contain the information of future, which are believed to be inherently unpredictable. Managers are therefore reluctant to release this information because they may be vulnerable to claims from investors who make investment decisions on that information (Linsley and Shrives, 2005).

Despite vigorous debates on the regulation of forward-looking risk disclosures, a lack of empirical evidence on the benefits of publishing such information makes it hard to convince both managers and investors of the necessity and urgency for regulatory approaches.

3.3.2. Academic approaches of forward-looking risk disclosures

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[12] The Institute of Chartered Accountants in England and Wales

3.3.2.1. Risk disclosure studies

Fierce debates on risk disclosures arose after the 2007 accounting irregularities, with one view arguing that greater disclosure improves reports transparency, which facilitates investors to better understand the firm's risk profile and make sound evaluations about corporate performance. In addition, more risk disclosures help improve a firm's accessibility to capital markets so as to attract more prospective investors by decreasing their expenses spent on collecting information. This reduction in information gathering costs in turn improves the liquidity of the company's shares, and the increasing demand of these shares prompts a possible reduction in cost of capital (Ekaterina et al, 2007). Amihud and Mendelson (1986) initially establish theoretical support for the negative impact of disclosure volume on a firm's cost of capital. They propose that, by voluntarily publishing more private information, adverse selection problem would decrease in the market, and therefore, reducing additional transaction costs. This would narrow the bid-ask spread, and eventually drive down the cost of capital. Diamond and Verrecchia (1991) complement that, the more voluntary disclosures, the less information revealed by large trades, thereby minimising their influence on pricing. Accordingly, investors are more likely to possess larger proportion in a given firm with more public information. This behavior promotes stocks demand and therefore increases the current share price, which result in relatively lower cost of capital. Similar conclusions can be found in Jorgensen and Kirshcenheiter's (2003) discretionary risk disclosure study, they find that ex-post firms disclosing their risk could enjoy higher stock prices. In addition, compared with a mandatory disclosure regime, a voluntary disclosure regime would experience a lower expected risk premium of all firms. A lower cost of capital brings more funds in the market, which make firms invest in

long-term projects with higher expected return.

Good corporate governance advocators propose that managers should be accountable to investors for their operational risk exposure, and they criticize the fact that information, either the firm's risks or how risk management is organised, is not disclosed enough for shareholders and other stakeholders.

Researches try to identify possible reasons for the lack of risk disclosures, they raise the issue of commercially sensitive information to the financial market. For example, Linsley and Shrives (2005, pp. 294) propose that two potential costs might be incurred by the release of risk information - non-proprietary costs and proprietary costs: "Non-proprietary costs are those costs associated with the costs of information retrieval, whereas proprietary costs are those costs that arise when commercially sensitive information is released with the outcome that the company has provided information of potential value to competitors". Proprietary costs normally recognised as competitively disadvantageous, cause considerable concern to managers. Some firms tend to avoid releasing risk and risk-management information since it is considered commercially sensitive. There is also a rebuttal argument that improved disclosures are targeted to share traders which could cause higher share price volatility and therefore drive up systematic risks and result in a higher cost of capital (Berton, 1994).

In summary, previous researches studying the benefits of risk disclosure on lower cost of capital through strengthening risk control (Linsley and Shrives, 2000; Jorison, 2002), improving stock liquidity (Solomon et al, 2000), and enhancing corporate profitability (Linsley and Shrives, 2006); little empirical research to date have conducted a specific investigation of forward-looking risk disclosures and

therefore it is worth to be examined in this study. In view of the discussed benefits of improving risk disclosure, I make the assumption that more forward-looking risk disclosures lead to lower firm risk.

3.3.2.2. Forward-looking disclosures studies

Previous studies on risk disclosures and forward-looking disclosures have been carried out separately. The role of forward-looking statements in voluntary disclosures is generally related to analysts' earnings forecasts. Bryan (1997) finds forward-looking disclosures concerning operational practices positively and greatly related to one-year ahead earnings changes. He reveals that future short-term performance measures contain useful messages as indicators of future operations and capital expenditure. Similarly, Clarkson et al. (1999) show that total volume of forward-looking information in MD&A (Management Discussion and Analysis) changes in line with corporate future performance variation, which demonstrates the credibility of forward-looking disclosures. Research conclude that the dispersion of analysts' earnings forecasts would be smaller is there are more forward-looking disclosures on firms' operation and capital expenditures (Barron et al., 1999; Clarkson et al., 1999). Moreover, forward-looking disclosures facilitate investors more accurately anticipating share prices, and improve the whole stock market's accuracy in forecasting future earnings movement (Schleicher and Walker, 1999; Hussainey et al., 2003). Kieso and Weygandt (1995) state that lacking forward-looking information will leave investors in a disadvantage position to forecast if they rely on imprecise information through other media channels.

Previous literature on forward-looking disclosures argues that the uncertainty

of future market makes it hard to forecast with credit, and that inaccurate predictions may involve the firm in lawsuits, which is concordant with Field et al.'s (2005) litigation cost hypothesis. Litigation risk is a primary factor that managers need to consider when deciding the content and level of voluntary forward-looking disclosures. Skinner (1994) proposes that firms with high litigation risks would benefit from voluntarily releasing management forecasts, as firms may be confronted with lawsuits when investors claim the managers withhold information that is due to be leased. The concern over potential lawsuits may demoralize managers' motivations to disclose forward-looking information. This is especially true when managers consider that the legal institutions are unable to distinguish among forecast errors due to market uncertainty or deliberate managerial manipulation (Aljifri and Hussainey, 2007). To protect firms against litigation claims is also the main concern that drives firms to publish bad risk news. Even a small firm can bear massive litigation costs: as reported by Cornerstone, after the 1995 PSLRA (Private Securities Litigation Reform Act) the legal defence costs for a single firm typically varied between one and three million dollars, and ranged up to $40 million, which would represent a huge blow to smaller firms. However, Field et al. (2005) indicate that after controlling for the endogeneity between disclosure and litigation, there is a non-positive relationship between issuing forecasts and litigation risks. Moreover, opponents argue that forward-looking information may contain valuable messages to their rivals and might do harm to the competitive level of the firm. Healy and Palepu (2001) propose the similar argument through the proprietary cost hypothesis.

Overall, the main stream of forward-looking disclosure studies proposes that forward-looking disclosures contain valuable incremental information to shareholders and a variety of stakeholders and professional analysts. However, to the

best of my knowledge little empirical evidence has been found regarding forward-looking risk disclosures or an association between the forward-looking risk disclosures and firm's systematic risk. The present study will provide original evidence for the potential usefulness and credibility of forward-looking risk disclosure.

3.3.2.3. Defining risk and forward-looking risk disclosure

Defining 'risk' is the first step before conducting any risk disclosure study. Previous studies have provided two versions of risk definitions. One view defines risk as the possible threat to a firm's wealth accumulation due to a series of internal factors (including financial risks that immediately affect assets and liabilities and non-financial risks which might influence firm's future cash flows) and external factors (related to the general environment where the firm operates) (Cabedo and Tirado, 2004; Kravet and Muslu, 2013). While this view solely incorporates negative outcomes when coding risk information, another definition of risk, which is generally referred as a broad definition of risk, embraces both positive opportunities and negative uncertainties (e.g.,Cabedo and Tirado, 2004; Lupton, 1998). Specifically, one sentence will be classified as risk related if the reader is notified of any 'opportunity' or 'prospect' or any 'hazard, threat or exposure' information, which has already impacted or may have a potential impact on firm wealth, or the communication of managers' risk mitigation and opportunity seizing strategies and internal control risk management policies (Cabedo and Tirado, 2004). This study will adopt the broad definition of risk when analyzing risk disclosure information, consistent with Lupton's (1998) argument about how 'risk' is broadly used and

recognized in colloquial language.

The second step is to define forward-looking risk disclosure. According to CICA (2001), forward-looking information complements financial and non-financial information to help investors better evaluate managerial decisions on corporate long-term value generation. Beretta and Bozzolan (2004) explain forward-looking information as: "(i) future events, decisions, opportunities, and risks that may have a likely effect on future results; (ii) visions, strategies, and objectives expressed by management; and (iii) explanations of past events, decisions, facts, and results that may have a significant impact on future results". Similar definitions of forward-looking disclosure can also be found in Aljifri and Hussainey's (2007) paper which allow shareholders and other stakeholders to evaluate a firm's performance in future through its current reports and future plans. This involves financial forecasts (e.g., earnings forecast) for the following year, expected proceeds and anticipated cash flows, and non-financial forecasts for instance risk and uncertainties that might greatly impact expected achievements and result in deviation from projected targets.

Forward-looking risk disclosure in this study refers to any risk-related information that informs readers about future potential opportunities or threats and uncertainties arising from the interaction of external environmental and market risks and internal operational risks, or else any descriptive information concerning the internal control of risk management policies.

3.3.2.4. Forward-looking risk disclosure categorisation

Previous studies on risk disclosure have set different ways to categorise risk information and they share many cross-components. Jorion (1997) proposes that firm

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risks consist of potential risks from business, strategy and finance. Specifically, business risks relate to the product market where a firm operates, including innovations activities, business marketing and production design. Strategic risks relate to the economic and political environment changes. Financial risks include liquidity risks, price or market risks, credit risks, operational risks and legal risks. Jorion (1997) only considers potential negative factors when identifying risk-related information. This risk classification finds support from the ICAEW (1997). Institute analysts sort the risks into external risks and internal risks. The former refer to general operating environment, equivalent to Jorion's (1997) "strategic risks", and the later are subcategorized as financial and non-financial risks. Thus, financial risks directly affect firms' monetary characters whereas non-financial risks have impacts on business operation and will potentially influence cash flows and profits in the long run. This is similar to Jorion's (1997) "business risks". Another strand of studies (e.g.,Linsley and Shrives, 2006; Oliveira et al., 2011) that adopt a broad definition of risk has presented a likeness in risk categorisation. When comparing risk disclosure between British banks and Canadian banks in their annual reports, Linsley et al. (2006) sort risks into six categories, namely, credit risk, market risk, interest rate risk, operational risk, capital structure and adequacy risk, risk management frameworks and policies. Oliveira et al. (2011) complement this research by adding liquidity risk and renaming policies as "Generic". However, these risk categorisations emphasize financial risks and are more applicable to financial institutions' risk disclosure studies.

The present study will classify risk-related information as representing a financial risk, operational risk, or strategic risk. Financial risks relate to the financial information published by the company that will have direct impacts on monetary

characters. This study expands the financial risk definition by adding more financial factors that are beyond board control - for example, commodity, taxation, inflation, and market risk. Operational risks involve those internal risks that are within the control managers and firm-specific opportunities that companies willing to pursue so as to increase shareholders' value and achieve competitive advantages (Jorion, 1997). Internal non-financial risks, or indirect financial risks, would influence the daily operation of the business. Strategic risks refer to general environmental factors within which a company operates. Those factors are beyond the organisational control. Internal control risk management strategies are commonly disclosed in 'corporate governance' section in annual report, and discuss companies' risk management policies. All risk-related sentences will be distinguished according to their time-orientation (forward-looking disclosures, and past disclosures). Then, the risk information within the identified time-frame will be further classified according to risk disclosure categories (Financial risk, Operational risk, or Strategic risk), the nature of disclosure (quantitative or qualitative) and the type of news (good, bad, or neutral). Risk disclosure categories and typical examples of each type can be found in Appendix 3.1 and 3.2 respectively.

3.4. Hypothesis development

3.4.1. The difference among good/bad/neutral forward-looking risk disclosures

Prior research on the disclosure volumes of good and bad risk news have not reached definitive conclusions. One view suggests that directors intuitively tend to release 'good news' in order to obscure poor performance through a more complicated writing style of annual reports, to obfuscate the real disadvantageous risk message to

readers. Because future risk disclosure creates uncertainty amongst executives, they are hesitant to indicate whether the effect is prone to be positive or negative. Beretta and Bozzolan (2004) find evidence that the "attributional inclination" happens when managers are describing bad risk news. It is suggested the executives' intention is to distract investors' attention from the most serious problems, yet imply hidden credibility threats in the long run.

Conversely, Linsley and Shrives (2006, pp.392) state that, regardless of directors' self-protective preference on publishing good risk news, it does not necessarily lead to their withholding bad news if this might result in "excessive reputational costs and jeopardise relationships with external parties, or if legal costs could result from negative earnings surprises". By analysing the risk information disclosure in a number of Canadian company financial statements, Cabedo and Tirado (2004) find the dominance of negative risk information. Similar findings are reported by Linsley and Shrives (2000) who base their research on a British sample. Therefore the first hypothesis for the current study is:

H1a: The number of good forward-looking risk disclosures is significantly different from bad forward-looking risk disclosures;

H1b: The number of bad forward-looking risk disclosures is significantly different from neutral forward-looking risk disclosures;

H1c: The number of good forward-looking risk disclosures is significantly different from neutral forward-looking risk disclosures.

3.4.2. The difference between quantitative/qualitative forward-looking risk disclosures

Quantitative risk disclosure is commonly viewed of higher quality as it promotes the credibility of risk information and makes it "ex-post verifiable" (Schrand and Elliot, 1998). Despite regulatory efforts to encourage or oblige informative risk disclosures, investors and academics still claim that firms are reluctant to provide quantified risk information. One factor that gives rise to this deficient disclosure is the ever-changing and unpredictable nature of risk (Kravet and Muslu, 2013). Future risks are intrinsically harder to measure and quantify thus managers are anxious they will be judged upon, and held to account against, the published quantitative risk information if found erroneous. In addition, quantitative risk information may contain sensitive messages to competitors, thus incurring a high proprietary cost and leaving the company in a disadvantageous situation. Therefore the second hypothesis is:

H_2: The number of quantitative forward-looking risk disclosures is significant less than the number of qualitative forward-looking risk disclosures.

3.4.3. The impact of forward-looking risk disclosures on firms' risk

Linsley and Shrives (2006) suggest more risk disclosures could impact on the public risk perception of the firm. It can be argued that greater disclosure enhances transparency, which will allow investors to better understand a firm's risk profile and make sound evaluations about corporate performance. The improvement of investors' decisions lowers their uncertainty about firms' future cash flows. Lambert et al. (2007) state that in firms which publish future risk in more precise nature, the covariance between one and another firm's cash flows exhibits declining tendency.

Supporters of greater risk disclosure suggest that, in good corporate governance practice, managers are accountable to shareholders and other stakeholders for their judgment decisions based on published risk information. If more risk information is disclosed, the asymmetric information between managers and shareholders will decrease, and internal shareholders' and external potential investors' and the general public's ability to discipline managers will be greatly enhanced. In fear of losing their positions, managers are more motivated to adopt effective risk management, carry out efficient specific risk mitigation strategies, and capture potential growth opportunities, thus decreasing firms' systematic risk. In this way, more forward-looking risk disclosures contribute to lower firm risk. Moreover, more risk disclosures can be seen as a signal of directors' superior risk management (Linsley and Shrives, 2005).

Another view holds that more disclosed risk information helps improve a firm's accessibility to capital markets so as to attract more prospective investors by decreasing their expenses spent on collecting information. This reduction in information gathering costs in sequence improves the liquidity of a company's shares, and a possible decrease in cost of capital (Diamond and Verrecchia, 1991; Ekaterina et al., 2007). "Information asymmetry widens the adverse-selection component of the bid-ask spread demanded by the market makers and thus increase the cost of trading in a security. In equilibrium, security prices settle at levels that yield investors equal rates of risk-adjusted return, net of the transaction cost, on each security" (Kothari, Li and Short, 2009, pp. 1645).

Thirdly, the mis-evaluation of the parameter values of the expected rate of return on target securities constitute another component of cost of capital, which is widely regarded as non-diversifiable risk. More disclosed content allows analysts

and investors to reduce the estimating error of parameters, therefore decrease the cost of capital (Barry and Brown, 1984).). When the cost of capital decreases, financial returns increase, and firms will have more cash flow to undertake promising projects in a virtuous circle. All these factors will lead to a firm with healthy financial prospects, fewer financing constrains, and a greater ability to seize value-adding investment opportunities when they become available. From the perspective of investors, they can avoid injecting money into firms that are experiencing financing constrains and might bet on riskier projects in the hope of achieving a higher return in the short term, and this inevitably drives up the risk level of a firm. Resultantly, the third hypothesis is:

H_{3a}: There is a significant negative relationship between the quantity of forward-looking risk disclosures and firm risk.

In their UK study, Linsley and Shrives (2006) report significant differences in the frequencies of reported of different risk categories. I then follow their approach and disaggregate the number of forward-looking risk disclosures into different subcategories: according to their business focus (financial, operational, strategic); according to their nature (quantitative, qualitative); according to their tone (positive, negative, neutral), and then test the associations between these characterises of risk disclosure and firm risk.

Financial risk disclosure is important in helping analysts to better anticipate future earnings numbers. However, recent evidence from Australia suggests that these results could be context specific. Reason could be found from Coram et al.'s (2011) interview of eight financial analysts (Sydney and Perth stockbrokers) that the perceived value of enhanced financial disclosure is context-specific where analysts

pay more attention to negative financial information while are more sceptic concerning positive financial information. Operational risk refers exclusively to firm-specific internal risks that are within the control of the board, while strategic risks describe the external operating and natural environment that are beyond the control of companies' directors. For the sake of better understanding firm's inner operational situation, analysts weight higher of non-financial information disclosures than financial disclosures, and of the two subcategories of operational and strategic risk disclosures, it can be expected of higher utility of firm-specific operational risk disclosures to analysts evaluate firms' risk exposure. Therefore, I hypothesise:

H_{3b}: There is a negative relationship between financial risk disclosure and firm risk; there is a negative relationship between operational risk disclosure and firm risk; there is a negative relationship between strategic risk disclosure and firm risk.

Theory dealing with the salience of negative information presents that positive information receive less attention than negative information (Coram et al., 2011). On the contrary, signalling theory indicates managers tend to pass positive signals to outside investors in order to demonstrate the effective risk management system within the firm. And most likely, managers have to publish credible positive information as fraudulent disclosures will be penalised in the future. To investigate this contextual dimension, I disaggregate Total into good news, bad news and neutral news. Prior literature present evidence that bad news (unfavourable information) correlates with higher cash flow risk, whereas good news (favourable information) correlates with lower risk of estimating future cash flows in both short-term period (French et al., 1987) and long-term period (Chan, 1988; Ball and Kothari, 1989). Ng et al. (2009) find good news would lower the adverse-selection component of the bid-ask spread, however bad news would increase return volatility of future earnings.

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Meanwhile, investors rely on disclosure content to evaluate the expected firm value and the uncertainty associated with that value. Therefore, the information content is likely to affect adverse selection cost through investors' evaluation of uncertainty. And in sequence the effects are expected to be reflected in firms' cost of capital and accuracy of analysts' earnings forecast. Kothari, Li and Short (2009) and Campbell et al. (2014) and find good news (favourable disclosures) lowers firm's risk (proxied by cost of capital, stock return volatility and analyst forecast dispersion), whereas bad news (unfavourable disclosures) increases firm's risk. In particular, they argue that bad news has two directional effects on cost of capital: firstly it provides news information to market makers that the firm is riskier than they originally assessed, which increases the cost of capital; secondly, it increases the precision with which market participants estimate the cost of capital, which lowers the cost of capital. These two effects mutually offset one another, however the primary effect on cost of capital is an increase. Survey studies by Graham et al. (2005) find that corporate executives expect a risk premium with less predictable earnings (higher earnings volatility and uncompleted earnings target), which explains that investors expect higher rate of return on invested equities for bearing additional risk when more bad news disclosures become available. To give greater level of insight I quantify good news, bad news and neutral news, and this content disaggregation permits me to have the following hypothesis:

H_{3c}: There is a negative relationship between good news and firm risk, while bad news and neutral news would not show a significant lowering effect on firm risk.

Regarding the numerical nature of the disclosure content, Kadous et al. (2005) suggest that the quantification of a project proposal improves its persuasiveness among investors as the credibility of disclosure content can be greatly improved.

Likewise, the difficulties to quantify future risks make the quantitative disclosures more valuable to investors. For the fear of being exposed to future legal claims when irretrievable errors in judgment occur that is based on published yet erroneous estimation of future risk; executives are therefore inclined to avoid discussing unpredictable future risks in a quantitative tone. In addition, assessing the quality of forward-looking risk disclosures is not infallible, mainly due to lack of reliable and credible data (Frame, 2003) and the limitation of risk measurement techniques (Linsley and Shrives, 2006). All the factors could result in substantial variation of the eventual risk outcome and the subsequent judgement. Therefore, I have the following hypotheses:

H$_{3d}$: There is a significant negative relationship between quantitative risk disclosure and firm risk; there is an insignificant negative relationship between qualitative risk disclosure and firm risk.

3.5. Methodology

3.5.1. Measure the quantity of forward-looking risk disclosure

Content analysis has been widely used in accounting disclosure research; it can be used to identify either the presence or absence of a theme in written reports and other verbal materials; additionally it allows disclosures to be systematically categorised and compared (Rajab and Handley-Schachler, 2009). This research uses this methodology mainly because risk disclosures, particularly non-financial categories, are mostly disclosed qualitatively and content analysis enables coders to measure the extent and volume of that disclosure information.

In content analysis, scholars use different counting measures including words, phrases, sentences, pages and number of lines (Rajab and Handley-Schachler, 2009). In a previous study, Hussainey et al. (2003) adopt automated text recognition software to count keywords that identify risk-related information in corporate annual reports. Gietzmann (2006) uses raw disclosure data from the London Stock Exchanges Regulatory News Service, and argues that this source provides timely information that is date and time stamped, and can be categorised by topic, allowing for the calculation of additional disclosure measures. The present study measures the volume of forward-looking risk disclosures by counting risk and risk management sentences rather than words or phrases as this approach is widely recognized as a more accurate coding method. This method requires the present author to read through each annual report and identify all sentences containing risk-related information. Sentences will be coded as risk disclosures if they deliver messages pertaining to risks (any "opportunity" or "prospect" or any "hazard", "threat" or "exposure") (Cabedo and Tirado, 2004). The word 'risk' does not need to appear in an examined sentence for it to be recognised as a risk disclosure sentence. Hussainey et al. (2003) indicate that during the coding process, some sentences may be categorised as past disclosure while they also contain information that is relevant to the future. For example, regarding a message that the Research and Development (R&D) costs within a firm increased by 10% in the preceding accounting year: this information belongs in the past disclosure category; however, it also conveys the meaning that investment in R&D is expected to increase the firm's future cash flows. In the coding process, final decisions concerning time orientation will pertain to whether the sentence delivers information that would impact on further actions that will carry on in the future operation of the firm. This research acknowledges the

potential for semantic ambiguity in coding process, and uses verb tense to categorise the time orientation of risk sentences.

In the implementation of content analysis, some basic stages need to be clarified: the research question (measuring the quantity of forward-looking risk disclosures and association with firm risk level); the codable document (corporate annual reports of 2010); the coding unit (sentence); disclosure categories (e.g., financial risk, operational risk, strategic risk) (see appendices 1 and 2 for risk disclosure categories and examples); the coding mode (manual); and last of all, the coded information as subjected to interpretation (Rajab and Handley-Schachler, 2009).

As to the location of the risk information, previous studies of American companies find risk information spread throughout Management Discussion and Analysis (MD&A) and notes on financial statements (Beretta and Bozzolan, 2004). In the UK, sample companies' Operating and Financial Reviews, the equivalent of the MD&A (which is non-mandatory), is the main source of narrative risk disclosure (Linsley and Shrives, 2002). The Combined Code on Corporate Governance, published by the London Stock Exchange in 1998, demands listed companies keep an effective internal control system and also clearly explains risk management policies in the 'Corporate Governance' section. The present research will look at all voluntary narrative disclosures within annual reports which include Directors' Reports, CEO/Managing Directors' Reports, Chairman Reports, Reviews of Operations, Principal risks and uncertainties, Corporate Governance (Internal Control and risk management). Remuneration, board independence, and other such corporate governance issues are not considered; Corporate Social Responsibilities (personnel, health and safety) are considered, to identify risk information

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(O'Sullivan et al., 2008).

The dependent variable - forward-looking risk disclosure - is dichotomous. It is assigned a value of one if a firm discloses forward-looking risk information in their annual report and zero otherwise (O'Sullivan et al., 2008). All identified risk disclosure sentences will be coded following the disclosure coding grid (see Table 3.1):

Table 3.1

Disclosure coding grid

Disclosures sentence characteristics	Financial risk	Operational risk	Strategic risk	Internal control risk management policies
Qualitative/good/forward-looking				
Qualitative /bad /forward				
Qualitative /neutral/forward-looking				
Quantitative/good/forward-looking				
Quantitative /bad/forward-looking				
Quantitative /neutral/forward-looking				

Notes: Quantitative disclosures consist of sentences that quantifies the risk impact "either directly in monetary terms or if the reader is able to quantify the past or potential future monetary impact of a risk albeit indirectly" (Linsley and Shrives, 2005, pp.296). If a sentence cannot be easily categorised under one category, it will be double examined and grouped into the class that the sentence mostly emphasized.

Kravet and Muslu (2013) develop a UNIX perl code to identify forward-looking disclosures that indicate future risks or uncertainties. Specifically, the code tags a sentence as forward-looking risk-related if it contains at least one keyword that connotes risk. These keywords (where a (*) implies that suffixes are allowed) are: "can, cannot, could, may, might, risk(*), uncertain(*), likely to, subject to,

potential(*), vary(*), varies, depend(*), expos(*), fluctuat(*), possibl(*), susceptible, affect, influenc(*), and hedg(*) ." This study will adopt this code to complement measurement of the content of forward-looking risk information by counting the number of sentences with at least one of these keywords.

I firstly adopt the UNIX perl code to identify risk sentences within the annual reports of 20 randomly-chosen companies. After reading them carefully I found almost all tagged sentences were risk-related, which shows the effectiveness of the code words. In the "Principal Risks and Uncertainties" section, which contains the most intensive risk information, nearly all sentences were tagged with at least one of the UNIX perl code key words. This list is not exhaustive; after careful examination of the narrative parts of the 20 annual reports, more code words were added as an expansion of Kravet and Muslu's (2013) UNIX perl code to capture the meaning of future, performance and strategic decisions of the firm. These words were: opportunit*, prospect, expect, impact, outlook.

The most frequently appearing words - "can, could, may, might" - are polysemous; they can infer future prospective and can also be understood as "be able to" and do not imply a specific time orientation. However, if I solely relied on the computer software to identify risk-related sentences, there is a risk of unreliable data because of the 'boiler plate' word problem (Abraham and Cox, 2007). Thus in the second step I carried out a manual examination of all tagged risk-related sentences to filter sentences that contained a 'boiler word' but merely discussed risk information. The combination of the two approaches is an experimental practice that will decrease the subjectivity of manual content analysis, and takes advantage of computer software's mechanical nature.

3.5.2. Model specification

In line with previous research, a group of underlying corporate characteristics (accounting variables) that might influence a firm's risk level need to be identified before regression. The level of firm risk is measured by *BETA* from London Business School's *Risk Management Service*. Prior research (e.g., Alexander and Thistle, 1999; Lord and Beranek, 1999) suggest a negative relationship between firm size and systematic risk. They adopt different measures of firm size including turnover, total assets, market capitalization and employee numbers. As there is no theoretical reason to prefer one method to the others, this study will estimate firm size (*SIZE*) by the natural log of total assets[13]. Previous research find a significant negative association between dividend payout ratio and firm risk, therefore I control for the dividend payout (*POUT*), measured by dividing dividends per share by the adjusted net earnings per share for the previous accounting period (Salama et al., 2011). Liquidity (*LIQU*) is widely viewed as a useful factor in forecasting a firm's risk (Ferris et al., 1990). Liquidity variable is estimated by current ratio (Abdelghany, 2005), calculated by the percentage of total current assets to total current liabilities. Another well acknowledged determinant of firm risk is leverage. It is often proposed that the more debt a firm holds in its capital structure, more likely the firm will default, and subsequently its total equity will be valued much lower (e.g., Baxter, 1967; Bierman, 1968; Ben-Zion and Balch, 1973). Hence I control for the leverage (*LEV*), which is calculated by total debt/total capital. Moreover, there is empirical evidence for an association between firm risk level and corporate asset growth (Salama et al., 2011). Therefore asset growth (*GROW*) is also controlled as a determinant of firm risk. This study uses the percentage of TA_t / TA_{t-1} to measure

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[13] Using the natural log of total number of employees to measure firm size yields similar results.

asset growth, where TA is the book value of total assets. Another variable that has often been considered as a determinant of risk is profitability, which will be measured by return on capital employed (*ROCE*). Finally, I control for the industry impact using dummy variables (*IND*).

The present research modifies the model used in Salama et al. (2011) to assess the risk level of sample companies. It tests whether forward-looking risk disclosures contribute to firms' risk reduction.

$$BETA_{i,t+1} = \beta_0 + \beta_1 FRD_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 POUT_{i,t} + \beta_4 LIQU_{i,t} + \beta_5 LEV_{i,t}$$
$$+ \beta_6 GROW_{i,t} + \beta_7 ROCE_{i,t} + \beta_8 IND_{i,t} + \varepsilon_{i,t} \qquad (3.1)$$

where:

$i = 1\ldots216$

$t = 2010$

BETA = firm risk from London Business School's Risk Management Service

FRD = The quantity of forward-looking risk disclosures

SIZE = Natural log of total assets

POUT = Dividend payout

LIQU = Current ratio

LEV = Natural log of equity gearing

GROW = Natural log of asset growth

ROCE = Return on capital employed

IND = Industry dummies

3.6. Data collection

The original sample consists of 240 non-financial institutions listed within the FTSE 350 Index in 2010, based on the published FTSE 350 companies list of 2010 by Thomson Reuters. The sample is further reduced due to the unavailability of accounting data and beta, thus leaving 216 observations. All annual reports are collected from the corporate websites with a year-end date nearest to 1st January 2011. The risk disclosure measures in this study are limited to the information published in annual reports. Arguably, annual reports might not yield a powerful proxy for overall risk disclosures in an accounting year when firms might choose to release complementary and timely risk information through company websites or other media channels and when a substantial source of information is disseminated by financial analysts. This is acknowledged as one potential shortcoming of this research. Financial institutions are excluded from the sample since the nature of these firms varies considerably from that of non-financial firms and this difference can be expected to have a significant effect on the risk disclosure approaches of the two groups (Linsley and Shrives, 2006). The FTSE 350 Index is chosen as it comprises the largest listed firms in UK based on corporate market capitalisation. Prior literature indicates firm size is positively associated with corporate voluntary disclosure in both quantity and quality (O'Sullivan et al., 2008), where larger firms are found to release more risk information than smaller firms (Linsley and Shrives, 2005). With regard to voluntary forward-looking disclosures, Choon et al. (2000) find larger firms are more likely to release earnings forecasts than smaller firms. Thus, the FTSE 350 Index is chosen to filter the sample with comparable firm size. Most previous research (e.g., Abraham and Cox, 2007; Linsley and Shrives, 2006) choose their sample from the FTSE 100 Index; this study explores the forward-looking risk disclosure of a comparatively large sample for the first time. I limit my

analysis to one year, given firms' disclosure practices appear to remain reasonably constant over time. This is the normal empirical approach to analysing risk disclosure level and content (e.g., Linsley and Shrives, 2005, 2006; Abraham and Cox, 2007; Botosan, 1997). Admittedly, the year-to-year disclosure observations for a single firm are not independent; I choose to obtain greater cross-sectional observations as opposed to observations over time. The year 2010 is chosen considering 2010 is generally viewed as a threshold when the final market started to pick up following a period of severe market recession and volatility following the 2007 financial crisis. Thus, listed firms are expected to place greater value on risk disclosure to win back investors' confidence. Another reason for this selection is that this represents the most recent empirical evidence in the wake of the 2007 financial crisis that has not yet been examined by any previous published papers and is to ensure reasonable access to firms' annual reports yet still guarantee other post-sample year data would be obtainable.

3.7. Empirical results

3.7.1. Summary statistics

Tables 3.2 and 3.3 report the correlation metrics between dependent variable risk (*BETA*) and main explanatory variable total quantity of forward-looking risk disclosure (*FRD*). Noticeably, there is a negative and significant correlation between *FRD* and *BETA* with a coefficient of -0.117, the magnitude of this correlation increase to -0.128 if considering internal control risk management policies (see Table 3.3). This evidence supports the hypothesis 3 that the greater extent to which risk sentences are forward-looking, the lower a firm's systematic risk. The correlation is

stronger if internal control risk management policies are specified in the corporate governance section. This reflects that a specified statement of risk management policies contains information that is valuable to investors.

Moreover, there is a positive correlation between $Total_0$ and firm size, with a coefficient of 0.538, noticeably higher than other possible influential variables of the number of risk disclosures. This supports previous literature that big firms tend to disclose more risk information (e.g., Beretta and Bozzolan, 2004; Linsley and Shrives, 2006). For all remaining variables, variance inflation factors were within levels of tolerance for multicollinearity.

Table 3.2

Correlation matrix1

Variables	$BETA_{2011}$	$Total_0$	POUT	GROW	SIZE	LIQU	GEAR	ROCE
$BETA_{2011}$	1.000							
$Total_0$	-0.117[*]	1.000						
POUT	-0.192[*]	0.004	1.000					
GROW	0.036	0.059	-0.229[*]	1.000				
SIZE	-0.108	0.538[*]	0.043	-0.064	1.000			
LIQU	0.041	-0.098[*]	-0.297[*]	0.319[*]	-0.197[*]	1.000		
GEAR	-0.170[*]	0.142	0.103	-0.314[*]	0.278[*]	-0.436[*]	1.000	
ROCE	-0.125[*]	-0.104	0.054	0.229[*]	-0.244[*]	0.042	-0.133[*]	1.000

Note: $Total_0$ is total number of risk disclosures exclude internal control risk management policies; [*] indicates significance at 10% level.

Table 3.3

Correlation matrix2

Variables	$BETA_{2011}$	$Total_1$	POUT	GROW	SIZE	LIQU	GEAR	ROCE
$BETA_{2011}$	1.000							
$Total_1$	-0.128[*]	1.000						
POUT	-0.192[*]	0.010	1.000					
GROW	0.036	0.057	-0.229[*]	1.000				
SIZE	-0.108	0.532[*]	0.043	-0.064	1.000			
LIQU	0.041	-0.101	-0.297[*]	0.319[*]	-0.197[*]	1.000		
GEAR	-0.170[*]	0.158[*]	0.103	-0.314[*]	0.278[*]	-0.436[*]	1.000	
ROCE	-0.125[*]	-0.097	0.054	0.229[*]	-0.244[*]	0.042	-0.133[*]	1.000

Note: $Total_1$ is total number of risk disclosures include internal control risk management policies; [*] indicates significance at 10% level.

Table 3.4 depicts the average value for beta and forward-looking risk disclosures in different industries. Their values vary substantially across different sectors. Interestingly, whilst Healthcare and Utilities sectors with low betas disclose the most forward-looking risk information, the Technology sector, with a high beta, published the lowest volume of forward-looking risk information. This implies a possible negative relationship between the quantity of forward-looking risk disclosures and firm risk level relative to specific industries.

Table 3.4

Sample industry coverage and variable mean values

Industries	$BETA_{2011}$	$Total_0$	$Total_1$	No. of observations
Basic Materials	1.19	146	163	24
Consumer Goods	0.92	100	113	25
Consumer Services	1.04	100	116	55
Health Care	0.82	180	200	8
Industrials	1.10	121	137	57
Oil & Gas	1.10	144	156	16
Technology	1.12	99	112	17
Telecommunications	0.99	111	119	5
Utilities	0.67	152	168	9

Notes: Variables are winsorised at the 5% level. $Total_0$ is total number of risk disclosures exclude internal control risk management policies, $Total_1$ is total number of risk disclosures include internal control risk management policies, $BETA_{2011}$ represents corporate systematic risk.

A total number of 29,021 forward-looking risk disclosure sentences were identified within companies' annual reports in my sample. The detailed risk categorizations and sentence characteristics that these disclosures fall within are presented in Table 3.5.

Table 3.5

Risk disclosures for sample companies

	Financial risks	Operational risks	Strategic risks	Sub-total	Internal control risk management policies	Total	Proportion (%)
Text disclosures sentence characteristics							
Good news/Quantitative	34	461	232	727	0	727	3%
Bad news/Quantitative	41	63	82	186	0	186	1%
Neutral news/Quantitative	227	365	299	891	6	897	3%
Good news/Qualitative	119	2,414	1,553	4,086	0	4,086	14%
Bad news/Qualitative	1,029	3,355	3,663	8,047	0	8,047	28%
Neutral news/Qualitative	2,320	5,351	4,100	11,771	3,307	15,078	52%
Good news	153	2,875	1,785	4,813	0	4,813	17%
Bad news	1,070	3,418	3,745	8,233	0	8,233	28%
Neutral news	2,547	5,716	4,399	12,662	3,313	15,975	55%
Quantitative	302	889	613	1,804	6	1,810	6%
Qualitative	3,468	11,120	9,316	23,904	3,307	27,211	94%
Total	3,770	12,009	9,929	25,708	3,313	29,021	100%
Proportion (%)	13%	41%	34%	89%	11%	100%	

The two codes that reveal the largest numbers of disclosures are operational/neutral/qualitative (5,351) and strategic/neutral/qualitative (4,100). The operational/neutral/qualitative risk disclosures describe risks arising from the people, systems and processes through which a company operates and the corresponding risk mitigation strategies in a neutral and qualitative context. A typical example of this type of disclosure would be: "Group-wide operational procedures and standards are in place and enforced in all business units. There is also a robust supervision structure which allows management to monitor the progress and delivery of the group's contracts and customer relationships" (G4S annual report, 2010, p.50). Risk disclosure studies that predate the 2007 financial crisis criticize the inadequacy and lack of clarity that defined firms' internal operational risk disclosures (Linsley and Shrives, 2006); however, the dominance of operational risk disclosures in this research (12,009; 41%) signals an improvement in risk disclosures following the crisis.

Strategic/neutral/qualitative risk disclosures refer to general operating environmental factors that are beyond a board's control. These encompass sentences such as: "Such changes in dynamics could include new technologies, government legislation or customer consolidation and could, particularly if rapid or unpredictable, impact the group's revenues and Profitability" (G4S annual report, 2010, pp.50).

Another pertinent finding is that the total number of financial risk disclosures (3,770) is much lower than that of operational (12,009) and strategic risk disclosures (9,929). One possible reason for this is that the majority of the sample companies put financial risk information in the "Notes to the Financial Statement", which falls outside the narrative voluntary risk disclosures that are the extent of this research, thus only limited forward-looking financial risk information is found in the coding

process compared with operational and strategic risk disclosures. This is a main difference between previous risk disclosure studies. In a widely-referenced paper by Linsley and Shrives (2006), the total number of financial risk disclosures showed no substantial variation compared with other main risk categorisations: operational risk, integrity risk, strategic risk. It can be stated that some financial risk factors - such as inflation, currency fluctuations and taxation - are beyond the control of any company, and they are common risks that face every company. Thus, executives have more incentive to publish firm-specific risks to potential investors rather than describing the general financial environment which investors can source information on from other media. This endorses Gietzmann's (2006) argument that "the information that sophisticated institutional investors value most is non-routine company-specific non-financial information that cannot be readily collected (and validated by) from other sources". Another reason may be that risk disclosure formats and styles are continuously changing; meanwhile accounting authorities and policy makers are working on transparency and informativeness of risk disclosure, especially following the 2007 financial crisis. These factors will all have an impact on the risk disclosure practices nowadays.

Overall, the average number of forward-looking risk disclosure per annual report is 134 sentences. Table 3.6 presents descriptive statistics for the sampled companies.

Table 3.6

Descriptive statistics

	Mean (Median)	S.D.	Min (Max)	Skewness	Kurtosis
Forward-looking risk disclosure variables					
Total number of risk disclosures$_0$	119 (110)	65.10	26 (455)	1.883	8.444
Total number of risk disclosures$_1$	134 (122)	70.01	28 (480)	1.789	7.901
Number of financial risk disclosures	17 (14)	13.63	0 (75)	1.437	5.252
Number of operational risk disclosures	56 (50)	33.51	7 (233)	1.899	8.903
Number of strategic risk disclosures	46 (38)	31.48	3 (199)	2.061	9.101
Number of good news disclosures	22 (19)	16.46	0 (102)	1.923	8.552
Number of bad news disclosures	38 (30)	33.21	3 (234)	2.898	13.372
Number of neutral news disclosures	58 (55)	31.11	6 (226)	1.282	6.549
Number of quantitative risk disclosures	8 (6)	7.73	0 (45)	1.783	7.095
Number of qualitative risk disclosures	111(99)	60.45	26 (417)	1.948	8.827
Other variables					
BETA$_{2011}$	1.04 (1.05)	0.27	0.56 (1.52)	0.007	2.027
SIZE	14.47 (14.32)	1.41	12.36 (17.3)	0.485	2.413
POUT	34.57 (38.14)	21.16	0 (68.56)	-0.286	2.020
LIQU	1.56 (1.32)	1.01	0.46 (4.52)	1.553	4.975
GEAR	33.53 (31.25)	23.97	0 (82.22)	0.404	2.294
GROW	0.09 (0.06)	0.13	-0.09 (0.42)	1.076	3.696
ROCE	13.36 (11.59)	9.24	0.31 (35.00)	0.758	2.894

Notes: Total$_0$ is total number of risk disclosures exclude internal control risk management policies, Total$_1$ is total number of risk disclosures include internal control risk management policies, BETA$_{2011}$ represents corporate systematic risk; SIZE is measured by taking the natural logarithm of total assets; POUT is dividend payout; LIQU is measured by current ratio, using total current assets divided by total current liabilities; GEAR, log of equity gearing, calculated by total debt over total capital; GROW, stands for asset growth, is calculated by log of TA_t/TA_{t-1}, where TA is the book value of total assets; ROCE, return on capital employed.

Test for mean equality between number of good/neutral news disclosures, number of good/bad news disclosures, number of bad/neutral news disclosures, number of quantitative/qualitative news disclosures are all significant at 1% level.

The variation in the total number of disclosures is large, with a minimum of 28 sentences, a maximum of 480, and a standard deviation of 70.01. Noticeably, risk-related sentences appear intensely in the "Principal Risks and Uncertainties", "Internal Control and Risk Management" and "Forward-looking Statement" sections within annual reports (some reports have different but comparable titles), whilst others are dispersed across the narrative sections: the "Chairman's Statement", "Directors' Report", and "Financial, Business and Operational review".

3.7.2. Hypotheses testing

In testing Hypothesis 1, the total number of neutral news (12,662) is significant more than the number of good news (4,813) and bad news (8,233), taking 55%, 18% and 27% of my sample, respectively (see Table 3.5). This provides evidence for my Hypothesis 1. From Table 3.6, the average number of neutral news in each firm is 58 sentences, which is greater than the average number of good news disclosures (22 sentences) and bad news disclosures (38 sentences). The median value for the number of neutral/good/bad news disclosures provide similar evidence, showing 55 sentences, 30 sentences, and 19 sentences respectively. I also report p-values associated with T-tests aimed as accessing whether the average number of neutral news is equal to the average number of good/bad news. The results suggest that the null hypothesis is rejected; indicating the number of neutral news disclosure is greater than the number of good or bad news disclosures. This provides further evidence supporting Hypothesis 1. One possible explanation is that of different risk interpretation. A single coder might have different understanding of a 'risk sentence' in the context of the annual report. For example, if a sentence indicates a cost

increase, this can signal inefficient resources management; however, if placed in its fuller context, the cost increase may be due to the research and development fees incurred by a new product, or from hiring an excellent administrator; thus a short-term cost increase might lead to future profits, and the sentence is more accurately coded as neutral news. Another explanation suggests that some managers intuitively tend to write annual reports more "neutrally" in order to conceal their poor performance. This result is in line with the findings in Beretta and Bozzolan (2004).

In view of the content of good and bad risk news (see Table 3.5), it is noticeable that good news is mostly discussed in operational risk disclosures (2,875), while bad news is frequently included in strategic risk disclosures (3,745). Specifically, within the total 8,233 bad news risk sentences, 45% (3,745/8,233) describe depressed external operating environment. This finding supports previous work suggesting that managers are inclined to attribute negative risk information to external factors (strategic risks) that are beyond their control, while claiming a level of superior risk management.

In testing Hypothesis 2, the total number of quantitative risk disclosures is 1,804 (6% of total risk disclosures exclude internal control risk management policies), while the number of qualitative risk disclosures is 23,904 (94% of total risk disclosures exclude risk management structure and policies) (see Table 3.5). In addition, the average number of qualitative risk disclosures (111 sentences, with the median value of 99 sentences) is greater than the number of quantitative risk disclosures (8 sentences, with the median value of 6 sentences). The p-value associated with T-tests displays the significant difference between these two groups (see Table 3.6), which support our Hypothesis 2 that qualitative risk disclosures dominate total risk disclosures, which is in line with existing literature that indicates

managers tend to describe especially bad news in an obscured manner, rather than to quantify it with according to an immediate monetary impact, attempting to obfuscate the unfavourable information. Linsley and Shrives (2005) criticise this complicated writing style in that it greatly increase readers' difficulties in collecting and understanding risk information. However, it points a direction for future accounting regulation that, in order to improve the credibility of risk disclosure, quantitative risk information should be greatly increased.

To test Hypothesis 3, whether more forward-looking risk disclosures lead to lower risk, OLS (with White heteroscedasticity consistent standard errors) is adopted. Table 3.7 reports the regression output from the risk model.

Table 3.7

OLS Regression of the relationship between $BETA_{2011}$ and total number of forward-looking risk disclosures

$BETA_{2011}$	$Total_0$	$Total_1$
FRD	-0.00060^{**}	-0.00061^{**}
	(0.049)	(0.031)
POUT	-0.00228^{***}	-0.00227^{***}
	(0.003)	(0.004)
GROW	-0.25130^{*}	-0.24787^{*}
	(0.090)	(0.094)
SIZE	0.00644	0.00777
	(0.668)	(0.606)
LIQU	-0.03551^{*}	-0.03546^{*}
	(0.075)	(0.076)
GEAR	-0.00166^{*}	-0.00162^{*}
	(0.053)	(0.059)
ROCE	-0.00496^{***}	-0.00495^{***}
	(0.008)	(0.008)
R^2 adjusted	0.2689	0.2715
No. of observations	216	

Notes: Outliners in all regression variables are winsorised at the 5% level. FRD is forward-looking risk disclosures, $Total_0$ is total number of risk disclosures exclude internal control risk management policies, $Total_1$ is total number of risk disclosures include internal control risk management policies, numbers in parentheses are p-values computed using heteroskedasticity consistent standard errors. ***, ** and * indicate significance at 1%, 5% and 10% level respectively. Industry dummies are included in all specifications but not reported in this results table.

There is a significant negative relationship between the total number of forward-looking risk disclosures (excluding internal control risk management policies) and firm risk (measured by beta). If taking internal control risk management policies into consideration, this result is still consistent. However, the risk lowering effect is quite small in observing its coefficient. Specifically, if holding other factors equal, one standard deviation increase in forward-looking risk disclosures would only lead to a 0.00061 decrease in a firm's beta. This indicates that forward-looking risk disclosure has a significant but low effect on reducing firms' risk.

Given its large number of forward-looking disclosures, the sample is likely to be characterized by considerable heterogeneity. I next investigated whether the sensitivities of forward-looking disclosures varied for different risk categorisations: financial risks, operational risks, and strategic risks. Table 3.8 shows different results across these categories.

Table 3.8

OLS Regression of the relationship between BETA$_{2011}$ and forward-looking risk disclosures

BETA$_{2011}$	Financial risks	Operational risks	Strategic risk	Good news	Bad news	Neutral news	Quantitative risks	Qualitative risks
FRD	0.00089	-0.00126**	-0.00109*	-0.00434***	0.00067	-0.00012	-0.00819***	-0.00053
	(0.519)	(0.027)	(0.072)	(0.000)	(0.244)	(0.857)	(0.001)	(0.110)
POUT	-0.00227***	-0.00226***	-0.00224***	-0.00211***	-0.00228***	-0.00232***	-0.00236***	-0.00228***
	(0.005)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.002)	(0.004)
GROW	-0.25477*	-0.22599	-0.26669*	-0.15314	-0.27539*	-0.25900*	-0.18766	-0.25712*
	(0.094)	(0.128)	(0.072)	(0.288)	(0.070)	(0.091)	(0.207)	(0.085)
SIZE	-0.01159	0.00422	0.00423	0.00102	-0.00110	-0.00743	0.00992	0.00342
	(0.379)	(0.765)	(0.773)	(0.936)	(0.940)	(0.608)	(0.484)	(0.817)
LIQU	-0.03208*	-0.03392*	-0.03556*	-0.03851*	-0.03304*	-0.03342*	-0.02714	-0.03561*
	(0.094)	(0.089)	(0.074)	(0.051)	(0.092)	(0.082)	(0.187)	(0.072)
GEAR	-0.00179**	-0.00165*	-0.00173**	-0.00157*	-0.00168*	-0.00175*	-0.00132	-0.00170*
	(0.039)	(0.053)	(0.046)	(0.060)	(0.051)	(0.042)	(0.128)	(0.048)
ROCE	-0.00504***	-0.00492***	-0.00504***	-0.00492***	-0.00487***	-0.00503***	-0.00502***	-0.00497***
	(0.007)	(0.008)	(0.007)	(0.007)	(0.009)	(0.008)	(0.006)	(0.008)
R^2 adjusted	0.2583	0.2730	0.2667	0.3122	0.2611	0.2568	0.2939	0.2650
No. of observations	216	216	216	216	216	216	216	216

Notes: Outliners in all regression variables are winsorised at the 5% level. FRD is forward-looking risk disclosures. Numbers in parentheses are p-values computed using heteroskedasticity consistent standard errors. ***, ** and * indicate significance at 1%, 5% and 10% level respectively. Industry dummies are included in all specifications but not reported in this results table.

The coefficients of risk disclosure are significant for both operational and strategic categories, at 5% and 10% level respectively. The sensitivity is larger in the former (-0.00126) than in the later (-0.00109), which indicates the disclosure of more forward-looking operational risks, helping drive down firm risk in a more effective way. This can be explained by the nature of the two risks categorisations. Operational risk refers exclusively to firm-specific internal risks that are within the control of the board, while strategic risks describe the external operating and natural environment that are beyond the control of companies' directors. This regression result is in line with previous findings that institutional investors place more value on an individual firm's risks rather than the general market risks which every firm faces. Noticeably, there is no significant association between forward-looking financial risk disclosures and firms' beta; this is largely due to the lack of financial risk disclosures in voluntarily narrative statements within annual reports, as the majority of sample companies discussed financial risks in their "Notes to the Financial Statement", which (as noted above) is fell beyond the remit of this study.

In order to consider another perspective, I divide total forward-looking risk disclosures into good, bad and neutral news. One noteworthy result indicates that beta is only significant (at 1% level) in relation to good news risk disclosures. Moreover, the elasticity of forward-looking risk disclosure (-0.00434) is more sensitive than the total level (-0.00061), which indicates that more good news disclosed will have a greater effect on firms' risk reduction. There is no significant relationship between beta and forward-looking bad news or neutral news. The result can be explained in that good news indicates future opportunities for the company and a prosperous potential. This good news signals profit-adding opportunities in the future; investors are more willing to inject funds in firms with promising

opportunities. In light of this, the firm's risk will fall accordingly.

In respect of forward-looking quantitative and qualitative risk disclosures, I observe a significant negative relationship between quantitative risk disclosures and the beta (at 1% significant level, with an elasticity of -0.00819), but not for qualitative risk disclosures. This indicates that risk disclosures' effect on firm risk can be greatly improved if the size of the risk can be quantified to enable readers to estimate the potential monetary impact of risks more precisely. Kadous et al. (2005) propose a similar argument, suggesting that the quantification of a project proposal can improve its persuasiveness among investors since the project credibility is correspondingly enhanced. Likewise, the difficulties in quantifying future risks make them more valuable to investors. However, the fear of being exposed to potential legal claims when irretrievable errors in judgment occur is based on the published yet erroneous estimation of future risks; directors are therefore more inclined to avoid discussing unpredictable future risks in a quantitative manner. Moreover, assessing forward-looking risk disclosures is not infallible, mainly due to a lack of reliable and credible data (Frame, 2003) and the limitation of risk measurement techniques (Linsley and Shrives, 2006). All these factors might lead to substantial variation of the eventual risk outcome and the original judgment.

3.8. Conclusions

This chapter examines forward-looking risk disclosures within UK annual reports and tests the relationship between the volume of forward-looking risk disclosures and firm risk level. For measures of forward-looking risk disclosure, I use content analysis to count the sentences containing at least one UNIX perl code key word.

The results support the hypothesis that the numbers of good, bad and neutral forward-looking risk disclosures are significant different from one another. Specifically, neutral news dominates total forward-looking risk disclosures. This supports Beretta and Bozzolan's (2004) findings for 85 Italian companies' risk disclosures in that, where future risks are disclosed, directors are reluctant to indicate whether the impact is likely to be positive or negative.

Investigation of quantitative and qualitative forward-looking risk disclosures has revealed that qualitative disclosures occur significant more often than quantitative disclosures, reflecting the findings from general disclosure studies (e.g., Kravet and Muslu, 2013). These results lend support to stake-holder agency theory in that risk disclosures can be used as an instrument for risk handling if there is room for discretion.

It is also worth noting that forward-looking risk disclosures intensively appear in "Principal risks and uncertainties" and "forward-looking statements", whilst others are dispersed throughout the reports. However, the significant increase of forward-looking operational risk disclosures compare with the dominance of general statements of risk policy (Linsley and Shrives, 2006) can be seen as a sign of improvement in risk disclosures in the wake of the 2007 financial crisis. However, managers' preference to attribute bad news to external factors and a lack of quantitative risk information needs to be improved in future accounting regulatory reports.

A significant negative association is found between the volume of forward-looking risk disclosures and the level of firm risk, measured by beta; however, one standard deviation increase in forward-looking risk disclosures would only lead to a

slight decrease of the beta value. This supports the stake-holder agency theory in that if managers selectively publish limited forward-looking risk information, and therefore fail to satisfy the information requirements of other stakeholders, investors may consider the company a risky investment because this might later incur costly explicit claims (i.e. a risk of litigation). Additionally, other stakeholders may assume an inefficient level of internal risk management and a restricted ability of managers to obtain capital at consistent rates (Salama et al., 2011). From the perspective of different risk categorisations - financial risks, operational risks, and strategic risks – the present results indicate that disclosing more forward-looking operational risks helps drive down firm risk levels in a more effective way. This result is in line with previous literature that has suggested institutional investors place more value on individual firms' risks rather than on general market risks which every firm would face. In addition, more good news and the nature of the quantitative news that is disclosed will have greater effects on firms' risk reduction. These results therefore provide some support for the resource-based view (RBV) and quality signalling approach, which suggests that one way to improve the quality of firms' risk disclosure is by increasing the release of operational, good news and quantitative risk information: Such disclosures are less easily replicable by weaker competitors and transmit valuable, rare, inimitable and non-replicable risk management strategies information to potential investors.

The aim of this research has been to extend the empirical understanding of the usefulness of forward-looking risk disclosures in risk reduction. In adopting a content analysis approach, this research has some limitations. Subjectivity can be reduced with the aid of UNIX perl code scanning, but cannot be wholly eliminated, and the selection of risk categorisations is subject to debate. Nonetheless, this

method has proven to be effective in having facilitated important contributions to existing literature.

The originality of the cross-sectional exploration of forward-looking risk disclosures and its association with beta has opened up a vast scope for future risk disclosure studies. Sample companies could be selected from other countries, with comparative cross-country studies of particular value. When conducting other investigation in other countries, however, attention must be paid to legislation requirements, and accounting standards and cultural attitudes (as well as translation issues) that might have potential influence on firms' risk reporting practices (Aljifri and Hussainey, 2007). Research that investigates forward-looking risk information within specific industries might also bear considerable results. Admittedly, the nature of financial firms is significant different from that of non-financial firms; further work could be undertaken to examine whether the results of this study are replicated for financial institutions. Future research could also incorporate risk information from a variety of sources, and not exclusively rely on annual reports.

APPENDIX 3.1

Risk disclosure categories (Linsley and Shrives, 2006, pp. 401-402)

Financial risks	✧ Interest rate ✧ Exchange rate ✧ Commodity ✧ Liquidity ✧ Credit ✧ Inflation ✧ Taxation ✧ Market risk: changes in asset prices negotiated in the markets ✧ Derivative financial instrument ✧ Financial risks mitigation strategies
Operational risk	✧ Customer satisfaction ✧ Product development ✧ Product, project, service failure ✧ Efficiency and performance (Liability, Accounts receivable, cost structure, debt covenants, excessive debt, flexibility) ✧ Sourcing (purchasing materials) ✧ Stock obsolescence and shrinkage ✧ Environmental (risks stem from the impact of corporate operations on natural environment) ✧ Employment practices, health and safety ✧ Brand name erosion, reputation ✧ Research and development ✧ Intellectual property rights ✧ Management of growth (subsidiaries) ✧ Acquisitions, alliance, and joint-ventures ✧ Information systems and controls ✧ Management and employee fraud ✧ Operational risks mitigation strategies
Strategic risk	✧ Environmental scan (macro environmental sources: general economic conditions) ✧ Industry source (potential entrants, substitutes, suppliers, strategic partners, customers (e.g., changes in demand, changes in clients requirements and customers preferences) ✧ Business portfolio ✧ Competitors ✧ Pricing: freight rates and raw material, lower prices from competitors costs ✧ Valuation ✧ Planning ✧ Life cycle ✧ Performance measurement ✧ Regulator, legislation ✧ Sovereign, social and political ✧ Technological change ✧ Climate and catastrophic ✧ Strategic risks mitigation strategies
Internal control risk management strategies	

APPENDIX 3.2

Typical examples of risk disclosures

Company	Risk disclosure examples	Risk category	Sentence characteristics
G4S	"The security industry comprises a number of very competitive markets. In particular, manned security markets can be fragmented with relatively low economic barriers to entry and the group competes with a wide variety of operators of varying sizes. Actions taken by the group's competitors may place pressure upon its pricing, margins and profitability" (G4S, 2010, pp.50).	Strategic risk	Qualitative/bad news/forward-looking
Halfords Group	"The success of the Group's business depends upon its senior management closely supervising all aspects of its business, in particular the operation of its stores, autocentres and the design, procurement and allocation of its merchandise" (Halfords Group, 2010, pp.56).	Operational risk	Qualitative/neutral news/forward-looking
Hunting	"The oil price has recovered from its lows of 2009 and sustained an increase of 15% during 2010 and is now trending towards US $100/barrel, which has provided a stable and encouraging investment environment" (Hunting, 2010, pp.7)	Financial risk	Quantitative/good news/forward-looking
Halfords Group	"The Committee assists the Board in achieving its obligations under the Combined Code in areas of risk management and internal control, focusing particularly on compliance with legal requirements, accounting standards and the Listing Rules, and ensures that an effective system of internal financial and non-financial controls is maintained" (Halfords Group, 2010, pp.69)	Internal control risk management policies	Qualitative/neutral news/forward-looking

Descriptive statistics of variables 2012

	Mean (Median)	S.D.	Min (Max)	Skewness	Kurtosis
Forward-looking risk disclosure variables					
Total number of risk disclosures$_0$	119 (110)	65.76	26 (455)	1.873	8.352
Total number of risk disclosures$_1$	134 (122)	70.65	28 (480)	1.784	7.844
Number of financial risk disclosures	18(14)	13.76	0 (75)	1.404	5.115
Number of operational risk disclosures	56 (50)	33.70	7 (233)	1.916	8.950
Number of strategic risk disclosures	46 (38)	31.79	3 (199)	2.077	9.063
Number of good news disclosures	22 (18)	16.64	0 (102)	1.931	8.489
Number of bad news disclosures	38 (30)	33.63	3 (234)	2.856	13.018
Number of neutral news disclosures	58 (54)	31.27	6 (226)	1.286	6.585
Number of quantitative risk disclosures	8 (6)	7.39	0 (40)	1.567	5.910
Number of qualitative risk disclosures	111(100)	61.2	26 (417)	1.927	8.648
Other variables					
BETA$_{2012}$	1.05 (1.05)	0.31	0.49 (1.56)	-0.061	1.996
SIZE	14.46 (14.30)	1.42	12.36 (17.38)	0.493	2.407
POUT	34.97 (38.22)	21.08	0 (68.56)	-0.295	2.039
LIQU	1.55 (1.31)	1.01	0.46 (4.52)	1.585	5.088
GEAR	33.12 (30.98)	23.9	0 (82.22)	0.421	2.317
GROW	0.09 (0.06)	0.13	-0.09 (0.42)	1.049	3.658
ROCE	13.47 (11.87)	9.33	0.31 (35)	0.740	2.826
Observations	209	209	209	209	209

Note: due to missing variables data, the sample observations reduced to 209 for the year 2012. Forward-looking risk disclosure numbers and other variables except BETA$_{2012}$ are the data in 2010, BETA$_{2012}$ is the beta in 2012.

OLS Regression of the relationship between $BETA_{2012}$ and forward-looking risk disclosures$_{2010}$

$BETA_{2012}$	$Total_0$	$Total_1$	Financial risks	Operational risks	Strategic risk	Good news	Bad news	Neutral news	Quantitative risks	Qualititive risks
FRD	-0.00032	-0.00037	0.00071	-0.00077	-0.00051	-0.00384***	-0.00039	0.00059	-0.00824***	-0.00022
	(0.367)	(0.260)	(0.631)	(0.249)	(0.459)	(0.001)	(0.547)	(0.429)	(0.014)	(0.555)
POUT	-0.00287***	-0.00286***	-0.00284***	-0.00285***	-0.00286***	-0.00270***	-0.00287***	-0.00287***	-0.00282***	-0.00288***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
GROW	-0.30752*	-0.30479*	-0.30895*	-0.29331*	-0.31435*	-0.21814	-0.32055*	-0.31999*	-0.23025	-0.31135*
	(0.064)	(0.065)	(0.067)	(0.076)	(0.059)	(0.172)	(0.058)	(0.062)	(0.154)	(0.063)
SIZE	0.00392	0.00596	-0.00630	0.00378	0.00204	0.00433	0.00044	-0.01086	0.01454	0.00107
	(0.811)	(0.718)	(0.662)	(0.805)	(0.898)	(0.752)	(0.978)	(0.486)	(0.353)	(0.947)
LIQU	-0.02295	-0.02300	-0.02146	-0.02216	-0.02302	-0.02626	-0.02183*	-0.02066*	-0.01339	-0.02292*
	(0.345)	(0.345)	(0.370)	(0.367)	(0.342)	(0.292)	(0.367)	(0.378)	(0.597)	(0.342)
GEAR	-0.00171*	-0.00167*	-0.00182*	-0.00170*	-0.00176*	-0.00159*	-0.00172*	-0.00179*	-0.00126	-0.00174*
	(0.063)	(0.069)	(0.052)	(0.064)	(0.059)	(0.079)	(0.062)	(0.053)	(0.182)	(0.059)
ROCE	-0.00651***	-0.00650***	-0.00653***	-0.00649***	-0.00653***	-0.00648***	-0.00644***	-0.00641***	-0.00673***	-0.00651***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)
R^2 adjusted	0.3260	0.3277	0.3242	0.3281	0.3251	0.3580	0.3245	0.3254	0.3495	0.3245
Observations	209	209	209	209	209	209	209	209	209	209

Notes: Outliners in all regression variables are winsorised at the 5% level. FRD is forward-looking risk disclosures. Numbers in parentheses are p-values computed using heteroskedasticity consistent standard errors. ***, ** and * indicate significance at 1%, 5% and 10% level respectively. Industry dummies are included in all specifications but not reported in this results table. This table depicts the regression result of forward-looking risk disclosures$_{2010}$ and beta$_{2012}$ to test whether the forward-looking risk disclosures in 2010 have further impact on firm risk in further period. The total number of forward-looking risk disclosures doesn't show significant relationship, however, the good news and quantitative still reflect significant results. It implies forward-looking risk disclosures might have impact on risk reduction in two years ahead, although the effect is lower compared to the immediate future of year 2011.

APPENDIX 3.5

Descriptive statistics of past risk disclosures$_{2010}$

	Mean (Median)	S.D.	Min (Max)	Skewness	Kurtosis
Past risk disclosure variables					
Total number of risk disclosures$_0$	43 (35)	33.09	0 (212)	2.365	10.78
Total number of risk disclosures$_1$	44 (36)	33.33	1(212)	2.285	10.351
Number of financial risk disclosures	6(4)	6.89	0 (45)	2.196	9.259
Number of operational risk disclosures	22 (18)	20.12	0 (180)	3.380	21.949
Number of strategic risk disclosures	14 (10)	13.91	0 (116)	3.077	17.905
Number of good news disclosures	15 (12)	13.06	0 (91)	2.525	12.165
Number of bad news disclosures	15 (11)	15.96	0 (101)	2.68	11.914
Number of neutral news disclosures	13 (10)	10.34	0 (66)	2.053	9.270
Number of quantitative risk disclosures	20 (17)	19.64	0 (157)	3.465	19.691
Number of qualitative risk disclosures	22(18)	17.37	0 (104)	1.830	7.309
Observations	216	216	216	216	216

Note: the risk disclosures identified in the annual reports of 2010 are originally categorized according to time orientation into forward-looking risk disclosures and past risk disclosures.

OLS Regression of the relationship between $BETA_{2011}$ and past risk disclosures$_{2010}$

$BETA_{2011}$	$Total_0$	$Total_1$	Financial risks	Operational risks	Strategic risk	Good news	Bad news	Neutral news	Quantitative risks	Qualititive risks
PRD	0. 00052	0. 00046	0. 00182	0. 00043	0. 00114	0. 00292*	0. 00064	-0. 00147	0. 00128	0. 00009
	(0.413)	(0.467)	(0.473)	(0.671)	(0.335)	(0.087)	(0.614)	(0.407)	(0.156)	(0.939)
POUT	-0. 00231***	-0. 00231***	-0.00228***	-0. 00231***	-0. 00234***	-0. 00226***	-0. 00234***	-0. 00235***	-0. 00231***	-0. 00232***
	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)	(0.006)	(0.004)	(0.003)	(0.004)	(0.004)
GROW	-0. 26397*	-0. 26309*	-0. 25548*	-0. 27012*	-0. 24582	-0. 27185*	-0. 25014	-0. 23285	-0. 25808*	-0. 26133*
	(0.082)	(0.083)	(0.093)	(0.081)	(0.109)	(0.068)	(0.104)	(0.154)	(0.089)	(0.088)
SIZE	-0. 01463	-0. 01399	-0. 01176	-0. 01106	0. 01381	-0. 02026	-0. 01226	-0. 00610	-0. 01675	-0. 0093
	(0.309)	(0.331)	(0.375)	(0.410)	(0.323)	(0.140)	(0.397)	(0.645)	(0.236)	(0.498)
LIQU	-0. 03161*	-0. 03197*	-0.03236*	-0. 03235*	-0. 03223*	-0. 02999	-0. 03276*	-0. 03492*	-0. 03151	-0. 03292*
	(0.1)	(0.095)	(0.088)	(0.093)	(0.095)	(0.117)	(0.089)	(0.072)	(0.101)	(0.089)
GEAR	-0. 00174**	-0. 00175**	-0.00172**	-0. 00176**	-0. 00172**	-0. 00169**	-0. 00175**	-0. 00175**	-0. 00172**	-0. 00175**
	(0.042)	(0.042)	(0.046)	(0.041)	(0.044)	(0.049)	(0.042)	(0.043)	(0.045)	(0.042)
ROCE	-0. 00497***	-0. 00499***	-0.00506***	-0.00499***	-0. 00496***	-0. 00538***	-0. 00497***	-0. 00521***	-0. 00511***	-0. 0050***
	(0.008)	(0.008)	(0.007)	(0.008)	(0.009)	(0.005)	(0.008)	(0.007)	(0.006)	(0.009)
R^2 adjusted	0.259	0.2585	0.2583	0.2573	0.2591	0.27	0.2575	0.2587	0.2621	0.2567
Observations	216	216	216	216	216	216	216	216	216	216

Notes: Outliners in all regression variables are winsorised at the 5% level. PRD is past risk disclosures. Numbers in parentheses are p-values computed using heteroskedasticity consistent standard errors. ***, ** and * indicate significance at 1%, 5% and 10% level respectively. Industry dummies are included in all specifications but not reported in this results table. This table presents the regression results of past risk disclosures$_{2010}$ and beta$_{2011}$. This is to compare to the results of forward-looking risk disclosures. The total number of past disclosures do not show any significant relationship with beta, this provide support for the original hypothesis of this research that forward-looking risk disclosures are more valuable to investors in perceiving further firm risk level.

Chapter 4

Forward-looking risk disclosure, earnings quality and analyst forecast accuracy

4.1. Introduction

While the agency theory regarding the relationship between corporate insiders and outside stakeholders is well intensively investigated, one important aspect of managing the differing interests of agents and principals is the necessity to discipline managers' discretional behaviours through various monitoring mechanisms (Jensen and Meckling, 1976; Watts and Zimmerman, 1986). Financial analysis quality can be considered as one way to monitor whether the management of a firm breaches contractual links (Leftwich et al., 1981; Ball and Foster, 1982). Financial analysts represent the group to whom corporate reporting is (or should be) addressed. They are the primary users of financial statement information (Schipper, 1991). In gathering, processing, and distributing information to the market, they act as intermediaries between capital suppliers and firm management and therefore perform an important role in capital markets by reducing information asymmetries and agency problems between preparers and users of financial statements (Healy and

Palepu, 2001). Prior evidence suggests that analysts' share recommendations, price targets, earnings forecasts and written documents have value relevance to share price formation (Barker and Imam, 2008). One of the primary inputs in analysts' earnings forecast and valuation models is information risk, which generally refers to the odds of analysts' incorrectly specify share prices following poor quality disclosures. Theoretical studies propose that information risk is non-diversifiable (Easley and O'Hara, 2004), and is commonly proxied by disclosure level and earnings quality (Francis, et al., 2005; Hussainey and Mouselli, 2010).

Previous literature shows an intense interest in the impact of accounting information on stock returns (e.g., Mouselli et al., 2012; Francis et al., 2008). Built on the traditional Capital Asset Pricing Model (CAPM) framework, studies have tried to show that greater disclosure quantity lowers firms' cost of capital by reducing systematic risk. However, there is little research into the incremental ability of disclosures to anticipate future earnings. The few such works that address this are: Wang and Hussainey (2013), who present evidence that voluntarily publishing forward-looking information could improve capital market's ability to predict future earnings and these disclosures convey value relevant information for market participants; Dhaliwal et al. (2012), who focus on corporate social responsibility (CSR) disclosures, report that releasing stand-alone CSR reports leads to higher earnings forecast accuracy and suggest CSR disclosures complement firm's financial disclosures; and Dorestani and Rezaee (2011), who document that the change in key performance indicator (KPI) disclosures is related to lower analyst forecast error. This strand of disclosure research centres on voluntary non-financial information, which, they argue, would impact firm value and thus indirectly lead to higher forecast accuracy. However, to the best of my knowledge, no attempts in literature

have examined risk disclosures, especially forward-looking risk disclosures (*FRD*), which contain both valuable financial and non-financial information context and its potential value to lower forecast error within British context. I extend these studies by focusing specifically on forward-looking risk disclosures that have not been investigated in existing literature and predict a significant positive relationship between the extent of *FRD* disclosures and analyst forecast accuracy. I use a coded index to count *FRD* in the narrative sections of annual reports and provide evidence that *FRD* effectively lowers forecast error, with this effect appearing strongest over a short-term forecast horizon. My detailed risk construction also confirms the association identified for aggregate risk disclosures.

Financial transparency (or opaqueness) is widely assessed by earning quality, which is commonly included as an explanatory variable in the modelling of earnings predictability. By definition, earnings quality refers to "the precision of the earnings signal emanating from the firm's financial reporting system. Such imprecision affects the capital market's demand for, as well as a firm's motive to supply, disclosures that are useful to current shareholders and prospective investors in assessing firm value" (Francis et al., 2008, pp.54). Prior literature examining analysts' perceptions of earnings has focused on individual earnings attributes - for example, earnings persistence, variability, volatility, or transitory items (e.g., Francis et al., 2004; Dichev and Tang, 2009); or within a market-based accounting context, looked at accruals quality on cost of capital. However, few attempts have used alternative earnings quality metrics to quantify earnings quality and test its potential usefulness on lowering forecast error. The current research extends the earnings quality literature and hypothesizes a significant negative association between forecast accuracy and earnings quality; since all my *EQ* metrics are inverse measure of

earnings quality, I predict positive sign of *EQ* in all my regressions. I use five *EQ* metrics: 'accruals quality', 'absolute value of abnormal accruals', 'earnings variability', 'common factor score' for three underlying accruals estimates, and 'discretionary revenues'. The results support my hypothesis and are robust when I change alternative *EQ* metrics and control for various potentially confounding factors. Further, I report *EQ* has a long-term predictive power of earnings and the earnings predictability declines when the forecast horizons increase.

I also extend the earnings forecast literature by supporting the complementary and simultaneous impact of *FRD* and *EQ* on forecast accuracy. My findings are relevant, to the extent that investors incorporate analysts' earnings forecasts in their portfolio investment and respond to revisions of those forecasts, my results provide insights into understanding what role information risk plays in investors' decision-making.

The remainder of this thesis is structured as follows. Section 4.2 discusses related research and hypothesis development. Section 4.3 discusses model specifications. Section 4.4 explains sample selection and data collection. Section 4.5 presents the main results. Section 4.6 is the conclusion.

4.2. Literature review and hypothesis development

4.2.1. Theoretical development

Stakeholder-agency theory, originally proposed by Hill and Jones (1992), is used to explain the nature of the implicit and explicit contractual relationships that exist between a company's stakeholders. In a wide context, a company's stakeholders

encompass all resource holders; not only managers and large stockholders, but also customers, suppliers, creditors, employees, local communities and the general public.

According to a broad definition of stakeholders, financial analysts act as intermediaries between investors and company managers and play an essential role in internal and external contractual links. Financial analysts provide professional services of earnings anticipations, buy/sell recommendations and other investment advice to various financial entities. Firms' disclosure quantity is a determinant of analyst following, since much of the information that analysts use in their evaluation is sourced directly from firms (Lang and Lundholm, 1996). In an investor relations perspective, if it is less expensive to acquire information from inside the firm than to obtain it from other sources, greater information quantity will improve analysts' services. The effect of voluntary disclosures on clients' request for analysts' services highly relies on the character that analysts perform in the financial market. The main information stream flows from inside the company to financial analysts, who evaluate the information and communicate it to the financial market; therefore increased firm-provided information means analysts have more valuable reports to sell. In light of this, greater information quantity is attributed to a more accurate earnings forecast, thereafter increasing the aggregate demand for analyst services. Thus, firms have an incentive to increase analysts' followings by voluntarily releasing more information, as the market evaluation of the stock prices will be closer to their intrinsic value, and investors will be more positive towards further increases by high-disclosing firms. In accordance with this, the analyst community is consistently in favour of more voluntary disclosures, relative to financial transparency and non-financial disclosures.

In addition, the extent of disclosure is also likely to affect analysts' forecast

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characteristics. In more specific terms, firms that voluntarily release more verifiable forward-looking risk information and earnings related financial information will typically find a greater consensus among analysts' earnings forecasts (i.e., lower forecast standard deviation), more accurate forecasts and less variable forecast revisions. This is because analysts hold both firm-provided and privately-obtained information, but the increase in disclosures and timeliness decreases the weight analysts put on other information sources in building up their forecasting models, which "smooths the forecast revision process by expediting the resolution of uncertainty" (Lang and Lundholm, 1996, pp.490).

To the extent that analysts may be considered as representing or influencing investors' beliefs, high-disclosing firms may have a larger cluster of potential investors and less dispersion in investors' beliefs about performance. In addition, investors' expectations about future earnings fluctuate more smoothly over the year.

4.2.2. Direct impact of increased forward-looking narratives on earnings anticipation

Previous studies of the usefulness of forward-looking narratives to analysts' forecast accuracy, if put in chronological order, include: Bryan (1997), who initiatively examines the disclosure content in 'Management Discussion and Analysis (MD&A)' sections within annual reports that are compelled by the U.S. Securities Exchange Commission (SEC), and reports a significant positive association between forward-looking operational disclosures and one-period ahead changes in earnings per share, but he fails to observe a long-term association. Following Bryan (1997), Schleicher and Walker (1999) use a self-construct future-oriented index and manually code the

information on firm's trends and uncertainties that are likely to prevail in future. They support the usefulness of voluntary forward-looking disclosures in anticipating future earnings changes. Further, they show this effect is strongest in tests that study one-period-ahead and two-period-ahead stock price forecasts[14]. Their findings imply that up to one third of future earnings movements are anticipated and valued by the financial market according to the voluntarily released forward-looking narrative predictions. Later, Hussainey et al. (2003) embraced a standard text investigation-programming bundle to evaluate forward-looking disclosures in narrative section among all his annual report studied. Using Collins et al.'s (1994) returns-future earnings regression model and they find high disclosing firms generate higher future earnings response coefficients. Their finding implies that corporate current returns are strongly associated with future earnings movements.

Several studies have suggested that the effect of forward-looking disclosures on next period's earnings prediction is conditioned on particular contextual factors. Schleicher et al. (2007, pp.153-154) present evidence that this relationship is conditioned on a firm's profitability, and the association is more significant for low-profit (loss-making) companies. They provide two reasons to explain why forward-looking disclosures are important source of information in poor years. Firstly, "loss cannot prevail indefinitely in surviving firms; the existence of a loss in such firms unambiguously indicates that current income is not a good guide to the longer-term earnings power of the firm, compared with profits that are sustainable in the long-run"; secondly, a reported loss indicates that the market cannot price the firm according to reported earnings (e.g. P/E models) as such a valuation approach would infer a negative share price. Therefore, in order to make accurate earnings forecasts,

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[14] Schleicher and Walker (1999) find the effect of forward-looking disclosures on earnings predictability is minimal for three-period-ahead, four-period-ahead and five-period-ahead.

analysts require additional information that clarifies the possible reasons for reported losses and how long the losses are possibly sustain to assess the firm's long-term profit-generating capacity. Hussainey and Walker (2009) extend the literature by taking into account firm growth characteristics. They report that the level of forward-looking disclosures is significantly associated with improved earnings predictability for high-growth firms. Based on the argument of the accounting failure to capture the value-relevance of intangible investments on a timely basis mean that high growth and intangible asset intensity will diminish the predictive power of current earnings with regard to future earnings numbers. Investors, targeting high-growth companies realize that current earnings provide a poor indicator to estimate firm's future earnings, and will tend to obtain more timely information from other sources, i.e., forward-looking disclosures relevant to earnings. A recent study by Wang and Hussainey (2013) investigates corporate governance characteristics on forward-looking disclosures and whether they are informative about future earnings. They adopt the computerized content analysis method developed by Hussainey et al. (2003) to quantify voluntary forward-looking disclosures, and also use the modified returns-future earnings model (Collins et al., 1994) to calculate earnings response coefficients. They find good corporate governance mechanisms could improve forward-looking disclosures, which augment stock market's anticipation of a firm's future earnings.

In addition to extensive evidence regarding the value relevance of forward-looking disclosures to earnings forecasts accuracy, some researchers have investigated other sorts of voluntary narratives and report similar conclusions. Dhaliwal et al. (2012) inspect the association between the disclosure level of Corporate Social Responsibility (CSR) and earning forecast accuracy using firm-

level data collected from 31 countries. They find that the release of CSR could greatly reduce analyst forecast error. This association appears stronger for firms with more opaque financial disclosures, supporting the complimentary relationship between CSR disclosures and financial disclosures. Dorestani and Rezaee (2011) focus on the impact of degree change in KPI[15] disclosures and earnings forest error. By deflating the absolute value of forecast errors by stock price, they provide evidence that greater changes in non-financial KPI disclosures reduce analyst forecast error.

4.2.3. Impact of increased level of FRD on firm value

Forward-looking risk disclosure is a valuable component in analysts' earnings prediction in view of its potential impact on a firm's value. Previous literature find firms with high quality *FRD* enjoy benefits in the capital market. The information asymmetry between corporate insiders and outsiders gives rise to the classic agency problem. Theoretical researches support a negative relationship between the level of disclosure and cost of capital. One strand of research indicates that a higher level of disclosure accelerates stock market liquidity and in sequence decreases firms' cost of capital either through reduced transitions costs or by increased demand for the target firm's stocks. The reasons behind this argument are: voluntary disclosures make the acquisition of costly inside information unnecessary; disclosures reduce the level of information revealed by a large transaction, and decrease the adverse price effect of large trades; when inside information is more extensively distributed, it is impounded into more precise share price (Diamond and Verrecchia, 1991; Amihud

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[15] The purpose of KPI is to enhance the transparency and value relevance of public financial information.

and Mendelson, 1986). All these benefits motivate investors to acquire more share holdings and drive up the market demand and share price, result in a lower cost of capital. Another strand of research states that greater disclosures reduce investors' estimation risk due to their uncertainty about the parameters of a security's return or pay-off distribution. Since investors' estimates depend on accessible information, their confidence level builds on the quantity of the information. Greater uncertainty exists regarding the true parameters in low disclosing circumstance (Botosan, 2006). There is considerable empirical evidence regarding how disclosures manifest in the cost of capital. The main stream of literature report a significantly negative relationship between information level and a firm's cost of capital (e.g. Francis et al., 2008; Hughes et al., 2007; Easley and O'Hara, 2004; and O'Hara, 2003). The reason behind is uninformed investors recognize their information disadvantage and reduce their shareholdings in such firms accordingly, which inevitably knocks down the stock price. If the estimation risk is non-diversifiable, uninformed investors would require additional compensation for bearing higher risk, which increase the cost of capital.

Some studies find firm values may vary when disclosures impact on firm risk. In a widely referenced paper, Lambert et al. (2007) support the relationship between information quality and firm's systematic risk. Ng (2011) reports a firm's liquidity risk reduces as its disclosure credibility increases. The intuition behind this link is that all firms face systematic risk; firms of higher market risk presumably have poorer performance during market downturn, but perform relatively better in stable and prosperous market. Liquidity risk, as one form, of systematic risk, is a sensitivity factor; the relevant macroeconomic factor is market liquidity. When market liquidity deteriorates, all sorts of shares will experience different degrees of investors outflow.

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This outflow may be worse for firms with lower information quality, considering the squeezes on investors' demand for those shares with higher uncertainty and adverse selection. Market makers may also be less willingly to buy those firms' shares as a result of the concerns of adverse selection, which sequentially could further restrain investors' demand for those shares. Overall, the scope of disclosure greatly impact firm's risk.

Some studies discuss the potential economic benefits of disclosures in view of firm performance. Greater disclosures smooth the agency problems. The greater in depth communication between management and market investors reduces mis-valuation and managerial myopia due to asymmetric information and short-run market pressures. According to the statement of the treasurer of Progressive Direct Insurance Co., by voluntarily increasing the frequency of financial disclosure, their company's stock volatility reduced by as much as 50% from 2001 to 2004 (Graham, 2004). Another view states that disclosure leads to better monitoring, which in turn leads to better firm performance. They argue that disclosure is an effective monitoring tool for managerial decisions (Hope and Thomas, 2008). Higher extent of disclosures allow external stakeholders, including institutional investors and financial analysts, to form their own judgment on management decisions and impose pressure on managers to make relevant decisions (Bebchuk and Fried, 2005).

Overall, both theoretical and empirical literature reveals that analysts can obtain useful information from voluntary disclosures to anticipate a firm's future earnings. Forward-looking risk disclosures, as a key example of corporate voluntary narratives, comprise both earnings-sensitive financial information and operational and strategic risk information that have the potential to impact on firm's value. I then expect to find a significant negative association between *FRD* and earnings forecast

error (*FCERROR*). Based on previous empirical evidence (i.e. Bryan, 1997; Schleicher and Walker; 1999), I expect the effect of *FRD* on earnings predictability to be relevant in short-term, i.e., for a one-year or two-year forecast horizon. Therefore I have the first hypothesis:

H₁: There is a negative association between forward-looking risk disclosure quantity and analyst forecast error.

4.2.4. The association between earnings quality and forward-looking risk disclosure

Another widely used proxy for information risk is earnings quality (*EQ*). Some scholars investigate the association between disclosure quantity and earnings quality and examine whether there are complimentary or substitutive relationship between the two variables when explaining stock returns, cost of capital, and earnings forecasts (e.g., Francis et al., 2008; Mouselli et al., 2012; Dhaliwal et al., 2012).

Francis et al.'s (2008) research endorses a complementary relationship between disclosures and earnings quality, indicating that companies of higher earnings quality exhibit more extensive disclosure content. However, they also find that if unconditional on earnings quality, the reducing effect of disclosure narratives on a firm's cost of capital is significantly reduced or disappears completely if earnings quality is included as an explanatory variable. Similar conclusions can be found in Dhaliwal et al. (2012), who indicate the complementary feature of non-financial disclosures to financial disclosures to improve earnings predictability. They use the

average scaled accruals to control earnings quality[16] and argue that both financial and non-financial disclosures contain information relative to firm value; for firms of lower earnings quality, analysts can obtain more useful insights from non-financial disclosures to anticipate corporate future earnings.

Both studies suggest the inclusion of earnings quality as a main control variable in explaining the relationship between disclosures and analyst forecast accuracy. However, analytical research suggests conflicting predictions on the association between the extent of disclosure narratives and earnings quality. Theoretical studies (e.g. Dye, 1985; Richarson, 2000) suggest a negative relationship between earnings quality and firm's information level, this was supported by extensive empirical evidence (i.e., Lang and Lundholm, 1996; Welker, 1995; Glosten and Milgrom, 1985). It is suggested that the information asymmetry problem between corporate inside management and external investors increases investors' demand for greater disclosures and motivates managers to voluntarily release more information, as the value of incremental disclosures is higher in this condition (Grossman and Hart, 1980; Milgrom, 1981). The implication is that firms with a low (high) earnings quality will release more (less) disclosures because information asymmetry is higher (lower) in those firms; this implies a substitutive relation. Conversely, another view argues that firms are less intended to issue proprietary information when the earnings quality shows a declining tendency (Dye, 1985; Jung and Kwon, 1988) Firms with low (high) earnings quality release less (more) information, since the credibility of such disclosures is questionable among professional users; this implies a complementary relation. I assume there is an interactive relation between *FRD* and *EQ*, with an unclear predicted sign. It is

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[16] Earnings quality is interchangeable to "financial opaqueness" in Dhaliwal et al. (2012).

important to investigate how earnings quality interacts with voluntary forward-looking risk disclosures in the forecasting process, but this is not the main focus of the present research.

4.2.5. The relationship between earnings quality and analysts forecast Accuracy

Aboody et al. (2005) provide several reasons to explain why earnings quality can be viewed as a suitable proxy for information risk: information risk is a priced risk factor (Francis et al., 2005); relative to the cash flow component of earnings, the earnings accruals are much easier to be manipulated by managers, implying little proprietary information may be pre-empted by earnings announcement; earnings quality is an omnipresent construct that applies to different listed firms; unlike using trade data to indirectly measure corporate information risk, earnings quality directly reflects corporate information setting using the reported financial data in annual reports.

Earnings quality and disclosure quantity are the two commonly used proxies of information risk and share many common characteristics. Earnings are viewed as one of the main inputs in analysts' forecasting process and valuation models. Earnings of higher quality are more predictable and suitable to forecast. Francis et al. (2008) apply three predictive factors — higher persistence, less transient, and lower volatility — to indicate earnings quality. Following their method, I then discuss the link between these three attributes and earnings quality respectively.

In view of earnings persistence, Dechow and Dichev (2002) state that one beneficial role of accruals is to adjust mis-matched cash flows to better mirror a

firm's performance. However, accruals are commonly calculated on assumptions and estimates, so if inputs are incorrect, accruals must be adjusted in future financial statements. For instance, "if the net proceeds from a receivable are less than the original estimate, then the subsequent entry records both the cash collected and the correction of the estimation error" (Dechow and Dichev, 2002, pp.36), which means the benefit of accruals would reduce due to estimation errors and their subsequent corrections. Large magnitudes of estimation errors in accruals signify lower earnings quality and earnings predictability, which indicates a positive impact of earnings persistence on earnings quality.

Ali and Zarowin (1992) argue that, in the presence of transitory components of earnings, using previous earnings to estimate current earnings may not be appropriate. In addition, using earnings changes in previous period to indicate unexpected earnings may understate earnings' effects because it is based on the assumption of permanent shocks to earnings. Further, the estimation errors in earnings are negatively correlated with earnings persistence, which causes the subsequent examination of the relation between earnings response coefficients and persistence to be overstated. Their findings suggest the transitory nature of earnings, hence their limited predictive power.

Earnings volatility arises from two issues: economic shocks and accounting problems in reporting earnings. Both issues drive down earnings predictability. Graham et al.'s (2005) survey reveals a broadly belief that earnings volatility has a negative impact on earnings predictability. Of the 401 financial executive respondents, 97% express a prominent preference for earnings smoothness (or strong aversion to volatile earnings). In exploring the reasons for this feedback, 80% of executive respondents express their opinion that earnings are less predictable under

higher volatility. Stemming from the survey evidence, Dichev and Tang (2009) consider the specific mechanisms that link earnings volatility to the predictability to be related to accounting and economic issues. In view of economic shocks, earnings volatility reflects the impact of genuine and unavoidable economic instability. Instinctively, firms that endure hefty economic shocks tend to cause lower predictable and higher volatile earnings. In addition, accounting problems in reporting earnings, such as, poor matching of expenses to revenues, increase the noise in long-term forecast horizon, and subsequently drive up earnings volatility.

In addition to the intuitive predictive power of earnings, scholars also provide evidence about how earnings quality affects firm value through various channels. In Dechow et al.'s (2010) review of the consequences of earnings quality, they list: (1) litigation risk, (2) audit resignations, (3) market valuations, (4) real activities, (5) analyst forecast accuracy. The question how earnings directly affect analyst forecast accuracy has been well discussed, in the following session, I will focus on the other consequences. Palmrose et al. (2004) demonstrate that the change of previous reported earnings in restatements increases the probability that shareholders will win in litigation, which, in other words, lifts up firms' litigation risk. In addition, studies set in high-risk contexts (e.g., IPOs); where abnormal accruals are likely to signify misstatements beyond the boundaries of GAAP, also find a negative impact of earnings quality on a firm's litigation risk (Ducharme et al., 2004; Gong et al., 2008). From an audit opinions perspective, earnings quality has significant implications for the auditor-client relationship. Huang and Scholz (2012) find that a restatement greatly increases the likelihood of auditor resignation. Moreover, companies with severe restatements are prone to hire smaller auditors after a resignation. Auditors treat restatements as an indication of increased client risk. In view of market

valuations, when firms fail to meet earnings targets, they are likely to lose high market valuations immediately (Myers et al., 2007). When extreme earnings management and fraud are detected, firms will suffer substantial losses in the capital markets, not least reputational penalties for misstatement (Karpoff et al., 2008). In respect of real decisions, Biddle and Hilary (2006) and Biddle et al. (2009) both state that external investors are less misguided by asymmetric information with the help of high quality accounting and hence result in high level of investment efficiency. Others review that earnings quality, endogenously determined by accounting decisions, also affects managers' internal investment decisions (Jackson et al., 2009) and misstatements distort investment decisions (McNichols and Stubben, 2008).

I embrace five separate earning quality measurements with an aim to confine the essential components of earning that have been repetitively examined in previous literature, for instance 'cash flows', 'earnings variability and persistence' to ensure the results are not influenced by choosing alternative earnings quality metrics. Based on existing work, I expect to find a negative association between earnings quality and analyst forecast error. Therefore, I state the second hypothesis as:

H_2: Earnings quality is negatively associated with analyst forecasts error.

4.2.6. Additional discussion on the long-term predictive power of earnings quality

Using analyst forecast accuracy to estimate earnings quality is imperfect. It entirely depends on the presumption that analysts are impartial with expertise in earnings prediction. Empirical studies challenge the validity of this assumption. There is evidence that when rational analysts detect earnings manipulation, they include the

inferences of discretionary accruals into earnings anticipation, and will discount earnings per share accordingly (Coles et al., 2006; Burgstabler and Eames, 2003). On the contrary, Abarbanell and Lehavy (2003) and Bradshaw et al. (2001) argue that although analysts understand the implications of accruals in earnings forecast, manifested by their investment advices, their forecasts are not complete impartial.

The present research assumes the impartiality and expertise of financial analysts in view of earnings prediction, therefore the deviation of analysts' forecasts echoes the features of earnings relevant to earnings quality only. A stream of returns-based research measure earnings quality by market returns, these research suffer from the limitation that they depend on the presumption of market efficiency; whereas the inferences of earnings quality in my tests are subject only to the assumption of analyst efficiency. Using analyst forecast accuracy to estimate earnings quality has the benefits that it only incorporates earning attributes whereas market prices embroil more information than just earning and may mislead researchers regarding the usefulness of earnings quality.

Analysts' efficiency is a controversial issue. Managerial manipulation of earnings can inflate reported sales prematurely or understate liabilities. As analysts fixate on recorded bottom-line proceeds, they can be temporarily deceived. There is evidence that analysts cannot unwind the implication of reported earnings in a timely fashion (Dichev and Tang, 2009). It can be explained by that earnings attributes imply indications about a firm's financial performance, however analysts have a slow reaction to this information. For example, accruals contain information regarding changes in inventories, accounts receivables and payables, and factors commonly included in analysts' evaluation of a firm's business conditions. A firm that experiences sales difficulties or issues regarding production will find a heavy

accumulation of inventories. Likewise, sales failures and tighter credit will result in an increase of payables. Where companies of high accruals are not necessarily facing financial distress, the components of accruals predict a slow sales growth, albeit analysts' fixated income appears healthy. Plenty of empirical evidence supports the notion of a delayed or under reaction of the market to the accounting information in financial statements (i.e. Bernard and Thomas, 1989; Abarbanell and Bushee, 1998). In particular, accruals increase in response to a market decline or a slowdown in a firm's business conditions; however, the market does not ravel this signal instantly. Accordingly, accruals subsequently result in negative stock returns. This under reaction of the market has also been developed in behavioural finance that suggest individuals extrapolate past trends from short histories too far into the future (Shleifer, 2000) and reacts slowly when new signs come into being. Analysts are some of the most important market participants: their response to contained information in earnings can be expected to reflect similar features of the market.

I assume that if analysts are fully aware of this phenomenon, then their earnings forecasts for the adjacent current period in response to the short histories of earnings entries may be a delayed reaction. However, when forecast horizon increases, the market fully reflects the published components of earnings and analysts are more confident in earnings anticipation. So, I expect the predictive power of earnings quality will experience a slight increase in the short-term and remain constant in long-term forecast horizons (i.e. up to three-year-ahead forecast horizons).

4.3. Measurement of main variables

The main variables in the present research are analyst forecast accuracy, forward-looking risk disclosures, and earnings quality. I discuss in the following section how each of the variables is measured.

4.3.1. Analyst forecast accuracy

Consistent with prior studies (Dhaliwal et al., 2012; Dorestani and Rezaee, 2011), I use analyst forecast error (*FCERROR*) as an inverse measure of analyst forecast accuracy. I measure forecast error by the absolute value of the difference between the actual earnings per share (*EPS*) and mean forecast earnings per share (*MFC*), deflated by the absolute value of actual earnings[17] (*EPS*):

$$FCERROR \ (Y) = \left| EPS_{j,t}^{Y} - MFC_{j,t}^{Y} \right| / EPS_{j,t}^{Y} \qquad (4.1)$$

where subscript *j* represents firm *j*, and *t* for year *t*. Indicator *Y* takes three values, 0, 1, or 2, to indicate the mean forecast and actual earnings are for one-year-ahead, two-year-ahead and three-year-ahead. In my sample, *FCERROR (0)*, *FCERROR (1)* and *FCERROR (2)* denote forecast error in firm-year 2011, 2012 and 2013 respectively. I follow Dhaliwal et al.'s (2012) approach to distinguish among forecasts made for different years as there is evidence that analysts' forecast accuracy diminishes when the forecast horizon increases (De Bondt and Thaler, 1990). The forecast horizon is limited to three years, considering that analysts do not usually conduct forecasts beyond this, and forecasts for longer time horizons become less reliable and the sample size reduces dramatically for longer period forecasts.

MFC is the average value of all earnings forecasts for a company derived by

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[17] I obtain similar results when I use the stock price at the beginning of the fiscal year as the deflator.

the majority of contributing analysts[18]. It is a composite forecast of earnings per share that distils all available current *EPS* estimate data for the specified fiscal time period into a single expectation[19]. The average *EPS* estimate, commonly known as the 'consensus forecast', is calculated by adding the current *EPS* estimate data for the specified fiscal time period from all contributing firms and dividing this figure by the number of *EPS* estimates that enter into the calculation[20]. *EPS* is the actual earnings per share; both *MFC* and *EPS* data are obtained from the *I/B/E/S* database to ensure consistency. Detailed explanations of the computation of variables and codes used to search in I/B/E/S and DataStream are presented in Appendix 4.1.

I use deflated earnings forecast errors in order to correct for error variance. It is argued that deflated *FCERROR* corrects for heteroscedasticity and non-normality and the explanatory powers of regressions clearly improve (e.g., Dorestani and Rezaee, 2011; Hodgkinson, 2001; Horrigan, 1983).

4.3.2. Level of forward-looking risk disclosures

I stick to the forward-looking risk disclosures (*FRD*) data manually collected from the narrative sections in annual reports I have used in Chapter 2 (pp.61) and 3 (pp.115). To avoid repetition, I briefly introduce how the quantity of *FRD* is measured.

Before conducting any risk disclosure studies, the first step is to define risk. I embrace a broad definition of risk, which incorporates both positive opportunities

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[18] Following Dorestani and Rezaee's (2011) approach, I replace the mean analyst forecast *EPS* by median analyst forecast *EPS* to calculate *FCERROR§;* the results are robust (see Table 4.6).
[19] This definition is originally from *DataStream*.
[20] This definition is originally from *DataStream*.

and negative uncertainties (e.g., Cabedo and Tirado, 2004; Linsley and Shrives, 2005, 2006). In particular, a sentence is coded as risk-related if it specifies any 'opportunity' or 'prospect', or any 'hazard, threat or exposure' information, which has the potential to influence a firm's value, a statement of a firm's risk mitigation and opportunity seizing strategies, or internal control risk management policies (Cabedo and Tirado, 2004). The second step is to define forward-looking risk disclosure. Forward-looking risk disclosures (*FRD*) include any risk-related information that informs readers about future potential opportunities or threats and uncertainties arising from the interaction of external macro-economic and market risks and internal operational risks, and about any descriptive information regarding internal control risk management policies.

I adopt and develop Kravet and Muslu's (2013) UNIX perl code to identify forward-looking risk disclosures in all narrative sections in annual reports. I choose sentence as a basic counting unit rather than word, phrase, page or number of lines (Rajab and Handley-Schachler, 2009). A sentence is tagged as *FRD* if it contains at least one keyword that connotes risk. The keywords that I use to search *FRD* sentences with computer automated text recognition software include (a (*) indicates that suffixes are allowed): can, cannot, could, may, might, risk(*), uncertain(*), likely to, subject to, potential(*), vary(*), varies, depend(*), expos(*), fluctuat(*), possibl(*), susceptible, affect, influenc(*), and hedg(*), opportunit*, prospect, expect, impact, and outlook. In view of the boiler plate words problem (Linsley and Shrives, 2006; Abraham and Cox, 2007), I then manually examine all tagged risk-related sentences to filter the ones that contain the boiler word but do not contain risk information. The combination of software search and manual content analysis greatly decrease the subjectivity problem in manual content analysis; it improves the

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effectiveness of computer-based content analysis. Finally, I count the total number of sentences that include at least one listed keyword and are genuinely risk-related to decide the level of a firm's forward-looking risk disclosures.

In order to test the effect of different categories of *FRD* on analysts' forecast accuracy, I follow previous literature (e.g., Linsley and Shrives, 2006; Oliveira et al., 2011) in categorizing the identified *FRD* sentences into several groups. By business focus, I categorise total *FRD* into financial risk, operational risk, and strategic risk. Financial risks associate with firms' financing issues, which have an immediate effect on corporate assets and liabilities of a monetary nature. It contains financial factors: commodity risk, taxation, inflation, market risk, interest rate, exchange rate, liquidity, credit, financial derivatives, and the description of firms' financial risk mitigation strategies. Operational risks are those which firms are willing to pursue with the aim to achieve competitive advantages and enhance shareholders' wealth. These risks directly impact the daily operation of the business and are assumed to be under the control of company managers. Operational risks include: "customer satisfaction, product development, product, project, service failure, operational performance and efficiency, materials sourcing, stock obsolescence and shrinkage, information systems and controls, research and development, environmental impact, employment practices, health and safety, management and employee fraud, brand name erosion, reputation, intellectual property rights, firm growth, acquisitions, alliance and joint-ventures" (Linsley and Shrives, 2006, pp. 401), and the description of operational risk mitigation strategies. Strategic risks are macroeconomic or general social environmental factors that might impact firms' operations. These are generally beyond organizational control. Strategic risks include: "environmental conditions, industry source, business portfolio, competitors, pricing, valuation,

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planning, life cycle, performance measurement, regulator, legislation, sovereign, social and political, technological change, climate and catastrophic" (Linsley and Shrives, 2006, pp. 401-402), and the descriptions of strategic risk mitigation strategies.

4.3.3. Earning quality metrics

4.3.3.1. Risk disclosure studies

Before proceeding to earnings quality measures, it is first necessary to explain earnings management. Earnings management is defined as applying accounting techniques to produce a financial report that draws an excessively positive picture of a firm's operation and financial status (Dechow et al., 2012). Earnings management takes advantage of accounting rules and are legitimately flexible when companies recognize revenues and expenses. It is often hard to distinguish acceptable approaches from misrepresentations. Earnings management encompasses this grey area; however, it frequently relates to earnings fraud.

Firms use earnings management to even out earnings fluctuation or to meet investors' earnings expectations. Large earnings fluctuations can be normal in a firm's operation, but tremendous movement may trigger investors' vigilance, especially for stable and growing firms. Some managers use accounting gimmicks to meet analysts' expectations, especially if their firm's share prices fall after earnings announcements (Dechow et al., 2012).

4.3.3.2. Definition of Accruals

'Accruals' is defined as "accounts on a balance sheet that represent non-cash-based assets and liabilities applied in accrual-based accounting. These accounts include accounts receivable, accounts payable, goodwill, deferred tax liability and future interest expenses" (Bhimani et al., 2008, pp.59). Accrual-based accounting "assesses the performance and position of a firm by recognizing economic events regardless of when cash transactions occur. It embraces the matching principal by matching revenues to expenses at the time the transaction occurs, rather than when payment is made or received. This approach allows current cash inflows/outflows to be combined with future expected cash inflows/outflows in order to draw a more precise picture of a company's current financial condition" (Bhimani et al., 2008, pp.59). However, relative complexity and uncertainty about the timing and volume of future earnings and expenditures make this a controversial issue in accounting research. A distinct and significant research area has been focused on distinguishing the two types of accruals from non-discretionary to discretionary accruals by modelling the accrual process[21]. Non-discretionary accruals ought to recognise amendments that indicate a firm's fundamental performance, comparatively discretionary accruals ought to detect earnings distortion caused by mis-specification of the accounting principles or management earnings manipulation, as a result of the lack of effective measurement framework. The documented metrics endeavour to locate problems directly from inside the measurement framework thus are particularly pertinent to academics. The underlying argument relies on the assumption that if the non-discretionary element out of total accruals is modelled correctly, the rest discretionary element should reflect the earnings distortion.

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[21] 'Discretionary accruals' is interchangeable with 'abnormal accruals'; 'non-discretionary accruals' is interchangeable with 'normal accruals'.

I adopt four accrual models: the standard deviation of cash residuals (EQ^1), the average estimate of absolute abnormal accruals (EQ^2), the standard deviation of earnings per share (EQ^3). In addition, following Francis et al. (2008) and Bhattacharya et al. (2011), I use the common factor score obtained from the above three underlying proxies as a combined measure of earnings quality (EQ^4). Prior literature suggest various measures of earnings quality, but have reached no agreement on a perfect metric for detecting earnings management. I adopt these proxies because they have been widely used in previous research and have been found to have roughly the same impact on lowering the cost of capital (Francis et al., 2005).

It need be pointed out that when accessing these models, the estimates of discretionary accruals computed from models tend to have a positive relationship with the total level of accruals. This indicates firms with extreme total accruals are also liable to exhibit greater discretionary accruals. This perception is critical when clarifying results. It brings concerns about whether discretionary accruals detect earnings management or whether they are instead caused by poorly specified accrual models (Dechow et al., 2010). Keeping this in mind, the aim is to test the consistency and generalizability of the results. I embrace five *EQ* models to ensure that the conclusions will not be affected by the choice of metrics to estimate *EQ*.

4.3.3.3. Earnings Quality Metrics

The first proxy of earnings quality adopted in the current research is the standard deviation of cash residuals (EQ^1). Dechow and Dichev (2002) construct the model to capture the scale of estimation errors in accruals, based on the relationship between

accruals and cash flows. The basic notion is the accounting mismatch causes a gap between the amount of accrued earnings and the amount of realized earnings. This commonly refers to estimation errors. Dechow and Dichev (2002) separate accruals by regressing working capital accruals on cash flows in present, adjacent past and future time period, changes in revenues and property, plant and equipment (PPE). The unexplained component of the variance of working capital accruals is an inverse proxy of earnings quality, i.e. a higher unexplained component indicates lower earnings quality.

Dechow and Dichev's (2002) model focuses on short-term working capital accruals and their association with cash flows, but is not an attempt to map long-term accruals into cash flow realizations. "The R^2s from their specification are higher compared with those of the modified Jones' (1991) model: 47% at firm level, 34% at industry level, and 29% at pooled level" (Dechow et al., 2010, pp.359). Using this metric to proxy earnings quality, they find firms with higher standard deviations of cash residuals tend to exhibit to following characteristics: less persistent earnings, longer operating cycles, greater accruals, and more volatile cash flows, accruals and earnings, and these firms represent smaller firm size and higher probability to report a loss-making year. Taken together, all the reflected firm characteristics indicate lower earnings predictability.

The precision of accruals estimates can be determined by a few factors: economic and structural factors might result in variations in the precision of accruals estimates (although managers may or may not intervene in the reporting procedure); managerial expertise and discretion can also impact the estimation precision, if holding other influential factors constant. Therefore a mismatch between accruals and cash flow in adjacent periods can indicate that firms have disclosed honestly but

have been exposed to unexpected macro-economic circumstances; it could indicate a firm has incompetent managers during prediction process; or that a firm's managers are deliberately manipulate earnings reporting. However, Dechow and Dichev's (2002) model does not distinguish these factors during the estimation process. I recognise the modified Dechow and Dichev's model has drawbacks, but there is no agreed-upon solution to the problem of estimating errors, and this model is still one of the most extensively used accrual metrics. I estimate equation (4.2) for the sample over 11 years, 2000-2010. This data set allows me to include both a lead and a lag cash flow term in equation (4.2).

$$\frac{TCA_{j,t}}{Assets_{j,t}} = \beta_0 + \beta_1 \frac{CFO_{j,t-1}}{Assets_{j,t}} + \beta_2 \frac{CFO_{j,t}}{Assets_{j,t}} + \beta_3 \frac{CFO_{j,t+1}}{Assets_{j,t}} + \beta_4 \frac{\Delta Rev_{j,t}}{Assets_{j,t}} + \beta_5 \frac{PPE_{j,t}}{Assets_{j,t}}$$

$$+ \; \varepsilon_{j,t} \qquad\qquad (4.2)$$

where:

$TCA_{j,t}$ = firm j's total current accruals in year t = $\Delta CA_{j,t} - \Delta CL_{j,t} - \Delta Cash_{j,t} + \Delta STDebt_{j,t}$

$Assets_{j,t}$ = value of firm j's total assets in year t

$CFO_{j,t}$ = firm j's cash flow from operation in year t = $NIBE_{j,t} - TA_{j,t}$

$NIBE_{j,t}$ = firm j's net income before extraordinary items in year t

$TA_{j,t}$ = firm j's total accruals in year t = $\Delta CA_{j,t} - \Delta CL_{j,t} - \Delta Cash_{j,t} + \Delta STDebt_{j,t} - DEPN_{j,t}$

$\Delta Rev_{j,t}$ = firm j's change in revenues between year t and year $t-1$

$PPE_{j,t}$ = firm j's gross value of property, plant and equipment in year t

$\Delta CA_{j,t}$ = firm j's change in current assets between year t and year $t-1$;

$\Delta CL_{j,t}$ = firm j's change in current liabilities between year t and year $t-1$;

$\Delta Cash_{j,t}$ = firm j's change in cash and cash equivalent between year t and year $t-1$;

$\Delta STDebt_{j,t}$ = firm j's change in short-term debt between year t and year $t-1$;

$$DEPN_{j,t} = \text{firm } j\text{'s expense of depreciation and amortization in year } t$$

I run the cross-sectional model (4.2) using ordinary least squares (OLS) with White heteroscedasticity standard errors to generate a series of firm- and year-specific residuals $\varepsilon_{j,t}$, which form the basis in the accruals quality metric, EQ_j^1 =$\mu(\hat{\varepsilon}_{j,t})$. Larger value of EQ^1 refers to higher standard deviation of firm j's cash residuals, which indicates lower accruals quality.

The second metric of earnings quality adopted in the current research is the average of the absolute value of discretionary accruals (EQ^2), computed from the modified Jones' (1991) model. It is a predominant model in earnings management research. Johns decomposes total accruals into current and noncurrent accruals, then uses changes in cash-accompanying revenues (ΔRev) to proxy for current accruals and property, plant and equipment (PPE) to proxy for noncurrent accruals[22]. To estimate discretionary accruals for a given firm-year observation, I regress the following cross-sectional model (Mouselli et al. 2012).

$$\frac{TA_{j,t}}{Assets_{j,t-1}} = \beta_0 \frac{1}{Assets_{j,t-1}} + \beta_1 \frac{\Delta Rev_{j,t}}{Assets_{j,t-1}} + \beta_2 \frac{PPE_{j,t}}{Assets_{j,t-1}} + \varepsilon_{j,t} \qquad (4.3)$$

Following prior literature, I use ordinary least squares (OLS) regression to

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[22] The model development can be decomposed into several steps (Yoon et al., 2012):
Stage 1: Decomposition of total accruals ($TA_{j,t}$) into current accruals ($TCA_{j,t}$) and noncurrent accruals ($TNCA_{j,t}$):
$TA_{j,t} = TCA_{j,t} + TNCA_{j,t}$
Stage 2: Transformation into a statistical model:
$TA_{j,t} = \beta_0 + \beta_1 TCA_{j,t} + \beta_2 TNCA_{j,t} + \varepsilon_{j,t}$
Stage 3: Standardization by $Assets_{j,t-1}$ to control for heteroscedasticity:
$TA_{j,t}/Assets_{j,t-1} = \beta_0/Assets_{j,t-1} + \beta_1 TCA_{j,t}/Assets_{j,t-1} + \beta_2 TNCA_{j,t}/Assets_{j,t-1} + \varepsilon_{j,t}$
Stage 4: Replacement of $TCA_{j,t}$ and $TNCA_{j,t}$ with proxy variables:
$TA_{j,t}/Assets_{j,t-1} = \beta_0/Assets_{j,t-1} + \beta_1\Delta Rev_{j,t}/Assets_{j,t-1} + \beta_2 PPE_{j,t}/Assets_{j,t-1} + \varepsilon_{j,t}$
where: $Assets_{j,t-1} = $ lagged value of firm j's total assets

compute firm- and year-specific parameter estimates of β_0, β_1 and β_2. Next I estimate for each firm the non-discretionary accruals as a proportion of lagged total assets using the following equation:

$$NA_{j,t} = \hat{\beta}_0 \frac{1}{Assets_{j,t-1}} + \hat{\beta}_1 \frac{(\Delta Rev_{j,t} - \Delta AR_{j,t})}{Assets_{j,t-1}} + \hat{\beta}_2 \frac{PPE_{j,t}}{Assets_{j,t-1}} \qquad (4.4)$$

where:

$\Delta AR_{j,t}$ = firm j's change in accounts receivables between year t and year $t-1$

Non-discretionary accruals ($NA_{j,t}$) indicate the portion of total accruals that is contingent on firm j's sales growth other than managerial discretion. Change in accounts receivables ($\Delta AR_{j,t}$) is deducted from revenue change ($\Delta Rev_{j,t}$) to consider the probability of corporate credit sales manipulation, which could trigger more liberal credit terms to stimulate sales numbers prior to earnings announcement (Dechow et al., 1995). I then calculate firm j's discretionary accruals ($DAC_{i,t}$) by subtracting $NA_{j,t}$ from total accruals:

$$DAC_{j,t} = \frac{TA_{j,t}}{Assets_{j,t-1}} - NA_{j,t} \qquad (4.5)$$

I then take the absolute value of discretionary accruals $|DAC_{j,t}|$. Following Francis et al. (2008), I take the average of $|DAC_{j,t}|$ for each firm over the estimation period 2000-2010 to get a firm-year estimate EQ^2. A higher numerical value of EQ^2 indicates lower earnings quality. Considering the evidence that the average $|DAC|$ of multiple years generates similar results with a single year estimate of $|DAC|$ (Francis et al. 2008; Mouselli et al. 2012), I also run a single year ($t = 2010$) regression to get $|DAC_{j,t}|\_{2010}$, and confirmed the arguments of previous authors.

The modified Jones' (1991) model has appealing characteristics in that it assumes current accruals are proportional to changes in revenues determined by sales growth, and that noncurrent accruals change along with the gross value of property, plant and equipment (*PPE*), it thus captures the most important noncurrent accruals component, i.e., depreciation and amortization expenses. Considering sales growth and investment in *PPE* are genuine stimulators of firm value, the modified Jones (1991) model settles the relationship between these essential firm's entities and the components of accruals.

However, the shortcoming of Jones model is prominent. A few empirical studies criticise the low explanatory power of the Jones model. Dechow et al. (2010, pp.358) find only 10% of the variation in accruals is captured by Jones model. They indicate "discretionary accruals are less powerful than total accruals at detecting earnings management, and using the residuals from the Jones model as an indicator of poor accruals quality also suffers from the mis-classification of accruals as non-discretionary when they are not". In an earlier study, Dechow et al. (1995) report a positive relationship between cash residuals and total accruals (80% highly correlated) and earnings performance, and a negative relationship between residuals and cash flow performance. These findings suggest the mis-classification of normal accruals as discretionary components when they truly reflect a firm's fundamental performance. Xie (2001) gets similar conclusions that the cash residuals obtained using modified Jones model exhibit lower predictive power for earnings compared with non-discretionary accruals component.

The third measure of earnings quality (EQ^3) is earnings variability (i.e., Dechow and Dechev, 2002; Francis et al., 2008; Bhattacharya et al., 2011), measured by the standard deviation of the firm's earnings per share between 2000 and 2010.

Earnings here refer to earnings before extraordinary items, divided by total assets (Francis et al., 2008). Dechow and Dechev (2002) argue earnings variability is the strongest instrument to proxy earnings quality, where a higher scale of earnings volatility indicating lower earnings quality. In their study, earnings are decomposed as two elements of cash flows and accruals. The volatility of both earnings components is assumed to be negatively correlated with earnings quality, hence higher volatility in reported earnings implies lower earnings quality. This assumption is evidenced by the high Pearson and Spearman correlation coefficients between the standard deviation of earnings (0.82) and the standard deviation of accruals (0.75), showing that earnings variability can be used as a reliable metric to measure accruals quality.

In addition to the literature using earnings variability to proxy earnings quality, I have explained in the literature section that earnings variability is an important input in earnings predictability models. Graham et al.'s (2005) survey study reveals a prevalent managerial belief that earnings volatility lowers forecast accuracy. Dichev and Tang (2009, pp.179) endorse the inferences of earnings volatility to assess earnings predictability, they argue that "earnings volatility offers reliable discrimination on relative earnings persistence and predictability up to five-year horizons, and dominates in strength existing results like the accrual effect and the extreme-earnings mean-revert effect". They also argue that using earnings variability to proxy forecast accuracy excels using cash flows volatility and other accruals benchmarks.

The fourth earnings quality metric I used is the common factor score (EQ^4) derived from the factor analysis of the three preceding EQ metrics: EQ^1 the standard deviation of cash flow residuals, EQ^2 average of abnormal accruals, EQ^3 earnings

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variability (Francis et al., 2008; Bhattacharya et al., 2011). This common factor maintains the ordering of underlying variables, with larger values of EQ^4 indicating lower earnings quality.

The fifth earnings quality measure (EQ^5) is the standard deviation of discretionary revenues. Stubben (2010) proposes a revenue model to detect earnings manipulation. Discretionary revenue is defined as the difference between the actual change and the predicted change in receivables, with a greater difference indicating more severe revenue manipulation. It is criticized that accrual models are generally biased as including noisy estimates of earnings manipulation, which raise questions as to the reliability of conclusions based on those models (Bernard and Skinner, 1996). Stubben (2010) argues that modelling a single earnings element has the benefit to allow for integrating essential characteristics that are distinctive to the element, and hence can effectively reduce estimation errors. Moreover, how earning management proceeds can be better understood by concentrating exclusively on earnings components. He suggests revenue is worthwhile to be investigated, as it is a major earnings component and subject to management manipulation. He uses premature revenues and their impact on the relation between revenues and accounts receivables to proxy the component of manipulated revenues. The prematurely recognized revenues refer to the sales recognized before cash is received when managers aggressively or incorrectly apply GAAP.

Specifically, Stubben (2010) states that current accruals are usually resolved within a year. Hence, sales made towards the end of the year are more liable to stay on books at fiscal year-end. This revenue model[23] (4.6) allows the variance of

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[23] The model development can be decomposed into several steps (Stubben, 2010):

accounts receivables in the last quarter of accounting period:

$$\Delta AR_{j,t} = \alpha + \beta_1 \, \Delta Rev1\_3_{j,t} + \beta_2 \, \Delta Rev4_{j,t} + \varepsilon_{j,t} \qquad (4.6)$$

where:

$\Delta AR_{j,t}$ = firm j's change in accounts receivables between year t and $t-1$;

$Rev1\_3_{j,t}$ = firm j's revenues in the first three quarters in year t;

$Rev4_{j,t}$ = firm j's revenues in the fourth quarter in year t.

Stubben (2010) applies this model to a sample of firms that are subject to SEC[24] enforcement actions for a mix of revenue- and expense-related misstatements and argues that the revenue model is less biased, better specified, and more powerful than the widely adopted accrual models. However, this model has not been tested in any further earnings management research; the present research will provide empirical evidence of the usefulness of discretionary revenues as a measure of earnings quality.

4.4. Model specification

I modify the models used by Dhaliwal et al. (2012) and Hope (2003), and construct the following baseline model:

Step 1: decompose revenues (Rev) into discretionary revenues (∂^{DM}) and non-discretionary revenues R^{NM}:
$Rev_{j,t} = R_{j,t}^{NM} + \partial_{j,t}^{DM}$
Step 2: a proportion of non-discretionary revenues remain uncollected at the year-end, denoted as c, discretionary revenues are assumed uncollectable. Therefore, accounts receivables (AR) equals the portion of uncollected non-discretionary revenues ($c* R^{NM}$) and discretionary revenues (∂^{DM}):
$AR_{j,t} = c * R_{j,t}^{NM} + \partial_{j,t}^{DM}$
Step 3: rearrange terms and express change in receivables in terms of reported revenues.
$\Delta AR_{j,t} = c * \Delta Rev_{j,t} + (1-c) * \partial_{j,t}^{DM}$
Step 4: the estimate of firm's discretionary revenues is the residual from the following equation:
$\Delta AR_{j,t} = \alpha + \beta * \Delta Rev_{j,t} + \varepsilon_{j,t}$
[24] US Securities and Exchange Commission

$$FCERROR = f\ (FRD, EQ, Control\ variables) \qquad (4.7)$$

Model (4.7) is regressed separately for each of the three forecast horizons. The dependent variable, forecast error, takes the form of *FCERROR (0), FCERROR (1), FCERROR (2)*, which refer to the forecast error of one-year-ahead, two-year-ahead and three-year-ahead. In the present study, *FCERROR (0), FCERROR (1), FCERROR (2)* denote the forecast error of the fiscal years 2011, 2012 and 2013 respectively. The primary focus in this research, *FRD*, is a count variable, which measures the level of a firm's voluntary forward-looking risk disclosures in all narrative sections of annual reports. H_1 hypothesizes a significant negative association between *FRD* and *FCERROR*; therefore I predict a negative sign on *FRD*. Another main variable, *EQ*, is estimated using four accruals quality metrics and one discretionary revenue metric. H_2 hypothesizes a significant negative association between *EQ* and *FCERROR*, since all the *EQ* metrics are inverse measures of earnings quality, I predict a positive sign on *EQ*.

Following Dhaliwal et al. (2012), Dorestani and Rezaee (2011) and Hope (2003), I include several control variables that might confound the relationship between forecast error, risk disclosures and earnings quality. I include analyst following because more analysts following a firm cause intense competitions among analysts, who then have stronger motivation to improve forecast accuracy. Analyst following is measured by the number of brokers (*NBROKER*) issuing stock recommendations in Hemmington-Scott database. I also control for firm size (*SIZE*), measured by the natural log of total assets[25]. Firm size is viewed as an appropriate proxy for firm's general information setting; large firms generally report more stable earnings that are easier to predict (Dhaliwal et al., 2012). In addition, large firms are

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[25] Using the natural log of total number of employees to measure firm size yields similar results.

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generally more diversified in business activities and therefore have a lower systematic risk in earnings prediction. Firm profitability is also controlled for as it has a direct effect on firm value and is a key factor in analysts' forecast models. There is also empirical evidence that loss-making firms have more volatile earnings that are less predictable (Schleicher et al., 2007). Profitability is measured by return on capital employed (*ROCE*). Dividend pay-out (*POUT*) is measured by the ratio of dividends to the adjusted net earnings per share in the previous accounting period. Liquidity (*LIQU*) is estimated by a firm's current ratio, computed by the percentage of total current assets to total current liabilities. Leverage (*GEAR*) is estimated by total debt/ total capital. Asset growth (*GROW*) is estimated by TA_t / TA_{t-1}, where TA is the book value of the firm's total assets. Finally, I control for the industry impact using dummy variables (*IND*) (Industry classification criteria is the same as in Chapter 2 and 3). Larger estimation errors are generally observed in the firms in volatile industries, albeit their managers have expertise and good intentions. Data pertaining to the control variables are collected for the fiscal year 2010 from *DataStream*.

4.5. Sample and data collection

I continue to use the same sample set I used in Chapter 2 (pp.67) and Chapter 3 (pp.121) to ensure the results are comparable. The initial sample comprises 240 firms which covers all UK non-financial institutions listed within the FTSE 350 index in 2010 (according to the 2010 FTSE 350 index company list published by *Thomson Reuters*). Three firms are deleted since their annual reports are not available, leaving 237 observations. In order to obtain earnings quality score I only keep the industry

sectors for which at least 10 observations were available in year 2010[26] (Mouselli et al., 2012). Three industry sectors are removed accordingly, and are: "health care" sector (8 firms), "Telecommunications" sector (5 firms), and "Utilities" sector (9 firms) (see Table 4.1 for sample industry coverage). The sample in this research has greater variation in firm characteristics than many prior UK studies such as Abraham and Cox (2007) and Linsley and Shrives (2006), which focus solely on FTSE100 firms.

Table 4.1
Industry coverage

Industry Sector	Obs.	FCERROR (0)	FCERROR (1)	FCERROR (2)
Basic Materials	19	0.047	0.091	0.131
Consumer Goods	22	0.053	0.058	0.039
Consumer Services	48	0.038	0.045	0.034
Industrials	52	0.038	0.038	0.043
Oil & Gas	14	0.136	0.148	0.181
Technology	15	0.062	0.045	0.060

Notes: industry classification is obtained from *Thomson Reuters* 2010. *FCERROR (0)*, *FCERROR (1)*, *FCERROR (2)* = earnings forecast error in year 2011, 2012, 2013 respectively, calculated by the absolute value of the difference between the mean forecast earnings per share and actual earnings per share, scaled by the absolute value of actual earnings.

All annual reports were collected from the companies' websites for the fiscal year 2009/10. I obtain the financial data required for earnings quality models from *DataStream*, and analyst forecast data from the Institutional Brokers' Estimate System *I/B/E/S*. I exclude firms with missing accounting and financial data, therefore the final sample contains 170 observations. The sample comprises the largest listed UK firms based on market capitalisation.

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[26] The results are robust if the three industries with less than 10 observations are not deleted.

I collect the data for three earnings forecast horizons: one-year-ahead (2011), two-year-ahead (2012) and three-year-ahead (2013). I set up to two years forecast horizons as short-term and up to three years forecast horizons as long-term.

FRD counts are collected for the year 2010. I focus on explaining cross-sectional variations in forward-looking risk disclosures and whether they impact on forecast error. I do not examine time-series difference in disclosures. This is common approach of disclosure studies (i.e. Botosan, 1997; Linsley and Shrives, 2005, 2006; Abraham and Cox, 2007) and also ensures the sample is free of variations that are caused by changing regulations or political environments. Additionally, given the time-intensive nature of the data collection in this study (manual), a time-series dimension is not a practical option.

To adopt earnings quality metrics, it is required that a firm has at least twelve years of financial data during years 2000-2011. The test period starts from the year 2000 because this is the first year for which many accounting ratios are available from *DataStream*.

I winsorize all firm-specific variables (except *FRD*) at 5% level to ensure my results are not affected by extreme values. To maintain the substantial variation in forward-looking risk disclosures levels and reveal the true disclosures approach of each individual observation, I tend not to winsorize the *FRD* data.

4.6. Empirical results

4.6.1. Summary statistics

Table 4.2 presents descriptive statistics of forecast error, risk disclosure, earning

quality, and other control variables. In terms of forecast error, the average value of *FCERROR* increases from 0.051, 0.058 to 0.062, with the increase of forecast horizons as represented by *FCERROR (0)*, *FCERROR (1)* and *FCERROR (2)* respectively. This is in line with existing literature (Dhaliwal et al., 2012) that indicates when forecast horizon increases, analysts' predictability decrease as does the reliability of predicted earnings. My computed forecast error data are close to the mean forecast error estimates reported by Dhaliwal et al. (2012) of 0.037, 0.068 and 0.097 in three forecast horizons respectively in a UK sample from the period 1994-2007. The standard deviation of *FCERROR* also rise with the increase of forecast horizons, showing as 0.058 for *FCERROR (0)*, 0.069 for *FCERROR (1)*, and 0.094 for *FCERROR (2)*. This indicates that analysts have more diverse opinions on their forecast due to their lower accuracy of earnings anticipation in the long term. More evidence can be observed from their minimum and maximum values which range from 0.002 to 0.234 for *FCERROR (0)* but comparatively wider from 0.001 to 0.352 for *FCERROR (2)*. *FCERROR§* calculated using median value of analyst estimates exhibit similar pattern.

Table 4.2

Descriptive statistics

Variables	Obs.	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
Forecast error							
FCERROR (0)	165	0.051	0.058	0.002	0.234	1.989	6.340
FCERROR (1)	161	0.058	0.069	0.004	0.259	1.824	5.352
FCERROR (2)	158	0.062	0.094	0.001	0.352	2.179	6.657
FCERROR§ (0)	165	0.046	0.053	0.003	0.227	2.222	7.611
FCERROR§ (1)	161	0.060	0.083	0.002	0.328	2.217	7.093
FCERROR§ (2)	158	0.055	0.087	0.001	0.343	2.420	7.870
Risk disclosure							
FRD_total	170	129	60.942	28	420	1.589	7.295

FRD_fr	170	18	13.951	0	75	1.522	5.511
FRD_or	170	53	29.176	7	208	1.609	8.362
FRD_sr	170	43	28.372	3	191	1.930	8.670
FRD_b	170	34	26.159	4	170	2.716	12.575
FRD_g	170	94	43.488	17	250	1.052	4.815
FRD_qn	170	8	7.402	0	40	1.538	5.647
FRD_ql	170	120	56.649	28	401	1.674	8.047
Earnings quality							
EQ[1]	170	0.040	0.030	0.010	0.123	1.385	4.196
EQ[2]	170	0.066	0.034	0.027	0.162	1.340	4.152
EQ[3]	170	0.056	0.048	0.012	0.198	1.641	5.106
EQ[4]	170	-0.042	0.940	-1.168	3.078	1.381	4.561
EQ[5]	141	0.014	0.022	0.0002	0.087	1.729	4.794
Other control variables							
NBROKER	168	1.993	0.494	0	2.708	-1.731	6.943
RISK	170	1.092	0.261	0.650	1.550	0.069	1.932
SIZE	170	14.388	1.341	12.357	17.383	0.515	2.584
POUT	170	33.509	20.779	0	68.560	-0.295	2.034
LIQU	170	1.593	1.012	0.460	4.520	1.527	4.850
GEAR	170	33.181	22.958	0	82.220	0.394	2.395
GROW	170	0.090	0.131	-0.093	0.422	0.992	3.557
ROCE	170	13.578	9.238	0.310	35.000	0.783	2.985

Notes: *FCERROR (0)*, *FCERROR (1)*, *FCERROR (2)* = earnings forecast error in year 2011, 2012, 2013 respectively, calculated by the absolute value of the difference between the mean forecast earnings per share and actual earnings per share, scaled by the absolute value of actual earnings; *FCERROR§ (0)*, *FCERROR§ (1)*, *FCERROR§ (2)* = earnings forecast error in year 2011, 2012, 2013 respectively, calculated by the absolute value of the difference between the median forecast earnings per share and actual earnings per share, scaled by the absolute value of actual earnings.

FRD_total = total number of forward-looking risk disclosures include internal control risk management strategies; *FRD_fr* = total number of forward-looking financial risk disclosures; *FRD_or* = total number of forward-looking operational risk disclosures; *FRD_sr* = total number of forward-looking strategic risk disclosures; *FRD_b*= total number of forward-looking bad risk news disclosures; *FRD_g*= total number of forward-looking good and neutral risk news disclosures; *FRD_qn*= total number of forward-looking quantitative risk disclosures; *FRD_ql*= total number of forward-looking qualitative risk disclosures;

EQ[1] = standard deviation of firm *j*'s cash residuals; *EQ[2]* = average of the absolute value of firm *j*'s discretionary accruals; *EQ[3]* = earnings variability, measured by the standard deviation of the firm *j*'s earnings per share; *EQ[4]* = common factor score derived from the factor analysis of *EQ[1]*, *EQ[2]*, and *EQ[3]*; *EQ[5]* = standard deviation of discretionary revenues.

NBROKER = natural log of the number of brokers issuing stock recommendations in Hemmington-Scott database; *RISK* = beta from London Business School's *Risk Management Service*; *SIZE* = natural log of total assets; *POUT* = dividend payout; *LIQU* = current ratio, using total current assets divided by total current liabilities; *GEAR* = natural log of equity gearing, calculated by total debt over total capital; *GROW* = asset growth, calculated by log of TA_t/TA_{t-1}, where TA is the book value of total assets; *ROCE* = return on capital employed.

Focusing on risk disclosure measures, the average level of voluntary forward-looking risk disclosures (*FRD_total*) of my sample is 129 sentences. There is a

comparatively large variation of *FRD* across the sample which is reflected in the standard deviation of 60.942, with a minimum disclosure of 28 sentences, and a maximum of 420 disclosure sentences. It reflects the massive difference in firms' risk disclosure approaches. Breaking down the *FRD_total* into different component categories, I first find that firms are less likely to disclose financial risks in narrative sections of annual reports (with only 18 average sentences in *FRD_fr*, much smaller than 53 average sentences in *FRD_or* and 43 average sentences in *FRD_sr*. The main reason can be financial risk disclosure is commonly compulsory disclosure by accounting regulations and are frequently disclosed in 'financial statements', managers thus have less intension to voluntarily disclose these information in narrative sections of annual report. I also observe a clear dominance of 'good news' and 'qualitative news'. This reveals that managers are more confident at reporting 'good news' (194 sentences) over 'bad news' (34 sentences), and prefer to use a more descriptive ('qualitative') form of disclosure (120 sentences) over 'quantitative' disclosure (8 sentences), which presumably provides more flexibility in how these may be interpreted by investors and other users of accounts. The manually collected *FRD* count in this thesis is insignificantly different from normal distribution by observing the values of skewness and kurtosis.

Turning to earnings quality proxies, I first find that the average estimate of earnings quality matrix EQ^1 (the standard deviation of cash flow residuals) 0.040 in my sample, is larger than the average accruals quality (*AQ*) estimates presented by Dechow and Dichev (2002) 0.028, Francis et al. (2005) 0.026, and Francis et al. (2008) 0.0159, which apply the same method. These differences may be due to the

different sample selection and time period used to calculate the earnings quality[27]. The standard deviation of EQ^1 is 0.030, indicating considerable cross-sectional variation in this variable. The other metrics for earnings quality, EQ^2 (average of absolute value of abnormal accruals), EQ^3 (standard deviation of earnings per share), EQ^5 (standard deviation of discretionary revenues)[28], reveal similar distributional properties as EQ^1: their standard deviations (0.034, 0.048, and 0.022 respectively) are large compared with the mean values (0.066, 0.056, and 0.014 respectively), suggesting nontrivial within-sample cross-sectional variation in earnings quality[29].

As to other control variables, the average value for the logarithm of number of brokers (*NBROKER*) is 1.993 with standard deviation of 0.494. The average value of firm size (*SIZE*) of the present sample is 14.388, and the average return on capital (*ROCE*) is 13.578. It can be argued that the sample over represents successful firms, which might cause survivorship bias, but considering that my focus is risk disclosure, larger firms are more likely to offer a richer and more diverse set of potential risk disclosures. Despite the potential bias towards large surviving firms, the standard deviations of firm size and return on capital are consequential: 1.341 (*SIZE*) and 9.238 (*ROCE*), suggesting sufficient variation in my sample.

Table 4.3 reports the Pairwise correlations between forecast error (*FCERROR(Y)*), forward-looking risk disclosures (*FRD_total*), and earnings quality measures (*EQ*) as well as other influential factors that might affect analyst earnings

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[27] I select the non-financial institutions that were constituents of the FTSE100 and Mid-250 indices during the period 2000-2011. Dechow and Dichev (2002) obtain their sample for 1,725 firms across 136 industries between 1987 and 1999. Francis et al.'s (2005) sample covers 27 years from 1975 to 2001 for an average of 1,475 firms per year. Francis et al. (2008) use 677 US firms between 1991 and 2001.

[28] EQ^4 is the common factor of EQ^1, EQ^2 and EQ^3, it is obtained by 'factor analysis' using Stata. Factor analysis is a statistical technique for data reduction. It reduces the number of variables in an analysis by describing linear combinations of the variables that contain most of the information and that hopefully admit meaningful interpretations.

[29] Due to the unavailability of quarterly revenue data, EQ^5 has fewer observations than EQ^1-EQ^4.

predictability. Correlations between forecast error estimates of three horizons are substantial, ranging from 30% to 65% (all significant at 5% level). Correlations between the four alternative proxies of accruals quality also exhibit large coefficients, in no case below 43% (all significant at 5% level except for EQ^5)[30]. The common factor EQ^4 exhibits high correlations with all underlying proxies suggesting that EQ^4 is a meaningful representation of the alternative earnings quality proxies[31], and that my main results should not be affected when choosing different metrics.

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[30] EQ^1 - EQ^4 are estimates of accruals quality, EQ^5 is computed by discretionary revenue.
[31] EQ^4 is used in the baseline model in the main regressions.

Table 4.3

Correlation matrix

	FCER ROR (0)	FCER ROR (1)	FCER ROR (2)	FRD_ total	EQ^1	EQ^2	EQ^3	EQ^4	EQ^5	NBR OKE R	RISK	SIZE	POUT	LIQU	GEAR	GROW	ROCE
FCERROR(0)	1.00																
FCERROR(1)	0.43*	1.00															
FCERROR(2)	0.30*	0.65*	1.00														
FRD_total	-0.06	-0.09	0.07	1.00													
EQ^1	0.33*	0.44*	0.16*	-0.20*	1.00												
EQ^2	0.25*	0.28*	0.18*	-0.10	0.66*	1.00											
EQ^3	0.26*	0.41*	0.27*	-0.22*	0.70*	0.43*	1.00										
EQ^4	0.33*	0.46*	0.25*	-0.20*	0.92*	0.79*	0.84*	1.00									
EQ^5	0.20*	0.10	0.05	-0.11	0.13	0.10	0.02	0.09	1.00								
NBROKER	-0.09	-0.22*	-0.19*	-0.05	-0.07	0.01	-0.06	-0.05	-0.02	1.00							
RISK	0.06	0.11	0.14	-0.03	0.07	0.02	0.15	0.13	-0.21*	-0.09	1.00						
SIZE	0.02	-0.03	0.04	0.53*	-0.28*	-0.23*	-0.27*	-0.30*	-0.02	0.00	0.03	1.00					
POUT	-0.35*	-0.35*	-0.34*	-0.02	-0.25*	-0.18*	-0.21*	-0.26*	0.12	0.05	-0.13	-0.02	1.00				
LIQU	0.27*	0.28*	0.25*	-0.16*	0.36*	0.07	0.28*	0.29*	0.09	-0.17*	0.00	-0.17*	-0.26*	1.00			
GEAR	-0.09	-0.23*	-0.20*	0.22*	-0.26*	-0.16*	-0.27*	-0.28*	-0.03	0.01	-0.07	0.20*	0.04	-0.45*	1.00		
GROW	0.13	0.28*	0.33*	0.06	0.12	0.12	0.19*	0.17*	0.01	-0.11	-0.05	0.00	-0.19*	0.31*	-0.34*	1.00	
ROCE	-0.01	-0.13	-0.04	-0.08	0.15	0.01	0.22*	0.15	0.07	-0.06	-0.16*	-0.26*	0.08	0.10	-0.09	0.27*	1.00

Notes: variable definitions see Table 4.2. I report the pairwise correlations between forecast error (*FCERROR*), total volume of forward-looking risk disclosure (*FRD_total*) and earnings quality proxies (*EQ*) as well as firm-specific variables. * indicates significance at 5% level.

I also observe a negative association between *FCERROR (Y)* and *FRD* in one-year and two-year ahead forecast horizon, which supports the hypothesis of a negative association between analyst forecast accuracy and a firm's forward-looking risk disclosures, indicating that a higher level of risk disclosures looking forward contributes to a lower forecast error, and that this predicted power is short-term. The predicted sign denotes a positive association between all of the five earnings quality metrics[32] and forecast error in three forecast horizons, in most cases significant at 5% level, which supports the hypothesis that higher earnings quality leads to lower forecast error or higher earnings predictability and that the predictive power of earnings quality is long-term.

The correlations between *FRD* and five *EQ* metrics are all negative, which supports the notion of a complementary relationship between the two variables (i.e., Francis et al., 2008; Dhaliwal et al., 2012; Dye, 1985; Jung and Kwon, 1988) in that firms with low (high) earnings quality disclose less (more) information, because investors treat the disclosures of such firms as less credible.

Another figure worth noting is the correlation between *SIZE* and *FRD*, 0.53 significant at 5% level. This is in line with previous literature which indicates that larger firms face more regulatory and social pressures and thus are inclined to release more diverse risk information. Other correlation coefficients present in Table 3 are comparatively low, within the tolerance of multicollinearity.

4.6.2. Regression results

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[32] All the *EQ* metrics are inverse measures of earnings quality, so larger value of *EQ* indicates lower earnings quality.

Considering the potential complimentary or substitutive relationship between *FRD* and *EQ,* which is suggested in previous literature and is used for information risk proxies, I apply the univariate and multivariate analysis to test the two hypothesized relationship between *FRD/ FCERROR(Y)* and *EQ^X /FCERROR(Y)*. Another variable I test separately is firm risk (*RISK*) measured by beta. In Chapter 3 (pp.132) I report a significant negative association between *FRD* and *Beta* after controlled for various firm-specific characteristics; therefore, to avoid the problem of multicollinearity, I test firm risk factor separately in the baseline model, the results are presented in Table 4.4.

In Table 4.4, columns I, V, IX report negative associations between *FCERROR* and *FRD* consistently for the three forecast horizons, unconditional on firm's earnings quality and risk level. For forecast errors calculated for one-year ahead and two-year ahead period horizons, my main variable of interest *FRD* exhibits negative coefficients, significant at 5% level in 2011 and 10% level in 2012. However, I do not observe a negative relationship for the three-year ahead forecast horizon. The coefficient estimates on *FRD*, -0.0001 or -0.01% (one-year ahead and two-years ahead) is subtle and does not show much variation in the two years, but the significance level declines from 5% to 10%. After controlled for earnings quality and risk factors, results are still consistent. These findings indicate that forward-looking risk disclosure has a subtle but significant effect on improving forecast accuracy in short-term period, and the reducing effect on earnings forecast error decrease dramatically when the prediction periods increase, supporting Hypothesis 1.

Table 4.4
Regression results (baseline model)

Main variables:	FCERROR (0)				FCERROR (1)				FCERROR (2)			
	I	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**
FRD_total	-0.0001**		-0.0001**	-0.0001**	-0.0001*		-0.0001*	-0.0001*	0.00004		0.00004	0.00004
	(0.035)		(0.042)	(0.039)	(0.088)		(0.082)	(0.071)	(0.720)		(0.725)	(0.702)
EQ^4		0.012**	0.013**	0.013**		0.030***	0.030***	0.030***		0.018*	0.017*	0.017*
		(0.016)	(0.015)	(0.017)		(0.000)	(0.000)	(0.000)		(0.061)	(0.063)	(0.085)
Control variables:												
RISK				-0.001				-0.012				0.009
				(0.953)				(0.499)				(0.775)
NBROKER	-0.017*	-0.016*	-0.015	-0.015	-0.029**	-0.023**	-0.022**	-0.022*	-0.024	-0.020	-0.020	-0.020
	(0.052)	(0.087)	(0.103)	(0.104)	(0.014)	(0.036)	(0.051)	(0.051)	(0.203)	(0.270)	(0.265)	(0.268)
SIZE	0.007**	0.006**	0.009***	0.009***	-0.001	0.001	0.004	0.004	0.003	0.006	0.005	0.005
	(0.038)	(0.043)	(0.007)	(0.007)	(0.841)	(0.740)	(0.287)	(0.258)	(0.648)	(0.304)	(0.426)	(0.441)
POUT	-0.001***	-0.001**	-0.001**	-0.001**	-0.001***	-0.0004*	-0.0004*	-0.0004**	-0.001***	-0.001**	-0.001**	-0.001**
	(0.004)	(0.020)	(0.022)	(0.024)	(0.003)	(0.053)	(0.057)	(0.044)	(0.003)	(0.014)	(0.014)	(0.019)
LIQU	0.014**	0.013**	0.012*	0.012*	0.006	0.002	0.001	0.001	0.005	0.001	0.001	0.002
	(0.026)	(0.043)	(0.052)	(0.053)	(0.248)	(0.766)	(0.849)	(0.909)	(0.576)	(0.890)	(0.881)	(0.860)
GEAR	0.0003	0.0003*	0.0004**	0.0004*	-0.0003	-0.0002	-0.0002	-0.0002	-0.0004	-0.0003	-0.0003	-0.0003
	(0.109)	(0.083)	(0.049)	(0.051)	(0.219)	(0.259)	(0.410)	(0.377)	(0.230)	(0.280)	(0.270)	(0.290)
GROW	-0.007	-0.018	-0.014	-0.014	0.071	0.047	0.051	0.048	0.074	0.068	0.067	0.070
	(0.841)	(0.638)	(0.715)	(0.715)	(0.110)	(0.248)	(0.229)	(0.270)	(0.215)	(0.234)	(0.243)	(0.234)
ROCE	0.0004	0.0003	0.0003	0.0003	-0.001*	-0.001**	-0.001**	-0.001**	-0.0004	-0.001	-0.001	-0.001
	(0.447)	(0.550)	(0.515)	(0.526)	(0.070)	(0.017)	(0.021)	(0.020)	(0.654)	(0.538)	(0.531)	(0.592)
Intercept	-0.050	-0.053	-0.078	-0.077	0.169**	0.126**	0.101	0.114*	0.088	0.036	0.045	0.036
	(0.346)	(0.302)	(0.127)	(0.170)	(0.030)	(0.037)	(0.112)	(0.084)	(0.453)	(0.748)	(0.700)	(0.787)
Adj. R^2	0.27	0.29	0.30	0.30	0.29	0.42	0.42	0.42	0.23	0.26	0.25	0.25
Obs.	163	163	163	163	160	160	160	160	157	157	157	157

Notes: variable definitions see Table 2. I report the coefficient estimates and *p*-values (in parentheses) obtained from ordinary least squares (OLS) regressions of *FCERROR* on *FRD* and *EQ*, conditional on other factors expected to affect forecast accuracy. ***, ** and * indicate significance at 1%, 5% and 10% level respectively. Industry dummies are included in all specifications but not reported in this table.

Columns II, VI and X in Table 4.4 present the regression results for testing Hypothesis 2. I observe a consistent and significant positive relationship between EQ^4 and *FCERROR* across the three forecast horizons which supports H$_2$. This finding suggests that higher earnings quality can assist analysts in improving earnings predictability for a longer forecast horizon. I next report the results, excluding the risk factor in view of the potential multicollinearity between *FRD* and *Beta*. The results are presented in columns III, VII and XI. I observe that coefficients between *FCERROR* and *FRD* and *EQ* indicate no significant differences. In columns IV, VIII and XII, I present results for the full model, including the risk factor for further consideration. I find consistent results in all circumstances, suggesting results do not suffer from multicollinearity and are robust. Overall, the evidence indicates forward-looking risk disclosures can mitigate forecast error for a short-run horizon, while in longer term, earnings quality is more effective in reducing forecast error.

Table 4.5 presents regression results for the baseline model after replacing EQ^4 with four alternative earnings quality metrics EQ^1, EQ^2, EQ^3 and EQ^5. I tabulate results for the three forecast horizons, and find the four earnings quality metrics follow the similar pattern of those reported in Table 4.4[33].

Table 4.6 reports the results after replacing *FCERROR (Y)* with *FCERROR§ (Y)*, where I change the mean value of earnings forecast to the median value of earnings forecast when I compute the estimates of forecast error. Dorestani and Rezaee (2011) use medians to compute the analyst forecast error and argue that when a distribution is skewed, the median can be regarded as a superior measure of the mid-point. In the first column of one-year ahead forecast horizon, I observe that

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[33] Although the coefficients on EQ^1 and EQ^2 are not precisely determined, they are consistently significant on EQ^3 and EQ^5 for *FCERROR (2)*.

FRD is significant negatively related to forecast error[34]. The coefficient (-0.0001) remains unchanged as in Table 4.4 column IV. Figures in column two and three (of two-year and three-year ahead forecast horizons respectively) do not show a significant association between *FRD* and *FCERROR§*, suggesting a short-term predictive power of *FRD*. In respect of earnings quality metrics, the results are robust with those reported in Table 4.4 and 4.5, which further support Hypothesis 2.

Table 4.5

Replace *EQ^4* by 4 other earnings quality proxies

	FCERROR (0)	*FCERROR (1)*	*FCERROR (2)*
Panel A:			
FRD	-0.0001**	-0.0001*	0.00005
	(0.035)	(0.078)	(0.686)
EQ^1	0.375**	0.903***	0.190
	(0.031)	(0.000)	(0.561)
Adj. R^2	0.29	0.41	0.23
Obs.	163	160	157
Panel B:			
FRD	-0.0001**	-0.0001*	0.00004
	(0.027)	(0.059)	(0.757)
EQ^2	0.269*	0.412**	0.328
	(0.067)	(0.014)	(0.187)
Adj. R^2	0.29	0.32	0.24
Obs.	163	160	157
Panel C:			
FRD	-0.0001*	-0.0001	0.00006
	(0.06)	(0.158)	(0.585)
EQ^3	0.185**	0.533***	0.384**
	(0.038)	(0.001)	(0.040)
Adj. R^2	0.28	0.39	0.26
Obs.	163	160	157
Panel D:			
FRD	-0.0001*	-0.0001*	0.00001
	(0.081)	(0.053)	(0.909)
EQ^5	0.550***	0.416*	0.484**
	(0.005)	(0.094)	(0.047)
Adj. R^2	0.25	0.21	0.22
Obs.	140	140	140

Notes: variable definitions see Table 4.2. I report the coefficient estimates and *p*-values (in parentheses) obtained from ordinary least squares (OLS) regressions of *FCERROR* on *FRD* and *EQ,* conditional on other factors expected to affect forecast accuracy. ***, ** and * indicate significance at 1%, 5% and 10% level respectively. Industry dummies are included in all specifications but not reported in this table.

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[34] Although the coefficient on *FRD* is not precisely determined for *FCERROR (0)* in Panel C, it is consistently significant in other panels.

Table 4.6

Replace *FCERROR (X)* by *FCERROR§ (X)*

	FCERROR§ (0)	*FCERROR§ (1)*	*FCERROR§ (2)*
Panel A:			
FRD	-0.0001*	-0.0001	0.00004
	(0.080)	(0.119)	(0.712)
EQ^1	0.386**	1.072***	0.264
	(0.012)	(0.000)	(0.382)
Adj. R^2	0.28	0.31	0.20
Obs.	163	160	157
Panel B:			
FRD	-0.0001*	-0.0001	0.00003
	(0.063)	(0.105)	(0.776)
EQ^2	0.2298*	0.4101**	0.322
	(0.082)	(0.050)	(0.163)
Adj. R^2	0.26	0.22	0.21
Obs.	163	160	157
Panel C:			
FRD	-0.0001	-0.0001	0.00006
	(0.130)	(0.226)	(0.606)
EQ^3	0.163**	0.631***	0.387**
	(0.040)	(0.001)	(0.034)
Adj. R^2	0.26	0.29	0.23
Obs.	163	160	157
Panel D:			
FRD	-0.0001*	-0.0001	0.00004
	(0.088)	(0.110)	(0.725)
EQ^4	0.012**	0.035***	0.018**
	(0.012)	(0.000)	(0.049)
Adj. R^2	0.27	0.32	0.22
Obs.	163	160	157
Panel E:			
FRD	-0.0001*	-0.0002*	0.00003
	(0.077)	(0.060)	(0.813)
EQ^5	0.530***	0.547*	0.462*
	(0.006)	(0.074)	(0.060)
Adj. R^2	0.28	0.13	0.21
Obs.	140	140	140

Notes: variable definitions see Table 4.2. I report the coefficient estimates and *p*-values (in parentheses) obtained from ordinary least squares (OLS) regressions of *FCERROR§* on *FRD* and *EQ*, conditional on other factors expected to affect forecast accuracy. ***, ** and * indicate significance at 1%, 5% and 10% level respectively. Industry dummies are included in all specifications but not reported in this table.

4.6.3. Additional analyses

4.6.3.1. Detailed Risk Categorises on FCERROR

The detailed data construction in the present research allows I to present additional evidence regarding the sensitivity of forward-looking risk disclosures to analyst forecast accuracy varies for different risk categorises. I disaggregate the total number of forward-looking risk disclosures into: financial risk (*FRD_FR*), operational risk (*FRD_OR*) and strategic risk (*FRD_SR*) disclosures according to the content of risk information. Linsley and Shrives (2006) report significant differences in the frequencies of reported 'good news' and 'bad news' risk disclosures. I follow their approach and further classify forward-looking risk disclosures as good news [35] (*FRD_G*), or bad news (*FRD_B*), and whether they are quantitative (*FRD_QN*) or qualitative (*FRD_QL*) in nature. In Table 4.7, the coefficients of *FRD_FR* (Panel C) and *FRD_SR* (Panel E) are both significant for a one-year ahead horizon, with the sensitivity of the former (-0.0006) three times that of the latter (-0.0002). This suggests voluntarily disclosing more forward-looking financial risks helps drive down forecast errors in a more effective way. As noted earlier, forward-looking operational and strategic risk disclosures constitute the vast majority of total risk disclosures, and are much more frequent than financial risk disclosures. The main reason is most of the sample firms put financial risks in the "Notes to the Financial Statement" (compulsory disclosures per accounting regulations[36]); few voluntarily release this information in narratives within annual reports. The lack of financial risk disclosures makes them more valuable to investors. The higher elasticity of financial risk disclosures can also be explained by the nature of this risk category: financial

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[35] Good news includes both positive and neutral risk information.
[36] For example: The Financial Accounting Standards Board (FASB) and The Institute of Chartered Accountants in England and Wales (ICAEW) whose primary purpose is to establish and improve generally accepted accounting principles (GAAP) in the public's interest.

risks have an immediate effect on assets and liabilities of a monetary character, and are the key forms of information analysts would incorporate in evaluation of a firm's value. I also observe a short-term significant negative association between *FRD_SR* and *FCERROR*. Strategic risk encompass the macro operating environment of the company that can directly impact on firm's assets and liabilities, and can also impact on cash flow and profits. However, the coefficient on *FRD_OR* is not precisely determined for *FCERROR (0)*. Operational risks exclusively pertain to firm-specific internal risks which are under the control of the executive board; this information has been found to be effective in reducing firm risk (empirical results are presented in Chapter 3, pp.132), but might not contribute as much as financial and strategic risks in enabling analysts to assess firm value, which is the essential information in analyst earnings forecast process.

The coefficients of *FRD_G* are significant for both one-year and two-year forecast horizons, at 5% level (Panel A). In addition, *FRD_G* exhibits higher elasticity -0.0002 than *FRD_total* (-0.0001). This result is consistent with my previous finding (empirical results in Chapter 3, pp.135) that good news signals profit, promoting opportunities in the future which can effectively reduce firm systematic risk, therefore improving earnings predictability. However the coefficients of *FRD_B* are not significant neither in short-term nor long-term forecast horizon. This can be explained that bad news covers potential threats that might harm firm value and expose a firm to uncertainties, more uncertain circumstances will inevitably increase the unpredictable factors in earnings forecast, and increase forecast error accordingly. On the other hand, when more bad news is released, analysts are informed about the firm's real operation performance and can better evaluate the risk impact in their portfolio formation, which is useful in

generating a more accurate earnings forecast. These two effects cancel out each other and are explainable for the insignificance of *FRD_B* on *FCERROR*.

In view of the nature of risk disclosure, I observe that after quantifying the risk information, the elasticity changes dramatically from -0.0001 (*FRD_QL*) to -0.001(*FRD_QN*), and the sensitivity lasts for a two-year forecast horizon. -0.001 is also the highest coefficient compared with *FRD_total* and other detailed risk categories. This indicates that forecast error can be significant reduced if the size of the risk can be quantified so as to enable analysts estimate the potential monetary impact of said risk in a precise way. This finding is in line with previous literature that quantification of a project can improve its persuasiveness among investors since the project credibility is greatly enhanced (Kadous et al., 2005). Likewise, the difficulties in quantifying future risks make them more valuable to analysts. For fear of being held responsible for legal claims when irretrievable errors in judgment occur based on erroneous estimations of future risks, directors are more inclined to avoid discussing unpredictable speculative bad news in a quantitative manner.

Overall, the detailed risk categorises are consistent with findings for the aggregate risk disclosures *FRD_total*, with a lowering effect on forecast error in the short term.

4.6.3.2. Results for EQ on FCERROR, Conditional on Different Risk Categories

In Table 4.7, I find significant positive associations between EQ^4 and *FCERROR* conditional across different risk categories, and the predictive power of earnings

quality is both long term and consistent when I change earnings quality metrics[37]. This result supports Dhaliwal et al.'s (2012) finding that their financial opaqueness measure (scaled accruals) is significant and positively associated with forecast error in all three horizons after controlling for the level of voluntary disclosure. In addition, I observe a higher sensitivity of *EQ⁴* on *FCERROR* in the short term (up to a two-year forecast horizon) that declines for a three-year forecast horizon. Dhaliwal et al. (2012) suggest a complementary relationship exists between non-financial disclosures and accruals which can be depicted by the co-instantaneous slop coefficients increase of disclosures. I support that notion and add that earnings quality, as proxied by accrual quality and discretionary revenue, has long-term predictive power relative to earnings, incremental to the short-term predictive power relative to *FRD* disclosures.

Table 4.7

Forecast error and detailed risk disclosures

	FCERROR (0)	FCERROR (1)	FCERROR (2)
Panel A:			
FRD_G	-0.0002**	-0.0002**	0.00003
	(0.042)	(0.045)	(0.863)
EQ^4	0.126**	0.030***	0.017*
	(0.017)	(0.000)	(0.086)
Adj. R^2	0.30	0.42	0.25
Obs.	163	160	157
Panel B:			
FRD_B	-0.0002	-0.0001	0.0001
	(0.204)	(0.474)	(0.486)
EQ^4	0.012**	0.030***	0.017*
	(0.020)	(0.000)	(0.080)
Adj. R^2	0.29	0.41	0.25
Obs.	163	160	157
Panel C:			
FRD_FR	-0.0006*	-0.0004	0.0002
	(0.084)	(0.390)	(0.716)

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[37] I replace *EQ⁴* with 4 other earnings quality metrics: *EQ¹, EQ², EQ³, EQ⁵*; the results are robust in all circumstances.

EQ^4	0.013**	0.030***	0.017*
	(0.013)	(0.000)	(0.090)
Adj. R^2	0.30	0.42	0.25
Obs.	163	160	157
Panel D:			
FRD_OR	-0.0001	-0.0001	0.0003
	(0.604)	(0.338)	(0.204)
EQ^4	0.012**	0.030***	0.018*
	(0.023)	(0.000)	(0.072)
Adj. R^2	0.28	0.41	0.26
Obs.	163	160	157
Panel E:			
FRD_SR	-0.0002**	-0.0002	-0.0002
	(0.047)	(0.127)	(0.302)
EQ^4	0.013**	0.031***	0.017*
	(0.015)	(0.000)	(0.073)
Adj. R^2	0.29	0.42	0.25
Obs.	163	160	157
Panel F:			
FRD_QN	-0.001*	-0.002***	0.001
	(0.098)	(0.004)	(0.385)
EQ^4	0.013**	0.032***	0.016
	(0.013)	(0.000)	(0.102)
Adj. R^2	0.30	0.44	0.25
Obs.	163	160	157
Panel G:			
FRD_QL	-0.0001*	-0.0001	0.00003
	(0.053)	(0.131)	(0.806)
EQ^4	0.012**	0.030***	0.017*
	(0.018)	(0.000)	(0.084)
Adj. R^2	0.29	0.42	0.25
Obs.	163	160	157

Notes: variable definitions see Table 4.2. I report the coefficient estimates and *p*-values (in parentheses) obtained from ordinary least squares (OLS) regressions of *FCERROR* on detailed *FRD* and *EQ,* conditional on other factors expected to affect forecast accuracy. ***, ** and * indicate significance at 1%, 5% and 10% level respectively. Industry dummies are included in all specifications but not reported in this table.

4.7. Conclusion

To the best of my knowledge, the present research may represent the first attempt to gain a deeper understanding of the relationship between forward-looking risk disclosures, earnings quality and analyst forecast accuracy. I use a coded index to count *FRD* in the narrative sections of annual reports and also seek to disaggregate the total number of *FRD* into various subcategories from the perspective of risk content (financial risk, operational risk, and strategic risk), the nature of disclosures

(quantitative and qualitative), and the type of news (good/ bad). The results suggest a significant positive relationship between the extent of *FRD* disclosures and analyst forecast accuracy, and the lowering effect on forecast error appears strongest in the short-term horizon. The detailed risk construction also confirms the association identified for aggregate risk disclosure. This finding is consistent with Wang and Hussainey (2013) and Dhaliwal et al. (2012). In respect of earnings quality, I observe a significant negative association between earnings quality and forecast accuracy; these results are robust when I change to alternative *EQ* metrics. Further, I show *EQ* has long-term predictive power regarding earnings, with this earnings predictability declining when the forecast horizon increases. I also extend the earnings forecast literature by highlighting the complementary and simultaneous impact of *FRD* and *EQ* on forecast accuracy, consistent with Verrecchia's (1990) theoretical model that an increase in the quality of information on earnings available to mangers contributes to more disclosures on their part (i.e. they engage less in earnings management).

These findings have implications for regulatory bodies' efforts in encouraging firms to augment information quality, with the aim of motivating managers to meet earnings expectations. To the extent that investors incorporate analysts' earnings forecasts in their portfolio investment and respond to revisions of those forecasts, my results provide insights into understanding what role information risk plays in investors' decision-making.

One limitation of the present research is I collect *FRD* for a single year. I recognize the benefits of collecting data beyond a single time period to produce a panel of data; however, the time-intensive nature of this project applies inevitable constraints and so my analysis is cross-sectional only. I would therefore recommend a time-series analysis of *FRD* and its impact on long-term earnings forecast as an

avenue for future research; it would also be worthwhile to conduct separate research focusing on the modelling of the relationship between disclosure quality and earnings quality, and consider whether and how their simultaneous interactive relationship may explain time-series earnings predictability. Additionally, future research could shed light on the extent to which my results are applicable to other international settings.

Appendix 4.1[38]

Elements in *FCERROR* model:	
EPS1MN-Earnings per share mean FY1 for a company (*EPS2MN*, *EPS3MN*)	Mean value of all estimates for a company derived by the majority of contributing analysts for fiscal year 1. The arithmetic mean of estimates for the fiscal year indicated ($MFC_{i,t}^{Y}$) is calculated as follows: $$\frac{\sum_{i=1}^{n} x_i}{n}$$ Where: x_i = individual analyst's forecasts n = number of estimates
EPS1MD-Median value of all FY1 estimates for a company (*EPS2MD*, *EPS3MD*)	The value that falls in the middle of the defined range of estimates when arranged in ascending order. That is, the value within the sample that has an equal number of estimates both greater and less than itself. If the sample has an equal number of estimates, it is the average of the two middle values. Median values are less affected by outlier forecasts than mean values.
A##EPS-Actual annual EPS	Actual value for Earnings per share for year ending '##'
W05001-Market price year end	Represents the closing price of the firm's stock at their fiscal year end.
Elements in *EQ* models:	
WC02999-Total assets	Represents the sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets.
WC02201- Current assets total	Represents cash and other assets that are reasonably expected to be realized in cash, sold or consumed within one year or one operating cycle.
WC02005- Cash & cash equivalents generic	Represents Cash & Due from Banks for Banks, Cash for Insurance Companies and Cash & Short Term Investments for all other industries

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[38] Variable definition according to *DataStream*.

WC01001-Revenues	Represents gross sales and other operating revenue less discounts, returns and allowances.
WC03101- Current liabilities total	Represents debt or other obligations that the company expects to satisfy within one year.
WC02301- Property, plant and equipment gross	Represents tangible assets with an expected useful life of over one year which are expected to be used to produce goods for sale or for distribution of services.
WC03051- Short term debt & current portion of long term debt	Represents that portion of debt payable within one year including current portion of long term debt and sinking fund requirements of preferred stock or debentures.
WC01151- Depreciation, depletion and amortization	DEPRECIATION represents the process of allocating the cost of a depreciable asset to the accounting periods covered during its expected useful life to a business. It is a non-cash charge for use and obsolescence of an asset. DEPLETION refers to cost allocation for natural resources such as oil and mineral deposits. AMORTIZATION relates to cost allocation for intangible assets such as patents and leasehold improvements, trademarks, bookplates, tools and film cost.
WC01551- Net income before extra items	Represents income before extraordinary items and preferred and common dividends, but after operating and non-operating income and expense, reserves, income taxes, minority interest and equity in earnings.
WC02051- Receivables	Represents the amounts due to the company resulting from the sale of goods and services on credit to customers (after applicable reserves).

Notes: appendix explains the codes I use to obtain data from *I/B/E/S* and *DataStream* to compute *FCERROR* and *EQ*: (numerical figure 1, 2, 3 in the column refers to fiscal year (*FY*) 1, 2, 3 data type, in my sample refer to fiscal year 2011, 2012 and 2013 respectively). Descriptions are consistent across all fiscal years.

Chapter 5

Conclusion

5.1. Summary of the findings

This thesis represents the first attempt, to the best of my knowledge, to obtain a deeper understanding of firms' forward-looking risk disclosure patterns, and their determinants from the perspective of corporate governance issues and ownership structure, and impact on firm risk and analyst forecast accuracy. In order to test these relationships, I manually coded a sample of non-financial institutions that were members of the FTSE100 and Mid-250 indices during 2010, as identified by Thomson Reuters.

One of the main findings of the present research is the significant role that corporate governance characteristics play in explaining the extent of firms' forward-looking risk disclosure. All the three board attributes: Board composition (measured by the proportion of non-executive directors on a board), board independence (measured by the proportion of independent directors on a board), and board size are

significant positively associated with the level of forward-looking risk disclosures. The composite measure of audit committee effectiveness (defined here as audit committee independence, size, expertise and commitment) shows equal importance regarding improved risk disclosure as board characteristics. These findings are consistent with the hypothesized theoretical benefits of effective corporate governance, and provide empirical evidence to bolster the arguments for improvement to UK corporate governance structure. Conversely, share holdings by investment institutions and inside employees are negatively related to forward-looking risk disclose. These results support the argument regarding proprietary costs, in that institutional shareholders (often characterized by their large, stable ownership position) and inside employees (defined as those strategic shareholders of 5% or more who are employees, or individual investors) have better access to insider information about their portfolio companies; therefore disclosure is less important in monitoring firms and profitable trading opportunities could be lost if more disclosures provide an alternative resource for inside information. Collectively, the findings would account for the lack of disclosures in those companies embroiled in accounting scandals: Non-effective corporate governance structures that cause poor monitoring by the informed executives, and inappropriate shareholding structures which enable senior executives to focus on short-term profits whilst sowing the seeds of future crises.

In respect of the impact of forward-looking risk disclosure on firm risk, I reports a significant negative association between the total quantity and level of firm risk; however, one standard deviation increase in forward-looking risk disclosures only leads to a slight decrease of the beta value. This supports stake-holder agency theory in that if managers selectively publish limited forward-looking risk

information, and therefore fail to meet the requirements of external stakeholders, investors may consider the company a risky investment because this might later incur costly explicit claims (i.e. a risk of litigation). Additionally, stakeholders may perceive an inefficient level of internal risk control and a restricted ability of managers to obtain financing resources at consistent rates (Salama et al., 2011). The detailed risk construction allows I to present some additional evidence on different categorises of forward-looking risk disclosure in relation to their impact on risk reduction. Specifically, the present results indicate that disclosing more forward-looking operational risks helps drive down firm risk levels in a more effective way. This is consistent with prior literature that has suggested institutional investors place more value on firm-specific risks than on general market risks which all firm would confront. In addition, the more 'good news' and quantitative news that is forward-disclosed, the stronger the effects on reducing firm risk. These results support the resource-based view and quality signalling theory, which suggest that one way to improve the quality of firms' risk disclosure is by increasing the release of operational, 'good news' and quantitative risk information. Such disclosures are less easily replicable for weaker opponents, and transmit valuable, rare, inimitable and non-replicable risk management superiority signals to potential investors.

In respect of the impact of forward-looking risk disclosure on analyst forecast accuracy, I reports a significant positive relationship between the extent of forward-looking risk disclosures and analyst forecast accuracy; the reduction effect on forecast error appears strongest in the short-term horizon. The detailed risk construction also confirms the association identified for aggregate risk disclosure. This finding is consistent with the disclosure studies of Wang and Hussainey (2013), Dhaliwal et al. (2012) and Dorestani and Rezaee (2011) which examine forward-

looking disclosures, corporate social responsibility disclosures, and key performance indicator disclosures respectively. In testing the relationship between forward-looking risk disclosure and analyst forecast accuracy, I also controls for earnings quality, as this is another commonly-used proxy for information risk and is widely referenced as a determinant of earnings predictability. I also finds a significant negative association between earnings quality and forecast accuracy; the results are robust when using alternative earnings quality metrics. Further, I shows earnings quality has long-term predictive power regarding earnings, with this earnings predictability declining when forecast horizons increase. The present study also extends the earnings forecast literature by highlighting the complementary and simultaneous impact of forward-looking risk disclosure and earnings quality on forecast accuracy, consistent with Verrecchia's (1990) theoretical model that an increase in the quality of information on earnings available to managers contributes to more disclosures on their part (i.e. they engage less in earnings management).

5.2. Implications of the study

One of the main findings in this study is the significant role that the board plays in explaining variation in UK firms' risk disclosures. Both the independence of the board and the activity of the board are associated with improved risk disclosure. While these findings are consistent with the hypothesized theoretical benefits of board independence and activity, this study provides an empirical validation of this and helps bolster the arguments for improvements to UK board structure. Greater board independence and greater board activity (board size and audit committee effectiveness) are recommended to help improve risk disclosure. I also find evidence

that shareholdings by inner employees plays a significant role in determining forward-looking risk disclosure. This further stresses the value of monitoring role played by shareholders. Due to their stable and lasting shareholding and non-conflict interests with firm's finance divisions, these inner investors are likely to pressure the board to release incomplete and segmented risk information as those privately held information can be too costly. This shareholding structure in a firm might weaken the monitoring role played by shareholders, which market makers want to change to enhance the disclosure quality as to serve the general information receivers.

This study represents the first attempt to gain a deeper understanding of the relationship between forward-looking risk disclosures and firm risk (proxied by systematic risk). Evidence of the effect of disclosure within the annual reports on capital market (assessed by cost of equity capital) is tenuous, and in the few studies that intend to address this issue including Botosan (1997) and Francis et al. (2008), mixed evidence are presented. While previous studies typically focus on integrated data panel (total disclosure quantity), this study has comprehensive construction of risk disclosure measures: I test whether the business focus of disclosure (financial, operational, strategic risk) would impact on the effect of voluntary disclosure on firm risk reduction; I also test whether the disclosure tone (good news, bad news, neutral news) and numerical nature (quantitative, qualitative disclosure) would affect the hypothesized relationship. This provides in depth empirical evidence that is distinct from prior research on understanding the content of disclosure on reducing firm's market risk. Results imply that investors value more about 'operational', 'good news' and 'quantitative' risk disclosures that are forward-looking, which suggest firm's executives an applicable way of improving investors' confidence through voluntarily releasing more of those risk disclosures.

This study also provides a detailed and forensic examination of how narrative risk disclosures with a future horizon aid market participants (financial analysts) in their assessment of future corporate performance (earnings). Prior officially published documents (ICAEW, 1998, 2000, 2002) raised the concerns regarding narrative risk disclosure deficiencies and urged UK firms to disclosure risk-related information in more depth. More than a decade later there are still major concerns regarding the usefulness of risk disclosures, with a recent UK survey by Abraham and Shrives (2014) characterising many of these disclosures as little more than 'symbolic window dressing'. As there is limited evidence of which forms of risk disclosures are most useful to professional users of accounts (e.g. analysts), this study intend to address this issue directly via an empirical examination of how different types risk disclosures aid financial analysts in their assessments of future corporate earnings. From these results I draw inferences regarding the relative usefulness of risk disclosures to the users of accountings, from which I derive some tentative suggestions which may aid accounting standard setters in better focusing their guidelines to company executives. Several recent studies on narrative disclosure, for example corporate social responsibility disclosures by US firms by Dhaliwal et al. (2012) and forward looking disclosures by UK firms by Wang and Hussainey (2013) provide evidence that narrative disclosures help market participants to better anticipate future earnings. These conclusions are based on evidence from stock price changes rather than a direct examination of earnings forecasts. The increased insight into future earnings numbers is inferred rather than being directly observed. This research contribute to the literature on narrative disclosures in providing evidence that forward-looking risk disclosures can aid analysts in their assessment of future earnings. The importance of forward-looking

narratives reiterates the findings of Wang and Hussainey (2013) but this research provides a direct link between these disclosures and analysts' earnings forecasts rather than merely inferring such insight from studying share price movements. By focusing directly on analysts' forecasts it shows that the utility of forward-looking risk disclosures relate to one-year-ahead forecast horizon only. On average, such disclosures provide insignificant improvements in longer term earnings forecast. Disaggregating Total into different subcomponents reveals many interesting findings: financial risk disclosures have the strongest impact on reducing forecast error. Strategic risk disclosures are also associated with significantly reduced forecast errors, although the slope is smaller than for financial risk disclosures. However, operational risk disclosures exhibit no significant explanatory power. This has some intuitive appeal. Strategic disclosures help understand how a firm will develop while operational disclosures help understand how a firm has developed. This finding makes a linkage with Arnold and Moizer's (1984) identification of information that is provided by firms (or sought by analysts) to aid the understanding of the financial statements. It also provides direct empirical support for Coram et al.'s (2011) survey findings that analysts value financial disclosures most when they are shedding light on bad news events.

The examination of the disclosure tone and numerical nature of forward-looking risk disclosures reveal that more good news and quantitative risks disclosed can significantly improve forecasting accuracy. Which is consistently with the findings in Chapter 3. This research provides a detailed insight into understanding what types of voluntary risk disclosures are most helpful to investors and financial analysts with regard to forecasting future earnings. It can be recommended that relevant accounting bodies encourage a forward-looking risk disclosures section with

the focus on financial and strategic risk disclosures, and testable favourable and quantitative risk disclosures. This study also provide managers with clearer guidelines as to precisely what types of forward-looking risk disclosures to include in their annual reports, for the benefit of analysts and investors. This guidance could be issued almost immediately and would not require time for 'bellwether companies' to change their practices and to then for other firms to 'feel obliged to mimic their behaviour' (Abraham and Shrives, 2014, pp.104).

5.3. Limitations of the study

The sample in this thesis relates to one year and so my focus is on explaining cross-sectional variation in forward-looking risk disclosures. Time-series trends in disclosure are not considered. This approach is typical of empirical studies analysing risk disclosures (Botosan, 1997; Linsley and Shrives, 2005, 2006; Abraham and Cox, 2007) and means that the sample is free of variations in disclosure that are the result of changing regulations or political environments. Given the time-intensive nature of the data collection in this study (manual), a time-series dimension is not a practical option. Another limitation is the adoption of a manual content analysis approach; thus, subjectivity is unavoidable. I thus uses UNIX perl code to assist with manual coding, which greatly decreases the subjectivity of content analysis. The combination of manual and computer-assisted content analysis provides a testable framework for future risk disclosure studies. The present research examines the quantity of forward-looking risk disclosures using sentence-counting, which is consistent with the majority of disclosure studies. Although, over the years, researchers have indicated that the quality of disclosures is more valuable than their

quantity, disclosure-quality research is still very much in its infancy mainly due to lack of consensus regarding the assessment of the quality of risk reporting (traditional approaches include some form of disclosure checklist, professional institutions disclosure quality ranking). This may also be a limit of the present research.

5.4. Recommended avenues for future research

I recommend the following avenues for future research:

A longitudinal or time-series analysis of forward-looking risk disclosures and their impact on future measures of uncertainty and risk, with additional examination of potential interaction of these variables over time.

A series of structured and semi-structured interviews with preparers of accounts, to investigate the incentives and inhibitions that determine the extent of risk disclosure and their informativeness to users of accounts.

Comparative cross-country studies of risk disclosure approaches. These will be of particular value. When conducting investigations in other countries, however, attention must be paid to legislation requirements and accounting standards and cultural attitudes (as well as translation issues) that might have potential influence on firms' risk disclosure.

Research that investigates forward-looking risk disclosure within specific industries might also bear considerable results. Future work could also be undertaken to examine whether the results of this research are replicable for financial institutions.

Further development of the use of multi-equation frameworks to assess the determinants of disclosure, perhaps employing new variables and models to measure firm risk and earnings predictability.

Application of the insights provided in this thesis to other disclosure studies, such as corporate social environmental disclosures, compulsory financial statements, and specific corporate governance disclosures, to test whether results are replicable.

Future research using modelling approaches to measure risk disclosure quality will be of particular value.

Risk information could be collected from a variety of sources including firms' websites, financial analysts' reviews, media reports, regulators' statements, etc., rather than exclusively based on corporate annual reports.

"Technological innovation, changes in the business economics of audit firms and analysts, globalization of capital markets, and changes in disclosure channels and the number and type of information intermediaries continue to reshape disclosure and financial reporting practices" (Kothari, Li and Short, 2009, pp. 1667). Future risk disclosure studies could test these factors as determinants of the disclosure approaches of individual firms.

The data collection technique adopted in this research is a combination of manual content analysis and UNIX pearl code, which is argued to greatly reduced subjectivity in the coding process while increase the credibility of tested data. However, due to the time-intensive nature of this methodology, it is generally impractical to be applied to more time-line researches. Therefore, future research could reply on NVIVO that count the frequencies of key words, or profasional

database such as: annual filings in the SEC's Electronic Data Gathering Retrieval (EDGAR) database, to see whether in time-series tests the results obtained in this research still holds.

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