Developing the Narrative Risk Disclosure Measurement

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Purpose- This study adopts the pre-modern view of risk as losses only and proposes a new definition of corporate risk disclosure. The new definition is used to formulate new risk-related keywords to develop the process of measuring the risk disclosure score.

Design/methodology/approach- The theoretical part of this study reviews the different methods of measuring narrative disclosure in literature, discusses five arguments on why risk should be defined as losses only, and proposes a new definition of risk disclosure. The empirical part conducts two tests on a sample of 150 annual reports of UK firms during 2005-2015, formulates new keywords lists, measures RD score from different perspectives, and run correlation and regression analyses for 328 non-financial FTSE All-Share listed firms during 2005-2016, the effect of RD was examined on cost of debt and market firm value one year ahead.

Findings- The first empirical test shows that about 94% of risk information in annual reports is talking about risk from a negative perspective and negative outcomes only. The second test shows that 87% of the risk-related sentences in the annual reports discussing risks using negative keywords. The descriptive statistics show that the risk disclosure level is increasing across years during 2005-2015 and the utilities industry reports the highest level. The study concludes that the pre-modern view of risk should be adopted.

Originality/value- This study contributes to the ongoing debate on the risk definition and whether the positive outcomes of events should be included in the risk disclosure definition. Moreover, the study proposes a new definition of risk disclosure and provides theoretical and empirical evidence on why the pre-modern view of risk should be adopted. Moreover, new risk-related keywords are used for the first time in the risk disclosure literature.

Keywords: Risk; Risk Disclosure; QSR; Annual Report; UK

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1. Introduction

Corporate financial reporting is the accounting product that facilitates communication between managers and all stakeholders. Investigating the determinants and value-relevance of the financial reporting and its different categories is one of the most important research topics in financial accounting. Investigating the determinants of disclosure, especially that is provided on a voluntary basis, could help in understanding the drivers of disclosure quantity and quality, while investigating the disclosure value-relevance helps to recognize its gains and economic feasibility compared with its costs. However, measuring the disclosure quantity and quality is a basic step in disclosure studies.

The narrative disclosure measurement is a critical issue in the disclosure literature that is conducted by several and different methods. Some researchers measure narrative disclosure by counting the number of relevant words or sentences (e.g., Linsley & Shrives, 2006; Rajab, 2009; Dobler et al, 2011; Ntim et al, 2013; Elshandidy et al, 2013; Mokhtar & Mellett, 2013), while others constructed an index to measure the disclosure level (e.g., Botosan, 1997; Mokhtar & Mellett, 2013; Lipunga, 2014). A few researchers used a dummy variable such as Iatridis (2008) and El-Gazzar et al. (2011). Moreover, authors found to depend on ready ratings of disclosure as proxies for disclosure quantity or quality, such as Welker (1995), Healy et al. (1999), and Gelb and Zarowin (2002), while a few found to used surveys and interviews, such as Frolov (2006) and Tauringana & Chithambo (2016). However, counting the number of sentences seems to be the most common method. In measuring Risk Disclosure (RD) level, most RD studies found to prepare lists of keywords that express any kind of risk then use these keywords to count the number of risk-related sentences, such as Linsley & Shrives (2006), Abraham & Cox (2007), Linsley & Lawrence (2007), Greco (2012), and Ntim et al. (2013).

This study aims to develop the measurement of the narrative RD for two reasons. First, the sensitivity and importance of risk information. Second, the ongoing debate on the definition of risk and whether the positive outcomes should be included in the risk definition. The study argues that RD could be very important compared with other reporting categories. Risk information is important since it discusses the present and potential risks and uncertainties that could threaten the continuity of business. Moreover, RD could have important investment, financing, and liquidity implications by reducing agency and information asymmetry problems (Abraham and Cox, 2007; Ntim et al. 2013). Campbell et al. (2014) find that higher RD level is negatively associated with information asymmetry and stock return volatility.

On the other hand, the value-relevance of RD is recognized and promoted by different accounting boards and bodies, such as Institute of Chartered Accountants in England and Wales (ICAEW) in the UK, the International Integrated Reporting Council (the IIRC), and German Accounting Standard Board (GASB) in Germany. ICAEW issued a series of reports that encourage managers to develop corporate reporting, especially the corporate RD, starting from ICAEW 1997 report to the most recent report; ICAEW (2017) "What's next for corporate reporting: time to decide? Moreover, the IIRC (2013) states that an Integrated Report should include eight content elements including risks and opportunities, whereby company should report on what are the specific risks and opportunities that affect their ability to create value and how they deal with them? In addition, the German Accounting Standard Board (GASB) issued GAS 5 "Risk Reporting in Germany in 2001, which is considered the first comprehensive risk reporting standard around the world. On the literature level, the importance of RD was examined several years ago. For example, Solomon et al. (2000) is one of the early studies that tried to present a conceptual framework for corporate RD and examine the attitudes of investors towards risk information in the UK. The study provides empirical evidence that institutional investors admit that higher RD level would help in making the portfolio investment decisions.

Before measuring RD, it is important to define "risk information" precisely, and before that we should identify what we mean by the word "risk". The risk has been defined in the literature from different perspectives. The literature provides the one-side view, the two-side view, and the variation view of the word "Risk" (Linsley & Shrives, 2006; Abraham & Cox, 2007; Elshandidy, 2011). Whether to include the positive outcomes into the risk definition is debatable in the RD literature. Accordingly, this study discusses this debate and presents its own definition of RD.

This study contributes to the ongoing debate on the definition of risk information as follows. First, the study presents five theoretical arguments on why RD should be defined from the negative side only. Second, the study conducts two empirical tests that confirm these arguments. Third, the study proposes a new definition of RD that is consistent with the pre-modern definition of risk that should be adopted by researchers. Fourth, the study generates new risk-related keywords to be used to measure RD level and are consistent with the proposed definition and the pre-modern view of risk.

The remainder of this study proceeds as follows. Section two reviews the narrative disclosure measurement in literature. Section three discusses the different concepts of risk and RD definitions. Section four discusses five theoretical arguments on why RD should be defined

from the loss side only. Section five presents two empirical tests that support the study view of RD and presents a new definition of RD. Section six presents keywords lists to measure RD while section seven presents the descriptive statistics of RD scores across years and industries and in total. Finally, section eight discusses the validity tests and the study implications while section nine concludes.

2. A Review of Narrative Disclosure Measurement

Hassan & Marston (2010) classify the approaches of measuring narrative disclosure into two main approaches. The first approach examines disclosure by directly inspecting the disclosure means, such as annual reports. This includes counting the disclosure, constructing indices, and using dummy variables. For example, Linsley & Shrives (2006), Hill & Short (2009), Elzahar & Hussainey (2012), Miihkinen (2012), Ntim et al. (2013), and Marzouk (2016) applied the content analysis to measure the RD directly by inspecting its level and attributes in annual reports. The second approach inspects indirectly the corporate disclosure without returning to the original disclosure means, such as conducting disclosure surveys and interviews with market participants to collect references about disclosure and their perceptions, such as surveys as conducted by Frolov (2006). Figure (1) shows six direct and indirect methods and two main techniques used in literature to measure disclosure.
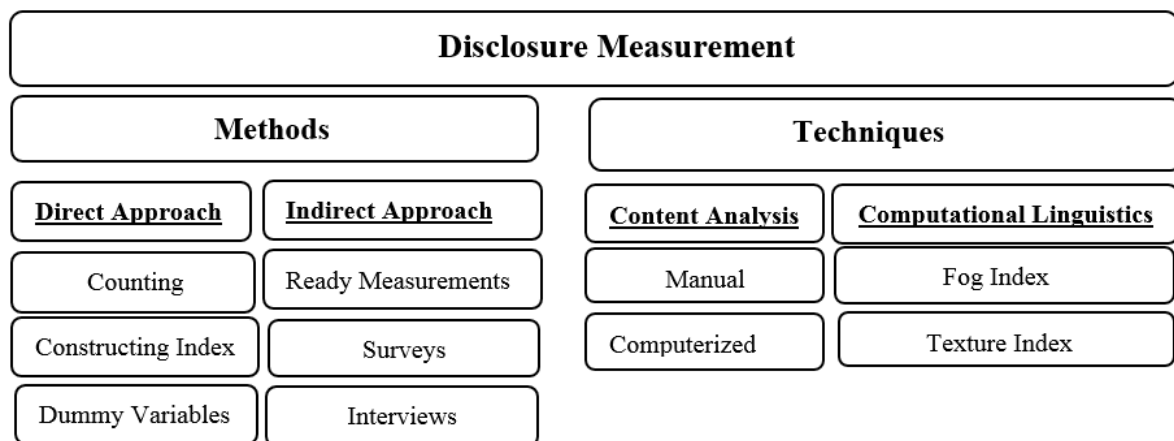

Fig. (1): Methods & Techniques of Disclosure Measurement

2.1 Counting the Narrative Disclosure

Counting is a direct method of measuring the narrative disclosure. Although it seems a primitive method, it is effective when measuring the quantity rather than the quality. The disclosure level is measured simply by counting the risk-related words or sentences before

transforming this number into a natural logarithm. Many studies such as Linsley & Shrives (2006), Abraham & Cox (2007), Hill & Short (2009), Elzahar & Hussainey (2012), Miihkinen (2012), and Ntim et al. (2013) found to follow this method.

The coding (measurement) unit may be a word, sentence, paragraph, a part of page, or the whole page. According to Helbok & Wanger (2006), Copeland & Fredericks (1968) introduced counting the disclosure using the word as a measurement unit. However, the word as a measurement unit is criticized since the word meaning relies on its syntactical role within the sentence and the word by itself does not convey a meaning (Milne & Adler, 1999; Linsley & Shrives, 2006; Hassan & Martson, 2010). Moreover, using insufficient or improper words could over- or underestimate the counted disclosure level (Hassan & Martson, 2010). Moreover, Moumen et al. (2015) argue that risk-related words cannot be categorized into different risk categories before reviewing the sentence. Some studies found to use the word as a measurement unit such as Miihkinen (2012), Campbell et al. (2014), and Filzen (2015).

On the other hand, Milne & Adler (1999) and Linsley et al (2006) argue that measuring RD level using sentences rather than words or pages is a more reliable coding method. Elshandidy & Neri (2015) argue that using the sentence as a coding unit in the content analysis is more reliable because words may not imply any meaning individually. Further, Kravet & Muslu (2013) argue that using the sentence as a coding unit helps to void double-counting, as if the sentence contains several risk-related words, it is scored once. Milne & Adler (1999) argue that sentences as measurement units provide meaningful, complete and reliable data. Finally, although counting is a direct method to measure disclosure, it may not be effective in evaluating the quality of disclosure. Moreover, this method is time-consuming and requires an amplified effort, unless the computerized content analysis is employed.

2.2 Constructing an Index

Another direct method to measure the disclosure is by constructing a disclosure index through three steps. First, the authors prepare a checklist of certain disclosure items. Researchers usually depend on existing accounting standards or regulations or even prior studies when constructing a checklist of disclosure items. For example, Mokhtar & Mellett (2013) prepare a mandatory RD checklist based on the Egyptian Accounting Standard 25 "Financial Instruments: Presentation & Disclosure". Lipunga (2014) constructs RD index and disclosure checklist of 6 risk groups that are constructed according to Pillar 3 of Basel 2 Accord. Moreover, Atanasovski (2015) depends on the requirements of IFRS 7 to construct RD checklist, while Habbash et al. (2016) construct a checklist of voluntary disclosure items

depending on studies of Meek et al. (1995) & Botosan (1997). Second, the authors examine whether each checklist item is disclosed or not in the disclosure report following a certain coding scheme. Beattie et al. (2004) state two coding schemes, the simple binary method whereby the existence or absence of a disclosure item is investigated and values of one and zero are used, while the ordinal coding scheme could incorporate more than two values, like the three levels coding scheme used by Botosan (1997). Third, authors sum the scores given to each firm-year observation, and then divide this score by the maximum index score to represent the level of actual disclosure and the value of disclosure index. Some studies have used more than one index to measure RD from different perspectives. For example, Beretta & Bozzolan (2004) used four indices to measure RD; the first measures RD as the standardized residuals of a regression model, the density index measures RD as the ratio of risk-related sentences to the total number of sentences, the depth index measures RD based on the sign of the economic impact, while the fourth index measures RD based on the extent to which the companies disclose information on actions taken to face the potential risks.

Overall, this direct method to measure disclosure is very effective, especially if the objective is to examine the compliance with disclosure regulations, where the checklist could contain the disclosure items as imposed by the disclosure standard or regulation, and researchers can examine to what extent these items are disclosed by the sample companies. Moreover, to be a good indicator of disclosure level, the items included in the checklist should be adequate and cover the different aspects of disclosure under investigation.

However, this method has some limitations. First, it should be emphasized that scores of the disclosure indices are not necessarily measures of disclosure quality. Second, using self-constructed indices to measure disclosure is very labour-intensive, subjective, expensive, and feasible only for small samples (Core, 2001; Beyer et al. 2010; Berger, 2011). Botosan (1997), Linsley & Shrives (2006), and Abraham & Cox (2007) argue that using a disclosure index requires subjective assessments. To minimize the potential subjectivity, authors follow certain tests to confirm the validity and reliability of their results, such as involving an additional independent person to read, code and evaluate the examined document. Using the computerized content analysis may alleviate some of these limitations. Several authors such as Hussainey et al. (2003), Kothari et al. (2009), Gruning (2011), Elshandidy et al. (2013), Elshandidy et al. (2014), and Elshandidy and Neri (2015) apply the computerized content analysis.

2.3 Dummy Variable

Using a dummy variable is another method to differentiate between disclosers and non-disclosers or providers of high-quality disclosure and those of low-quality disclosure. Iatridis (2008) used a dummy variable that is devoted to one if a company is a provider of high-quality information and zero if it is a provider of low-quality information. El-Gazzar et al. (2011) used a dummy variable that equals one if a company found to report on the weaknesses of internal control and zero otherwise. However, Sun (2015) depended on the auditor opinion, where the disclosure variable equals one if the auditor opinion on internal control was adverse and zero otherwise. It sounds that this method is not empirical and does not provide an in-depth understanding of disclosure quantity, quality, and attributes; just it helps to differentiate between disclosers and non-disclosers. Moreover, it is not popular in the disclosure literature.

2.4 Ready Disclosure Measurements

Some authors found to direct to ready measurements of disclosure published by professional or academic bodies, or even prepared by prior studies. For example, the Association of Investment, Management and Research (AIMR) in the USA used to provide ratings of disclosure, known as AIMR ratings, to encourage and improve corporate disclosure (Healy et al. 1999; Healy & Palepu, 2001; Beattie et al. 2004; Hassan & Martson, 2010). Authors found to depend on these ready ratings of disclosure as proxies for disclosure quantity or quality, such as Welker (1995), Healy et al. (1999), and Gelb and Zarowin (2002). However, the AIMR disclosure ratings were discontinued in 1997 (Core, 2001; Beyer et al. 2010; Berger, 2011). Other examples of ready disclosure measurements are the Standard and Poor's Transparency and Disclosure Scores and the SEC Ratings of the Management Discussion and Analysis Disclosure (Hassan & Martson, 2010). Moreover, some databases such as DataStream and Bloomberg provide researchers with prepared scores for certain types of disclosure such as Environmental Disclosure (Field, RX374), Social Disclosure (Field, RX375), and Governance disclosure (Field, RX376).

2.5 Surveys & Interviews

Conducting surveys or interviews is another indirect method to recognize the disclosure level and attributes. Basel Committee conducted three surveys in 1999, 2000, and 2001 across 13 countries to examine the RD practices in the banking industry. Further, Frolov (2006) conducted a survey in Japan to examine the RD practices in a sample of banks and credit institutions. Riley & Taylor (2015) depend on the experiment and online survey to evaluate the

readability of disclosure on three risk factors. Tauringana & Chithambo (2016) conducted four personal interviews with four company managers. Further, Linsley & Shrives (2005), and Greco (2012) recommend conducting interviews with companies' directors and market participants to investigate the state of disclosure and to what extent it is value-relevant.

Although using surveys and interviews may be an easy method to measure disclosure than constructing labour-intensive disclosure indices, the disclosure measurement quality using these methods depends mainly on the quality of conducting the interviews and formulating the questions of surveys and to what extent the views of the interviewees are objective (Hassan & Martson, 2010). Moreover, despite the simplicity of this method, it is not popular, after reviewing the literature, only one study found to conduct interviews (Tauringana & Chithambo, 2016) and one found to conduct a survey (Frolov, 2006).

2.6 Techniques of Narrative Disclosure Measurement

The literature provides two main techniques to examine the disclosure narratives and measure the disclosure level: the content analysis and computational linguistics. The content analysis is the most common technique used to measure disclosure and may be the most valid and reliable technique (Linsley & Shrives, 2006; Abraham & Cox, 2007; Elzahar and Hussainey, 2012; Kothari et al. 2009; Elshandidy et al. 2013; 2015). Moreover, Krippendorff (2013) argues that content analysis ensures repeatability and valid references from the narratives. Furthermore, Gray & Haslam (1990) argue that content analysis is a valid and reliable means for measuring the disclosure, since it evaluates the disclosure without the knowledge of information providers.

The content analysis could be manual or computerized. The manual content analysis counts the disclosure level manually; however, this technique requires considerable effort and time and increases the measurement error. Some studies such as Linsley & Shrives (2006), Abraham & Cox (2007), Deumes (2008), Greco (2012), Elzahar & Hussainey (2012) and Elzahar et al. (2015) used the manual content analysis. On the other hand, the trend of using the computerized content analysis has increased during recent years due to the advances in computer technology. Another set of studies followed the computerized content analysis, such as Woods & Marginson (2004), Kothari et al. (2009), Gruning (2011), Ntim et al. (2013), Elshandidy et al. (2013), Elshandidy et al. (2015), Elshandidy & Neri (2015) and Hassanein (2015). The computerized content analysis is less subjective, and less time-consuming compared with the manual content analysis.

On the other hand, a set of studies recommends importing techniques of natural language processing from linguistics and artificial intelligence and incorporates in disclosure measurements, such as Core (2001), Beyer et al. (2010) and Berger (2011). Berger (2011, p. 216) state, "Natural language processing techniques represent one innovative way to capture broad aspects of disclosure and aspects of disclosure not readily measured by other means". Furthermore, Beyer et al. (2010, p. 312) state" …, we believe that analyzing disclosures using natural language processing techniques seems most promising in creating meaningful disclosure quality measures for large samples". However, despite the recent innovations in the computational linguistics, most disclosure researchers found to depend mainly on the content analysis and avoid using such advanced techniques. This may be due to the lack of experience of accounting researchers by the techniques of artificial intelligence and linguistics. However, future researchers can develop the disclosure measurement by involving specialists of linguistics in their empirical research.

Based on this review, this study contributes by developing the RD measurement using the counting method and new keywords after discussing the risk concepts and the RD definitions and introducing a new definition of RD.

3. Risk Concepts and RD Definitions

To determine whether a certain sentence or paragraph is a risk disclosure or not, it is important to recognize and define the risk meaning first. The concept of risk has developed from covering only the negative outcomes of events to covering both the negative and positive outcomes. The literature provides several concepts of risk that can be classified into one-side definitions and two-side definitions. For example, Lupton (1999) identifies risk as a hazard, threat, or harm, while Horcher (2005) defines risk as the possibility of loss. These authors recognize the risk as a loss or uncertainty with negative outcomes. Some disclosure regulations define risk as loss as well. For example, the SEC defines risk in FRR No. 48 in terms of loss (Hodder et al. 2001). German Accounting Standard (GAS 5) defines risk as the possibility of a negative influence on the economic position of the firm (Elshandidy et al. 2015).

However, the risk may carry the potential of either gain or loss (Schrand and Elliott, 1998; Solomon et al. 2000; Hodder et al. 2001; Mokhtar & Mellett, 2013) and therefore, it should be defined to cover the positive and negative prospects. Linsley & Shrives (2006) state that the modern view of risk incorporates both the negative and positive outcomes of events. Moreover, the ICAEW (2002) report *"No Surprises: working for better risk reporting"* states that risks have a range of different outcomes that could be upside or downside and therefore the institute

views that RD should cover business risks, threats, and opportunities as well. Furthermore, according to the international risk management standard (*ISO 31000:2009*), risk is defined as the influence of uncertainty on the firms' objectives that could be positive or negative. Moreover, FRS 5 defines risk as the uncertainty as to the amount of benefits. Practically, Abraham & Cox (2007) use risk in three contexts: risk as variation, risk as uncertainty, and risk as an opportunity. They use advantage, upside, prospect and potential as synonyms for risk as an opportunity. Hodder et al. (2001) consider both loss and probability in defining risk and consider dread, unknown and gains as three secondary factors of risk. Furthermore, Elshandidy et al. (2015) apply a definition for risk that includes both the potential gains or opportunities and potential losses. One of the early studies, Solomon et al. (2000, p. 449), defines the risk according to the modern view as "Risk may be defined as the uncertainty associated with both a potential gain or loss".

However, the risk could be defined also as a variation. Abraham & Cox (2007) and Elshandidy (2011) examined the risk as a variation. Elshandidy (2011, p.34), state "…, risk can be defined as the variations or fluctuations around a target value at a specific time horizon". Elshandidy (2011) states that he adopted this definition to avoid the debate on the risk definition. Moreover, Abraham & Cox (2007) examine the risk as a variation, uncertainty, and opportunity. This found to be consistent with the International Financial Reporting Standard (IFRS 4) - "Insurance contracts" that defines the financial risk as:

> "The risk of a possible future change in one or more of a specified interest rate, financial instrument price, commodity price, foreign exchange rate, index of prices rate, credit rating or credit index or other variable, …"

However, it is apparent from the literature review that when researchers examine RD, they consider the negative side of risk more than the positive one or a variation. This is consistent with the assumption of the prospect theory that people react to losses more severely than their reaction to gains (Hodder et al. 2001). Researchers seem to recognize and examine RD as dissemination of threats and dangers that face the firms rather than viewing some risks as opportunities. The ICAEW (2011) report *"Reporting Business Risks"* states that most RD practices focus on the risk in the negative sense and that people understand risk as the possibility of incurring losses or reduced profits or something else disadvantageous. The report (P. 3) state, "Most risk reporting in practice is about risk in the negative sense…".

In defining RD, Linsley & Shrives (2006, p. 389) provide a comprehensive definition of RD that covers both the positive and negative views of risks and states several synonyms of risk:

"…disclosures have been judged to be risk disclosure if the reader is informed of any opportunity or prospect or of any hazard, danger, hard, threat or exposure that has already impacted upon the company or may impact upon the company in the future or of the management of any such opportunity, prospect, hazard, harm, threat or exposure."

It is evident that this definition starts with the positive dimension by stating opportunity and prospect then follow to the negative dimension of risks. The definition states several synonyms of risk that makes it easy for RD researchers to use it as a guide in defining and measuring the quantity and the quality of RD. Subsequently, a large set of studies found to follow Linsley & Shrives (2006) and adopt their broader definition of risk, such as Rajab & Handley-Schachler (2009), Dobler et al. (2011), Elzahar & Hussainey (2012), Mokhtar & Mellett (2013), Ntim et al. (2013), Al-Shammari (2014), and Moumen et al. (2015).

Furthermore, Hassan (2009, p. 669) provides a broader and general definition of RD:

"…as the financial statements inclusion of information about managers' estimate, judgments, reliance on market-based accounting policies such as impairment, derivative hedging, financial instruments, and fair value as well as the disclosure of concentrated operations, non-financial information about corporations' plans, recruiting strategy, and other operational, economic, political and financial risks".

Hassan (2009) argues that his definition of RD coincides with several researchers' definitions of RD and communicates both the "good" and "bad" information and reporting on uncertainties. However, this definition is so general and does not determine the different synonyms of risks, compared with that provided by (Linsley & Shrives, 2006).

In total, the pre-modern view recognizes "risk" as something bad (negative outcomes), and the modernist view recognizes "risk" as both the negative and positive outcomes of events. *Whether to include gains and positive outcomes into the risk definition is still debatable in the RD literature*. Nevertheless, this study adopts the risk definition as a loss and proposes a new definition of RD that includes the negative outcomes only rather than both the positives and negatives. However, to justify this novel move in the RD literature, the study provides two pieces of evidence: theoretical and empirical evidence. The theoretical evidence consists of five theoretical arguments on why risks should be examined as negative outcomes only, and the empirical evidence is presented through testing how risk is defined and expressed in a sample of UK annual reports.

4. A Theoretical Evidence

This study adopts the pre-modern view of risk as a loss and measures the RD as negative outcomes only. This view is based on five theoretical arguments that justify why risk information should be examined as negative outcomes only.

Firstly, advanced RD regulations found to concentrate on the negative risk information disclosure, such as those of SEC in the USA, the German Accounting Standard (GAS 5), and Basel Committee risk regulations in the banking industry. For example, FRR No. 48 is one of the advanced RD regulations that issued in the USA in 1997. FRR No. 48 concentrates on disclosure of negative risks only (Hodder et al. 2001; Elshandidy, 2011). Hodder et al. (2001) state that FRR No.48 requires that managers disclose market risk information for risks of loss arising from adverse changes in interest rate, foreign currency rate, commodity prices, and equity prices. The subsequent updates of the SEC in December 2005 require firms to describe the most significant risk factors that may adversely affect the firms' business (Filzen, 2015). The SEC (2005, p. 260) regarding risk factors disclosure states, "…the risk factors disclosure would have required a discussion of the most significant factors with respect to the registrant's business, operations, industry, or financial position that may have *a negative impact* on the registrant's future financial performance". Furthermore, Filzen (2015) states that the SEC 2005 regulations impose penalties on firms that fail to disclose on the negative economic events.

Furthermore, the only extant comprehensive accounting standard of risk reporting (GAS 5) in Germany found to concentrate on the negative side of risk. GAS No. 5 defines the risk as "the possibility of future negative impact on the economic position of a firm" (Elshandidy, 2011). On the other hand, in the banking industry, the Basel committee issued several regulations to organize risk management and disclosure in banks. These regulations found to define the risk as a loss, such as Pillar (3) of Basel 2 Accord (2004; 2015), where the Basel Committee on Banking Supervision (2004, p. 149) defines the operational risk as "Operational risk is defined as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events". On the other hand, some guidelines on risk management and reporting found to differentiate between risk and opportunity and use the two keywords as carrying different meanings, such as the FRC (2014)'s report on risk management and reporting and the IIRC (2013)'s report of Integrated Reporting Framework.

Secondly, the definitions of the word "Risk" in different dictionaries and the definitions of different types of business risks are found to describe the negative side only. For example, the Concise Oxford Dictionary (2009) defines the risk as chance of hazard, bad consequences, loss or exposure to danger (Elshandidy, 2011). The Free Dictionary defines "Risk" as "The

possibility of suffering harm or loss". The Cambridge Dictionary defines "Risk" as "The possibility of something bad happening". The German Duden dictionary defines the "Risk" as a possible negative outcome for a company or a project, which is associated with disadvantages, losses, and damages (Elshandidy, 2011). Moreover, Hodder et al. (2001) argue that much of existing psychology literature defines the risk as a loss. Finally, Kaplan & Garrick (1981) and Adams (2009) define the risk as negative outcomes.

Thirdly, when searching for the definitions of a specific type of risk, such as operation risk or financial risk, the definitions found to mention the risk as a loss rather than a gain or opportunity. For example, Basel Committee on Banking Supervision (2004, p. 149) defines the operational risk as "Operational risk is defined as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events". Ntim et al. (2013, p.3) define financial risk as possible losses in the financial markets. Business risk is also defined as the possible losses that arise from the competitive skills that firms have and credit and liquidity risks that arise from failing to meet and discharge an obligation (Elshandidy, 2011). The default risk is defined in many places as the probability of being unable to repay the debt obligations. The business dictionary defines the environmental risk as "Actual or potential threat of adverse effects…". This indicates that the risk is defined socially and traditionally as negatives.

Fourthly, the studies that adopt the two-side definitions found to depend on negative keywords more than positive keywords. For example, Elshandidy & Neri (2015) used a list of 26 risk keywords before derivatives, only 6 words of this list are positive (chance, gain, high, increase, peak, viable). Moreover, Linsley & Shrives (2006) used 7 main keywords, only two could be positive (opportunity and prospect). Likewise, Abraham & Cox (2007) used 15 words before derivatives, only five of them are positive (opportunity, prospect, potential, upside, and advantage). This implies that when researchers adopt the two-side definition of risk, the counting of the risk-related sentences is biased toward the negative risk.

Finally, the users of financial reports are more likely to search for losses and threats when they are reading the risk sections. They usually understand risk in the negative sense of a possibility of incurring losses or reduced profits (ICAEW, 2011). Users do not expect to find information on opportunities or gains when managers disseminate any risk information. The prospect theory assumes that people react to losses more severely than their reaction to gains (Hodder et al. 2001). Users may become upset when finding many positive words inside a risk report or it could be understood as impression management. Not only the users of financial reporting expect risk information to be on losses, but also the preparers of such information are

more likely to concentrate on the negative side. ICAEW (2011) states that most risk information in practice is about risks on the negative side.

5. Empirical Evidence

Two tests have been conducted to examine a sample of UK annual reports to find out how "risk" is expressed in the annual reports' narratives, whether as negative outcomes only or as both negative and positive outcomes.

5.1 The First Test

Firstly, 3,608 annual reports have been collected for 328 non-financial firms listed on FTSE All-Share during 2005-2015. These reports were collected in PDF format from both Bloomberg and the websites of the firms. A sample of 150 annual reports was randomly selected and converted into Text Files. The randomly selected annual reports represent all the 9 industries excluding the financial firms' industry according to the ICB industry classification. Also, only one report was selected for one company so more companies would be represented in the sample. Then, these Text Files were imported into QSR software. Next, I searched for the keyword "Risk" and did not tick the option "Whole word or Phrase only" to collect its derivatives, such as "Risky" and "Risks". The resulting file brings 7,723 risk-related sentences. Next, I randomly selected 100 sentences, which are listed in Table (1). Then, I with my co-author (Hussainey, 2004) read all these sentences individually to differentiate them based on their orientation whether loss or gain and loss. The 100 sentences are ranked into two Panels as shown in Table (1).

Panel (A) of the table shows the sentences that discuss the risk as a loss, while Panel (B) shows the sentences that discuss the risk as both loss and gain and others that we could not determine their tendency, because they are too general risk-sentences. The results show that 90 sentences out of 100 discuss the risk as a loss, while 6 sentences found to reveal negative and positive outcomes together, and 4 unclear sentences are too general to determine their tendency. If the unclear sentences are excluded, then the remaining sentences are 96. The ratio of sentences discussing risk as a loss is 93.75% (90/96) or 90% of the total sentences (90/100). This test provides empirical evidence that the preparers of annual reports when writing about risk information; they are more likely to express the risk information as negative outcomes only, which is consistent with the pre-modern view of "risk" as a loss only.

Insert Table (1) about here

5.2 The Second Test

The first test brings a text file of 7,723 risk-related sentences. To conduct the second test, this file is imported into QSR. Then, the negative and positive keywords used in literature are searched for, such as Linsley & Shrives (2006), Abraham & Cox (2007), Elshandidy et al. (2013 & 2015), and Elshandidy & Neri (2015). This test helps count the number of sentences that include negative keywords and the number of sentences that include positive keywords out of the 7,723 risk-related sentences. Table (2) shows the examined keywords and their frequency. To balance the comparison, 10 negative keywords are compared with 10 positive keywords.

The results indicate that the total frequency is 2,804, where the positive risk keywords are repeated 364 times with a percentage of 13% of the total number, while the negative risk keywords included in the risk-related sentences are repeated 2,440 times, with a percentage of 87% of the total number. This result indicates that 87% of the risk-related sentences of the sample of 7,723 sentences discuss the risk as negative outcomes. This empirical evidence supports the result found in the first test, where 90% of the risk-related sentences found to discuss the risks as negative outcomes. Even after adding the 4 excluded keywords (unable, danger, shock, shortage), the results remain unchangeable.

Accordingly, based on the first and second tests, it can be concluded that the annual reports express risks as negative outcomes more than as positive outcomes, with percentages of 90% (Table 1) and 87% (Table 2), respectively. These results assert the study theoretical arguments that risk information should be examined as negative outcomes of events only.

Insert Table (2) about here

5.3 A New Definition of RD

According to the theoretical arguments and the results of the empirical tests, this study adopts the pre-modern view of risk as a loss only. This is consistent with the SEC regulations (FRR No. 48 and the subsequent updates in 2005 in the USA) that require managers to disclose on market risks as losses only (Hodder et al. 2001; Elshandidy, 2011). This is also consistent with the only comprehensive accounting standard of risk reporting (GAS 5) that defines the risk as negative impacts on the economic position of a firm. The loss definition is also consistent with the risk definition of several English Dictionaries, and consistent with most textbooks and dictionaries that define the different types of risks as negative effects.

Accordingly, this study introduces a new definition of risk disclosure that expresses risk information as losses only:

"Risk Disclosure can be defined as any information about the past, present, or potential loss, failure, collapse, crisis, deterioration, breakdown, accident, emergency, hazard, danger, harm, threat, or exposure that enables the present and potential users to identify and assess the current and potential negative outcomes for a business"

This definition is consistent with the pre-modern view of the risk as losses only. The definition considers the past, present and future negative outcomes and considers the present and potential users of information. Unlike the definition of Linsley & Shrives (2006) that includes both negative and positive keywords, this study definition includes negative keywords only. Unlike the definition of risk as a variation as measured by Abraham & Cox (2007) and Elshandidy (2011), the study definition excludes any keywords that express the risk as variations or fluctuations.

This definition needs to be applied in the study. Therefore, a set of steps are followed to generate a list of keywords that are consistent with the introduced RD definition. A list of new risk-related keywords is generated to measure RD level as a loss only under the symbol (*RD-Loss*). However, the study will also develop lists of keywords that comply with the other definitions of RD. The study will measure RD score based on the two-side definition of risk (*RD-LossGain*), measure the RD score as a variation (*RD-Variation*), and as a comprehensive measure (RD-Comprehensive). How to generate these keywords is explained in the following sections.

6. The Risk Keywords Lists

To choose the most suitable keywords, two steps are followed. First, an initial list is generated by reviewing the RD literature, the RD regulations and by searching on the synonyms of the existing keywords using the website http://www.thesaurus.com/. Second, a filtering process is conducted to create a final list depending on the frequency of the suggested keywords in the annual reports and whether they are used within the RD context.

6.1 The RD-Loss List (The one-side definition)

The one-side definition adopted by this study defines the risk as a loss only and focuses on the negative outcomes of events rather than opportunities, gains, or any variations or

fluctuations. To generate a list of the risk-related keywords that are consistent with this definition, the next steps are followed.

First, follow a certain risk classification. The risk classification provided by ICAEW (1997) and subsequently used by Linsley & Shrives (2006) is used. Table (3) shows six risk categories: *Financial Risk, Operation Risk, Empowerment Risk, Information Processing & Technology Risk, Integrity Risk, and Strategic Risk*. This step is important to identify the keywords that are more likely to appear when describing each risk category, so that the final list of keywords will ensure a comprehensive and more representative list of all common risk categories.

Second, suggest an initial list of keywords that are more likely to be used within each risk classification. To create this list, several sources discussing the different risk categories are reviewed: (1) examine a sample of 150 randomly selected annual reports using QSR and review all sentences containing the word "Risk", then the negative keywords used within these sentences are collected, (2) examine the keywords mentioned in IFRS 7, the UK Corporate Governance Code (2014; 2018), and the Basel Committee on Banking Supervision (2004) and BCBS (239), (3) review the academic and professional literature, such as Linsley & Shrives (2006), Abraham & Cox (2007), and the series of reports issued by ICAEW (1997; 1999; 2002; 2011), and (4) search for the synonyms of the collected risk-related keywords using the website http://www.thesaurus.com/

Third, generate a final list of keywords consistent with the risk definition as a loss. To do so, a filtering process for the suggested keywords is conducted through the next 3 stages:

a. Examine a sample of 150 randomly selected annual reports during 2005-2015 to check the existence and frequency of occurrences of the suggested keywords using QSR and exclude any keywords mentioned in less than 15 sentences. Elshandidy (2011) excluded all the words that did not appear in the search results of a sample of 15 annual reports per country. Hussainey et al. (2003) and Hussainey (2004) excluded any keywords that appeared in less than 30 sentences for a total sample of 60 analysts' reports. Following Elshandidy (2011)'s criterion will bring some keywords that are rarely used to discuss risks and are mentioned once or twice in this study sample of 150 reports, which does not make a sense to include them, such as punishment, dilemma, and cheat. If I followed the criterion of Hussainey et al. (2003) and Hussainey (2004), I would have to exclude keywords mentioned in less than 75 sentences (half the total number of 150 annual reports). However, this found to exclude some key risk words that are common in risk

reporting, such as danger, harm, bankruptcy, and contingency that are used by literature, such as Linsley & Shrives (2006) and Abraham & Cox (2007). In addition, some risk categories would be represented by a few keywords. I found a minimum of 15 sentences is enough, since the keywords mentioned less than 15 times seemed to be uncommon in the financial reporting (Hussainey, 2004), such as blood, radical, war, infection, virus, toxin, conspire, and violence. This first filtering stage brought an initial list of 70 keywords that are mentioned and repeated in 15 sentences or more in the sample of 150 annual reports.

b. However, some keywords found to be inconsistent with the definition of risk as a loss. The keywords *"fluctuation"*, *"variation"*, *"volatility"*, and *"change"* found to express financial risks, such as fluctuation of interest rates and commodity prices. They are consistent with the risk definition as a variation not as a loss. Therefore, they are excluded to ensure the non-interference between the three lists of keywords, where they will be included in the list of risk definition as variations. Furthermore, the keywords *"Risk"* and *"Uncertainty"* are used to express different meanings rather than a loss only. Risk can be negative or positive outcomes or a variation. Therefore, the two keywords are excluded.

c. During the third filtering stage, I used QSR to search for sentences of each keyword individually to ensure that the keywords are used within the context of risk information. I found five keywords used outside the risk-reporting context: "problem", "challenge", "serious", "complex", and "struggle", which are excluded. This final filtering stage brought a final list of 60 keywords.

Finally, following the procedures above generated a new list of 60 risk-related keywords that is considered a major contribution to the RD literature for the following reasons. First, the selected keywords are derived from the actual language and terminology used by the writers of annual reports to disseminate risk information. Second, the selected keywords are derived from the RD regulations (IFRS 7, UK CG Code, Basel Committee) in addition to the relevant academic and professional literature (e.g., Linsley & Shrives, 2006; ICAEW 1997; 1999; 2002; 2011). Third, the new list is a comprehensive, balanced, and more representative, since it includes keywords that represent six common risk categories, as shown in Table (3). Fourth, the suggested keywords are subjected to three stages filtering process. Finally, the selected risk keywords are consistent with the pre-modern definition of risk as adopted by this study.

6.2 The RD-LossGain List (The two-side definition)

Linsley & Shrives (2006, p. 389) adopt a broader definition of risk as both negative and positive outcomes. The definition contains both gains and losses but does not include any reference to variation or fluctuation, which makes it different from that adopted by Elshandidy (2011) and his following studies in 2013 and 2015. Linsley & Shrives (2006, p. 388) state, "…, the modernist view of risk incorporates both the positive and negative outcomes of events". Although the RD definition presented by Linsley & Shrives (2006) is followed by a large set of studies, such as Rajab & Handley-Schachler (2009), Dobler et al. (2011), Elzahar & Hussainey (2012), Ntim et al. (2013), Al-Shammari (2014), and Moumen et al. (2015), none of these studies found to clearly identify the complete keywords lists they used to capture the risk information from the annual reports. Besides, the definition of Linsley & Shrives (2006) is general and provides an opportunity for its followers to measure RD using different keywords. Accordingly, there is a need to identify precisely the keywords that should be used if the two-side definition of risk is adopted.

This sub-section identifies a list of risk-related keywords that are more likely to express both the negative and positive outcomes using the same steps followed above. Table 4 presents the initial and final lists. The initial list contains 30 positive keywords to represent the risk as positive outcomes. However, the initial list was reduced to only 15 keywords following the same screening criteria followed above. First, any positive keyword mentioned in less than 15 sentences is excluded. Second, six keywords found to be irrelevant are also excluded (outstanding, agree, possible, accept, peak, and viable) because they are used in a different context. Finally, the selected negative keywords are added to the selected positive keywords to generate a final list of 75 of both negative and positive keywords as Table 4 shows.

6.3 The RD-Variation List (The Variation definition)

Elshandidy (2011, p. 34) defines the risk as "…, risk can be defined as the variations or fluctuations around a target value at a specific time horizon". He used a final list that includes keywords that express the risk as variations, such as differ, increase, diversify, and fluctuate.

Afterward, Elshandidy et al. (2013), Elshandidy et al. (2015), and Elshandidy & Neri (2015) used the same keywords list with new keywords. Moreover, Abraham & Cox (2007) used the following keywords to express risk as variations: fluctuation, volatility, oscillation, and amplitude. The different market risks, such as exchange rate risk, the commodity risk, and interest rate risk, usually result from variations or fluctuations of the rates and prices. Furthermore, some methods of measuring risk are depending on variation measurements, such as standard deviation and variance (Clarke, 2003) or volatility of returns.

To generate a list of keywords to examine the risk as a variation, the same steps followed above are repeated. Table 5 presents the initial and final lists of the variation keywords. The initial list includes 24 variation keywords. Moreover, 11 keywords that are mentioned in less than 15 sentences are excluded. Additional six keywords are excluded because they are used in a context different from that of RD. These filtering procedures resulted in a final list of 7 keywords.

There are some confusing words, such as "increase", "decrease", and "decline", they can be used to express a positive or negative outcome or to express a variation happened for something. Henry (2008) discusses the problem of "Polysemy", which means that the meaning of the word may differ depending on its context. For example, the word "increase" could be used in the context "expenses increased", which gives a negative outcome, while the word "decrease" could be used in the context "expenses decreased", which gives a positive outcome. Moreover, these words could express a variation as well without causing any confusion. Whatever the context they are used within, they will express a kind of variation for something. Accordingly, the words "increase", "decrease", and "decline" are included in the variation keywords list.

Insert Table (5) about here

7. Descriptive Statistics of RD Score

In this section, the proposed RD definition and the proposed keywords are applied to measure the RD score using QSR software. To measure the score, the annual reports of 328 non-financial firms listed on FTSE All-Share index are collected in a PDF format for the period 2005-2015. The annual reports are collected from the Bloomberg terminal and the firms' websites. Then, these annual reports are converted into Text files and imported into QSR software. Then, a software command is run to measure the RD score based on the inserted keywords. Finally, the descriptive statistics are calculated using SPSS.

Tables (6) and (7) exhibit the minimum, maximum, mean, median, standard deviation, skewness and kurtosis of the measured RD scores as total and across the study years and across the different industries. As a total, Tables (6) and (7) show that the total number of observations with RD scores is 2,898 out of a total number of firm-years of 3,608, which indicates that 20% of the total sample is missing. This may be because some firms are listed on the London Stock Exchange (LSE) after the starting year of the study. For example, Gulf Marine Services PLC was listed on the 19th of March 2014.

Moreover, the total level of RD for RD-Comprehensive is the highest (mean = 356 in Panel D), followed by RD-LossGain (mean = 225 in Panel B), followed by RD-Loss (mean = 148 in Panel A), while the lowest mean (mean = 85) appears in Panel (C) for RD-Variation. These results are expected, since the number of keywords used to measure RD level differs significantly for each measure. The RD-Loss keywords list includes 60 main keywords without derivatives, the RD-LossGain keywords list contains 75 main keywords, the RD-Variation keywords list includes 7 main keywords, while the RD-Comprehensive list includes all keywords included in the prior lists in addition to the keywords "risk and uncertainty", with a total of 84 keywords. Therefore, the mean, minimum, and maximum values of RD-Comprehensive found to be higher, followed by RD-LossGain, RD-Loss, and RD-Variation. This is apparent also in Figures (2) and (3), where the yellow line (RD-Comprehensive) is the highest, followed by the orange line for RD-LossGain, followed by the blue line for RD-Loss, while the Gray line for RD-Variation comes at the bottom. Finally, the trend of RD level for the four RD scores found to be upward across years as shown in Table (6) and Figure (2), and the utility industry found to report the highest level of RD, while the technology industry found to report the lowest level as shown in Table (7) and Figure (3).

Insert Tables (6) and (7) about here

7.1 Descriptive Statistics of RD across the study years

Table 6 shows the descriptive statistics for the four RD measures across the years. As total, Panel (A) shows that the total mean of RD-Loss score is 148, with a minimum value of 21 and a maximum of 417, indicating that on average the annual report contains 148 risk-related sentences, while there are some annual reports that report up to 417 risk-related sentences and others that report only 21 risk-related sentences. This range implies that there is a large variation between the managers' decisions of the UK firms to disclose any risk-related

information. Unlike the USA and Germany, the RD is still provided on a voluntary basis in the UK. The trend to provide the RD in the UK on a voluntary basis is one of the main reasons for this variation. However, the range reported by Linsley & Shrives (2006) for a UK sample is smaller, where the minimum is 20 sentences and the maximum is 275 sentences. In addition, the mean found by Linsley & Shrives (2006) was 78 sentences, which is much lower than the mean of this study, which is 148 risk-related sentences. However, they examined just one and old year (2000). Moreover, Elzahar & Hussainey (2012) reported a mean of 28 risk-related sentences, a minimum of 5 sentences and a maximum of 110, for one year only between 1 June 2009 and 31 May 2010 in a UK sample. Al-Shammari (2014) examined Kuwait as a developing country and reported a mean of 20 sentences in 2012, which is much lower than 78 sentences reported by Linsley & Shrives (2006), and 148 as reported by this study. In addition, Rajab & Handley (2009) reported a mean of 93.50 sentences with a minimum of 28 and a maximum of 275 in 52 UK listed firms during 1998, 2001, and 2004. It is normal that the means vary between these studies due to differences in the sample size, the country, the study period, the risk definition adopted, the disclosure measurement method.

Across the years, Table (6) shows that the mean trend of the RD-Loss score is an upward trend, where the mean increases from 96 risk-related sentences in the year 2005 up to 180 risk-related sentences in the year 2015, with a percentage of 87.5%. This may back to the awareness increase by the importance of disclosure in general and in RD. Figure (2) shows upward trends not only for RD-Loss, but also for the four different RD measures. Panel (B) of Table (6) exhibits the descriptive statistics for the second RD score (RD-LossGain). The total mean for all study years is 225 with a minimum value of 36 and a maximum value of 607. This means that there are annual reports that contain up to 607 risk-related sentences based on the second measure of RD and others with a lower number of 36. The mean of RD-LossGain appears to increase gradually from 148 in the year 2005 up to 284 in the year 2015, with a change percentage of 92%. Panel (C) exhibits the descriptive statistics for the third RD score (RD-Variation), where the total mean is 85 with a minimum value of 8 and a maximum value of 85. The mean value found to increase gradually from 59 to 102 risk-related sentences between the years 2005 and 2015, with a change percentage of 73%. Finally, Panel (D) shows the descriptive statistics for -Comprehensive. The mean is 356, with a minimum value of 52 and a maximum value of 977. This indicates that there are some annual reports that contain 977 risk-related sentences. The mean values appear to increase gradually from 227 in the year 2005 up to 456 in the year 2015, with an increasing percentage of about 100%. Figure (2) shows upward trends for the RD level for the four different RD measures.

Figure (2): The Mean of RD Level across Years

The Mean of RD Level across Years	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
RD-Loss	96	111	115	139	153	154	154	154	174	174	180
RD-LossGain	148	172	176	205	223	227	233	238	269	274	284
RD-Variation	59	70	69	78	84	85	87	89	99	101	102
RD-Compreh	227	268	280	320	347	357	368	375	423	439	456
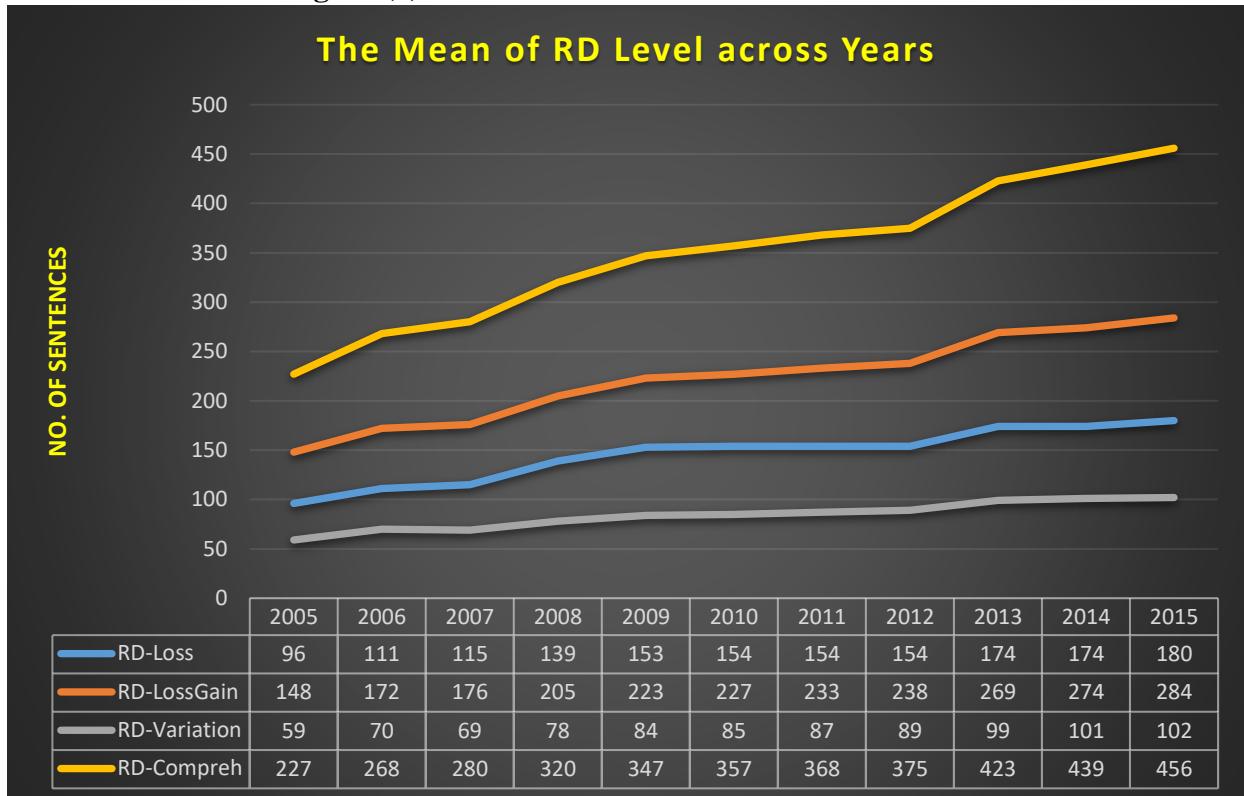
7.2 Descriptive Statistics of RD across industries

Table 7 shows the descriptive statistics for the four RD measures across industries. Panel (A) exhibits descriptive statistics for RD-Loss. It is evident that the utility industry presents the highest RD level with a mean of 212, followed by 193 for basic materials, while the technology industry presents the lowest RD level with a mean of 109 risk-related sentences. This implies that the annual reports published by the utilities companies contain 212 risk-related sentences on average, while those published by the technology companies contain 109 risk-related sentences on average. This range is not so much; however, it indicates a degree of variation between the managers' decisions of companies in different industries to disclose risk information. Panel (B) exhibits the descriptive statistics for RD-LossGain. The technology industry continues to show the lowest RD level with a mean value of 174 risk-related sentences, while the utilities industry continues to be the highest with a mean value of 311 sentences. Panel (C) exhibits the descriptive statistics for RD-Variation. However, the Basic materials industry comes at first this time and presents the highest RD with a mean of 120, followed by the utilities industry with a mean of 119, while the technology industry continues to be lowest with a mean value of 67 risk-related sentences. Finally, Panel (D) exhibits the descriptive statistics for RD-Comprehensive. The utilities industry again comes at the first with a mean

value of 486, followed by basic materials industry with a mean value of 445, while the technology industry comes at the end as usual.

To conclude, these differences in RD scores between the different industries are expected, since companies in different industries are subject to different operating conditions, different regulations and different risks. In the forward-looking disclosure context, Hassanein (2015) found the same result, where the utilities companies found to show the highest mean and the technology companies found to show the lowest mean and explained that this may be back to the high litigation in the technology industry, which makes companies provide less information disclosure. Finally, Figure (3) presents a clear view of the differences in RD levels between the different industries.

Figure (3): The Mean of RD Level across Industry

	Utilities	Basic Materials	Healthcar	Oil & Gas	Consumer Goods	Telecom	Industrials	Consumer Services	Technology
RD-Loss	212	193	175	154	147	133	144	134	109
RD-LossGain	311	276	264	254	225	207	220	208	174
RD-Variation	119	120	114	82	86	108	78	77	67
RD-Compreh	486	445	426	395	364	359	341	327	276
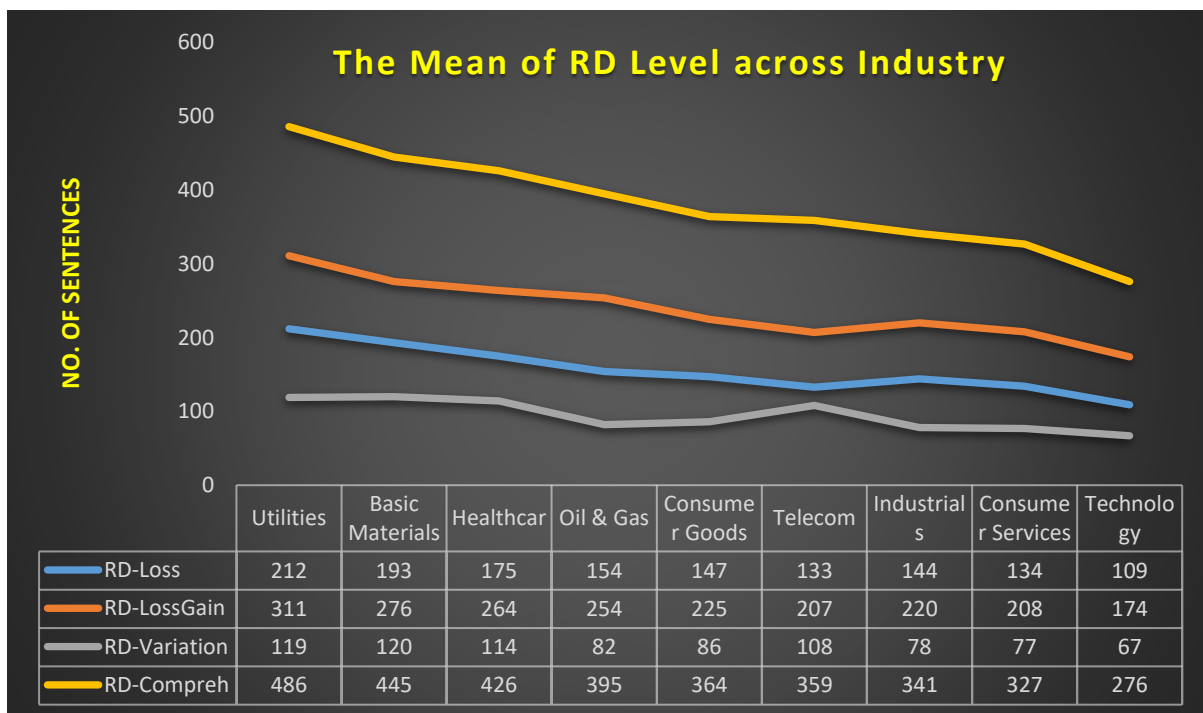
8. The validity Tests of RD Score

We conducted several tests, correlations and OLS regressions to ensure the validity of the RD scores. To ensure that the new suggested keywords are selected properly, the initially selected keywords are selected with the co-author, who is an expert in the content analysis. Then both of us worked to select the most suitable keywords individually, then agreed on final lists. Afterward, the final keywords were sent to an English native speaker who was asked to read these keywords, filter them, and help to determine those that express the different kinds

of risk. Moreover, we applied a filtering process of two steps: (1) following Hussainey et al. (2003), Hussainey (2004), and Elshandidy (2011), we excluded the risk-related keywords that found to be rarely used in the annual reports by investigating a sample of 150 annual reports, and (2) we also excluded some risk-related keywords that used in a context other than the RD context.

To ensure that the QSR was used in the correct way, the co-author, who proposed and used QSR in counting the disclosure level for the first time (Hussainey et al. 2003), reviewed all the steps that are followed and helped me to generate the command file that was applied later. Then, the 100 risk-related sentences published in Table 1 are read manually to determine whether the selected risk keywords succeed to capture the risk information, these sentences were also reviewed by the co-author. Overall, using the computerized content analysis compared with the manual content analysis is more likely to reduce the probability of any disclosure measurement errors.

8.1 Correlation Tests

We also validate our RD scores by linking them with both the cost of capital and firm value. The literature hypothesizes a negative correlation between the disclosure level and cost of capital and a positive correlation between disclosure level and market firm value (e.g., Botosan, 1997; Sengupta, 1998; Richardson & Welker, 2001; Francis et al. 2005, 2008; Orens et al. 2009; 2010; Kothari et al. 2009; Gordon et al. 2010; Dhaliwal et al. 2011; Ntim et al. 2013; Elzahar et al. 2015; Franco et al. 2016). Accordingly, a sample of 328 non-financial firms constituting FTSE All-Share Index during 2005-2016 has been examined. It is noteworthy that the study RD score is measured for the period 2005-2015, while the data on Cost of Debt and Tobin's Q are collected for the period 2006-2016, where there is one year lag to give an opportunity to the risk-information to affect the markets. Cost of Debt (COD) is used as a proxy of cost of capital and Tobin's Q (Tobin) is used as a proxy of market firm value. A set of control variables have been selected from the literature and added to the models to control for both COD and Tobin. Bloomberg is the main source for all variables data.

Table (8) shows the Pearson (Parametric) and Spearman (Non-parametric) correlations between *COD* and *Tobin* and each of the four RD-Scores (*RD-Loss, RD-LossGain, RD-Variation*, and *RD-Compreh*). For *COD*, Table (8) shows a negative and statistically significant correlation between COD and all measures of RD at 1%, except for *RD-Variation*. This initial result may refer to a negative influence of RD level on COD, where the higher the RD level in the current year the lower the COD of the next year. In other words, firms with higher RD

levels may gain debts at lower rates. However, the Tobin results are insignificant except for RD-Loss, where a negative and significant correlation is found.

Table (8): Pearson and Spearman Correlation Results					
Test		RD-Loss	RD-LossGain	RD-Variation	RD-Compreh
Pearson Correlation Sig. (2-tailed)	COD	**-0.081***	**-0.086***	-0.021	**-0.098***
	Tobin	**-0.070***	-0.039	-0.063	-0.023
Spearman Correlation Sig. (2-tailed)	COD	**-0.106***	**-0.126***	**-0.075***	**-0.145***
	Tobin	**-0.056**	-0.012	0.016	0.002

*** Correlation is significant at the 0.01 level (2-tailed). COD stands for cost of debt equity as measured in Bloomberg (VM010), and Tobin measured was taken from Blomberg (F0940).

8.2 Regression Tests

Ordinary Least Squares (OLS) regression has been conducted. The regression models include the RD score as the main independent variable and 13 control variables. Ten dummy variables are added to control for the industry effect, and another 3 are included as year dummies. All the variables are winsorised at 1%. Table (9) shows the results. The results show a negative significant correlation between all RD scores and COD except for the RD-Variation, which is consistent with the literature (e.g., Sengupta, 1998; Dhaliwal et al. 2011; Kothari et al. 2009; Franco et al. 2016). The OLS results of *Tobin* show a positive and significant relationship between all the RD scores and the market firm value at 1%. The results show also a statistically significant relationship between most of the control variables and the RD scores. These results confirm the validity of RD measurement methods introduced and applied in this study.

Table (9): The OLS Regression Results								
	Cost of Debt (COD)				Firm Value (Tobin's Q)			
	RD-Loss	**RD-LossGain**	**RD-Variation**	**RD-Compreh**	**RD-Loss**	**RD-LossGain**	**RD-Variation**	**RD-Compreh**
Regression /Variables	Coefficient (t-statistic)	Coefficient (t-statistic)	Coefficient (t-statistic)	Coefficient (t-statistic)	Coefficient (t-statistic)	Coefficient (t-statistic)	Coefficient (t-statistic)	Coefficient (t-statistic)
RD	**-0.049**</br>**(-2.23)**	**-0.042*** </br>**(-1.72)**	-0.011 </br>(-0.56)	**-0.054**</br>**(-2.15)**	**0.054**</br>**(2.40)**	**0.094***</br>**(3.77)**	**0.076***</br>**(3.72)**	**0.104***</br>**(4.08)**
No.	1,764	1,764	1,764	1,764	1,762	1,762	1,762	1,762
Adj. R2	0.36	0.36	0.36	0.36	0.30	0.31	0.30	0.3045
F-value	43.09 (0.000)	42.96 (0.000)	42.78 (0.000)	43.07 (0.000)	32.47 (0.000)	32.98 (0.000)	32.96 (0.000)	33.13 (0.000)
Controls	Included							
Industry Dummies	Included							

Year Dummies	Included

***significant at 1%, **significant at 5%, *significant at 10%

The study results present the following implications. First, the study presents evidence that risk should be defined from the negative side only and provides a new definition of RD accordingly. The new RD definition is not a substitute rather it is complementary, where the study extends the literature by adding one more definition of RD. Currently, researchers have three definitions, the one presented by this study that researchers can use if they adopt the pre-modern view of risk as losses only, the second presented by Linsley & Shrives (2006) if they adopt the modern view of risk concept, and the third presented by Elshandidy (2011) if they adopt the variation definition of risk. The study contributes by adding more options to RD researchers. It is noteworthy that the new definition of RD presented by this study is not a substitute to the existing definitions but a new definition from a different perspective, despite the fact that we strongly recommend defining risk as losses only and using that definition.

Regardless of the RD measurement method used, researchers should define precisely what they mean by risk and risk information and which view they would adopt, before measuring the RD score. Risk researchers have to consider the three different concepts of "Risk" before engaging in any risk-related research. Then, they should justify the definition of RD that they would adopt. Several studies found to adopt the definition of RD presented by Linsley & Shrives (2006) without any justification, why did they follow the modern view not the pre-modern or the variation view was not justified or discussed. Moreover, RD researchers should be clear and precise on the keywords used to measure RD score, the keywords should be highly consistent with the adopted risk view. The study presents new keywords that are used for the first time in the measurement of RD score and represent the three different views, which could help researchers develop their own lists of risk-related keywords.

From the perspectives of regulators, accounting standards setters and companies, it is more worthy to define the risk before setting any risk-related standards, regulations, or guidelines. From our review of the regulations and the guidelines that aim to organize RD, we noticed that risk is not defined clearly, which may leave the readers confused. Moreover, it could be more worthy that the preparers of annual reports announce about their definition of risk before disclosing any risk information.

9. Conclusion

This study aims to develop the measurement of narrative risk disclosure. The study contributes by extending the ongoing debate on whether the positive outcomes of events should be considered in the risk definition or not. The study proposes a new definition of RD based on the pre-modern view of risk. This definition is formulated after conducting two empirical tests on a sample of annual reports of UK firms. The results confirm the study arguments that the risk information should be prepared and explained as losses only. The first empirical test shows that about 94% of risk information in annual reports is talking about negative outcomes. The second test shows that 87% of the risk-related sentences in the annual reports discussing risks using negative keywords.

Afterward, the study contributes by developing lists of risk-related keywords that are consistent with the study proposed RD definition and the other definitions in the literature. The first list consists of 60 keywords that express and measure the risk as negative outcomes only, a second list consists of 75 keywords to express and measure the risk as both negative and positive outcomes, while the third list consists of 7 keywords to express and measure the risk as a variation around a target. Moreover, a comprehensive list of all these keywords in addition to the "risk" and "uncertainty" keywords is created to measure the RD score as a comprehensive score. Then, these proposed keywords are applied to measure RD scores for a sample of 328 non-financial firms listed on FTSE All-Share Index during 2005-2015. Several validity tests were applied to ensure the validity of RD scores, correlation and regression tests were run and provide expected results consistent with the literature.

The descriptive statistics of RD scores show that the overall trend increases over the period (2005-2015) for the four measures. The score of RD-Compreh score is the highest across the study period, while the score for RD-Variation is the lowest. The utilities industry found to report the highest RD score, while the technology industry found to report the lowest RD score across the nine examined industries.

The study ends with important implications for risk-interested researchers and other business community members. The study main argument is that risk should be defined from the negative side only. Although people understand risks as losses, the RD literature defines RD differently; once as losses only (e.g., Lupton, 1999; Horcher, 2005), once as losses and gains (e.g., Linsley & Shrives, 2006), and once and a variation (e.g., Abraham & Cox, 2007; Elshandidy, 2011). However, the study presents five theoretical arguments for why RD should be defined as negative outcomes only. The results of the empirical tests confirm these

arguments. Regardless of the RD measurement method used, researchers should define precisely what they mean by risk and risk information before measuring the RD score. Moreover, accounting standard setters and other regulators should announce clearly what they mean by risk.

Future research should contribute to the ongoing debate and provide more evidence on whether positive outcomes should be included in the risk definition or not. More investigation is still required on the value-relevance of RD defined from the three different perspectives, which one is more value-relevant is an interesting question.

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	Table (1): A Test of RISK in a sample of 150 annual reports	
No	**Sentence**	**Negative or Positive Outcomes**
	Panel (A): Risk Sentences Discussing Risk as a Loss	
1	Some of the countries in which the Group operates have a reputation for <u>corruption,</u> and given that many of our contracts involve large sums of money, we are at **RISK** of being accused of <u>bribery</u> and other <u>unethical</u> behaviour.	Negative
2	There will be persistent **RISKs** of <u>shocks</u> coming from a combination of events and regulatory action in the financial markets and the <u>painful</u> fiscal adjustments into which Governments have been forced.	Negative
3	The **RISKs** include, but are not limited to, <u>Terrorism, hostage taking, military repression, expropriation, extreme fluctuations</u> in currency exchange rates, high rates of inflation and labour unrest.	Negative
4	As well as credit **RISK** <u>exposures</u> inherent within the Group's outstanding receivables the group is <u>exposed</u> to counterparty credit RISK arising from the placing of deposits and entering into derivative financial instrument contracts with banks and financial institutions.	Negative
5	The Board has considered the probability of those **RISKs** occurring and their impact, as well as the <u>actions</u> that would be taken in response to them if they did occur.	Negative
6	Our greatest <u>exposure</u> lies in our International Power Projects business, and they perform **RISK** assessments on a contract-by-contract basis.	Negative
7	Our business continues to have a low environmental impact and its activities are not expected to give rise to any <u>significant environmental</u> **RISK** over the next twelve months.	Negative
8	Commercial property development remains <u>difficult;</u> the combination of construction, tenant and valuation **RISK** means that it is still very <u>hard</u> to generate development profits.	Negative
9	The <u>bad weather</u> experienced at the end of 2009 and early 2010 will undoubtedly reduce traffic volumes and income but we have a fixed price gritting contract on the route, which takes on the bad weather RISK, and therefore we will not <u>face</u> any additional costs.	Negative
10	This **RISK** assessment highlights to the Group what makes the product safe and flags if there are any potential <u>hazards</u> with the product.	Negative
11	In addition, specialist third party consultants are tasked from time to time to perform an internal audit of a specific key business **RISK,** for example the Company's <u>compliance</u> with environmental and health & safety requirements.	Negative
12	The principal financial **RISKs** to which the Group is <u>exposed</u> through its activities are **RISKs** of <u>changes in foreign currency</u> exchange rates and interest rates.	Negative
13	We recognise the **RISKs** associated with operating an airline and work tirelessly to ensure the <u>safety</u> of our customers, our people and our shareholders' investments.	Negative
14	The Group's <u>exposures</u> to interest rates on financial assets and financial liabilities are detailed in the liquidity RISK management section of this note.	Negative
15	Such contracts enable the Group to <u>mitigate</u> the **RISK** of changing interest rates on the cash flow <u>exposures</u> on the issued variable rate debt held.	Negative
16	The Group's operations <u>expose</u> it to a variety of **RISKs** and <u>uncertainties,</u> including: Market **RISK**: The Group provides a range of products and services, and there is a **RISK** that the demand for these services <u>will vary</u> from time to time because of <u>competitor action</u> or economic cycles.	Negative
17	Such development projects carry business **RISKs**, including reputational **RISK**, <u>abortive expenditure</u> and potential customer <u>claims</u> which may have a <u>material impact</u> on the Group.	Negative
18	The <u>credit</u> **RISK** on liquid funds is limited because the counterparties are banks with high credit ratings assigned by international credit rating agencies.	Negative
19	These systems are designed to manage, rather than eliminate, the **RISK** of <u>failure</u> to achieve business objectives and consequently can provide reasonable, but not absolute, assurance against <u>material mis-statement</u> or <u>loss.</u>	Negative
20	The Group's overall **RISK** management programme focuses on <u>the unpredictability</u> of commodity and financial markets and seeks to manage potential <u>adverse effects</u> on the Group's financial performance.	Negative

21	Workplace hazards are formally **RISK** assessed and appropriate control measures (physical and procedural) are implemented.	Negative
22	As the Group has large cash resources to meet these payments and financing is arranged for the aircraft prior to delivery, no significant funding **RISK** is perceived.	Negative
23	There is a **RISK** that the number of deaths in any year significantly reduces.	Negative
24	The **RISK** is also mitigated by recruiting and developing a strong finance function, which is focused on ensuring the accuracy and integrity of the reported results.	Negative
25	These **RISKs** include the **RISK** of inadequate or failed internal and external processes and systems, departure of key management personnel, human error and external events such as changes in credit terms offered by suppliers, major disruption to delivery services or to the product supply chain.	Negative
26	Borrowings issued at variable rates expose the Group to cash flow interest rate **RISK.**	Negative
27	Its principal duties are to monitor the integrity of the financial statements, to review the internal controls and **RISK** management systems, to review the work of internal audit and to consider all aspects of the relationship with the external auditors.	Negative
28	The Group mitigates interest rate **RISK** on its borrowings by matching, to the extent possible, the maturity of its cash balances with the interest rate reset periods on the swaps related to its borrowings.	Negative
29	Over time, therefore, we have developed a comprehensive range of operating procedures and processes to ensure that we minimise any **RISK** of harm to people or to the environment.	Negative
30	The group's increasing dependence on information systems has also heightened the information security **RISK** to the group with breaches in our data security systems having a potential impact on our business and reputation.	Negative
31	There is also a **RISK** of tax laws being amended by authorities in the different jurisdictions in which the group operates which could have an adverse effect on the financial results.	Negative
32	Concentration of credit **RISK** with respect to trade receivables is limited due to the group's customer base being large and diverse.	Negative
33	Business **RISKs:** HRG operates in a highly competitive market and HRG may not react adequately to changes in the corporate travel market; general economic downturns such as the current macro-economic crisis, terrorism, the fear of terrorism, travel industry strikes, fuel price escalation, national disasters, health pandemics or similar events could reduce revenues.	Negative
34	As a result of the recent and ongoing financial crisis, the Company has evaluated and introduced additional efforts to try to mitigate credit **RISK** exposure.	Negative
35	The Group mitigates liquidity **RISK** by managing the cash generation of its operations, combined with bank borrowings and long-term debt.	Negative
36	The group's interest rate **RISK** arises from long-term borrowings.	Negative
37	All potentially hazardous activities are formally **RISK** assessed.	Negative
38	The Audit Committee reviewed the Company's internal controls and **RISK** management systems by considering the Group's **RISK** assessment process and the effectiveness of the controls to mitigate those RISKs.	Negative
39	The Group takes its responsibilities seriously and contracts may be allocated to dedicated teams with audits performed to reduce the **RISK** of non-compliance.	Negative
40	These policies and guidelines primarily cover foreign exchange **RISKy** commodity price **RISKy** credit **RISKy** liquidity RISK and interest rate RISK.	Negative
41	Further detail on the principal RISKs facing the Group is set out below.	Negative
42	Identification of hazards assessment of the **RISKs** and the introduction of control measures form the basis of these systems.	Negative
43	It considers whether the significant RISKs faced by the Group are being identified, evaluated and appropriately managed, having regard to the balance of RISK, cost and opportunity.	Negative
44	The **RISK** of failure of counterparties to these instruments and of the investment manager is monitored regularly by the Committee; as such failure could expose the scheme to loss.	Negative
45	Reduced liquidity could put at **RISK** our ability to meet loan and other trading commitments.	Negative
46	The **RISK** of the auditor withdrawing from the market was also considered.	Negative
47	We continue to make significant progress in reducing the **RISK** of injury to employees; as a result, the number of reportable accidents has reduced again this year.	Negative
48	In order to hedge its exposure to certain foreign exchange **RISKs**, the Group enters into forward contracts.	Negative

49	The Group strives to avoid occupational illnesses by taking all necessary steps to provide a working environment that minimises any **RISK** to the health of its workers.	Negative
50	To date the Group has also had a low level of bad debt in the IPP business although the **RISK** of a major default is high.	Negative
51	There is a **RISK** that fraud or accounting discrepancies may occur if the financial and operational control framework is inadequate.	Negative
52	Trade receivables are the main source of credit **RISK** to the Group. However, this **RISK** is minimised as much as possible through well–established credit control procedures.	Negative
53	The Company's operations are subject to all of the hazards and **RISKs** normally incident to mineral exploration, mine development and operation, any of which could result in damage to life or property, environmental damage and possible legal liability for any or all damage.	Negative
54	We mitigate this **RISK** by retaining the ability to react quickly to changes in customer demand and to adjust our offer accordingly.	Negative
55	In some jurisdictions there are significant **RISKs** of political instability which can result in civil unrest, equipment seizure, renegotiation or nullication of existing agreements, changes in laws, taxation policies or currency restrictions.	Negative
56	As stated in our accounting policies Note 1 on page 83 the activities of the Group expose it directly to the financial **RISKs** of changes in foreign currency exchange rates and interest rates.	Negative
57	AMEC is exposed to the **RISK** that the IT systems upon which it relies fail.	Negative
58	These procedures include ongoing monthly functional reviews designed to identify, evaluate and manage the significant **RISKs** faced by the company.	Negative
59	The Group prides itself on maintaining good relationships with suppliers and subscribes to multiple information sources and organisations that deal with food safety, which allows the Group to see current and potential emerging **RISKs** and as a result prepare accordingly.	Negative
60	Should any of the **RISKs** actually materialise then Delight's business, financial condition, prospects and share price could be materially and adversely affected.	Negative
61	The group seeks to limit interest rate and foreign currency **RISKs** described above by the use of financial instruments and as a result has a credit RISK from the potential non-performance by the counterparties to these financial instruments, which are unsecured.	Negative
62	Once appointed, the **RISK** manager will report to the Chief Financial Officer and be responsible for identifying potential **RISKs** and proposing procedures and controls to mitigate such RISKs.	Negative
63	All food safety and quality systems depend upon identifying the **RISKs** and potential hazards.	Negative
64	In order to reduce the currency **RISK** arising, the Group uses direct borrowings in the same currency as those investments.	Negative
65	The Board recognises the need to identify areas of significant business **RISK** and to develop and implement strategies to mitigate these risks.	Negative
66	The objective of liquidity **RISK** management is to ensure sufficient cash resources and the availability of funding as required.	Negative
67	The economic entity has adopted a policy of only dealing with credit-worthy counter-parties and obtaining sufficient collateral or other security where appropriate, as a means of mitigating the **RISK** of financial loss from defaults.	Negative
68	Like all businesses, we face the **RISK** of increased costs from compliance with new laws and regulations.	Negative
69	The inability of the Group to supply against contractual commitments is a RISK which could have an adverse impact on the business.	Negative
70	As Drax relies on third-party suppliers for the delivery of coal and other goods and services, it is exposed to the **RISK** of non-performance by these third-party suppliers.	Negative
71	On a regular basis, it will receive reports on RISK management, fraud, legal and corporate governance matters, in order to help it assess the effectiveness of the **RISK** management and control frameworks.	Negative
72	The Group is required to formally review the principal areas of **RISK** and uncertainty for all its businesses in order for the major **RISKS** to be addressed at all levels.	Negative
73	Because a number of fiscal periods remain open to review by the tax authorities, coupled with the complexity of the Group and the transactions they have undertaken, there remains a **RISK** that significant additional tax liabilities may arise.	Negative

74	Management estimates discount rates using pre-tax rates that reflect current market assessments of the <u>time value of money</u> and the **RISKs** specific to the CGUs.	Negative
75	We are not required to consider whether the board's statements on <u>internal control</u> cover all **RISKs** and controls, or form an opinion on the <u>effectiveness</u> of the group's corporate governance procedures or its **RISK** and control procedures.	Negative
76	The Group is <u>exposed </u>to foreign currency **RISK** on purchases denominated in US dollars.	Negative
77	The Group is not <u>exposed</u> to equity securities price **RISK** because no such investments are held by the Group.	Negative
78	The Company's **RISK** management policies are established to identify and analyse the **RISKS** <u>faced </u>by the Company, to set appropriate risk <u>limits and controls</u>, and to <u>monitor</u> risks and adherence to limits.	Negative
79	Conversely, whilst floating rate borrowings are not exposed to changes in fair value, the Group is <u>exposed</u> to cash flow interest rate **RISK** as <u>costs are impacted by changes</u> in market rates.	Negative
80	Many of the International Power Projects contracts require sophisticated **RISK** management, and the Group deploys a number of tools to manage its risk, including advanced payments, letters of credit, <u>bank guarantees,</u> bonds, credit and <u>political risk insurance.</u>	Negative
81	The Group's <u>credit</u> **RISK** is primarily attributable to its trade and other Receivables. The amounts presented in the balance sheet are net of allowances for <u>doubtful receivables.</u>	Negative
82	Foreign exchange **RISK** arises when future commercial transactions or recognised assets or liabilities are denominated in a currency <u>that is not the entity's functional currency.</u>	Negative
83	<u>Internal Audit's work</u> is focused on areas of greatest **RISK** to EasyJet, as determined by managements' risk identification and assessment processes as validated by Executive Directors.	Negative
84	We manage the commercial and operational **RISKS** <u>faced</u> by the group in accordance with policies approved by the board.	Negative
85	As a result of the global economic <u>downturn</u>, management has taken a number of steps to <u>protect the Group against defaulting customers</u>, by amending sales contracts to provide for advance payment and delaying the transfer of title to goods sold, by obtaining parent company guarantees and implementing **RISK** profiling of key and new customers.	Negative
86	These controls are managed by the use of formal procedures designed to highlight financial, operational, environmental and social **RISKs** and provide appropriate information to the Board enabling it to <u>protect</u> effectively the Company's assets and, in turn, maintain shareholder value.	Negative
87	The Group is <u>exposed</u> to commodity price RISK in its LPG and oil distribution businesses.	Negative
88	Our products, when properly used, present <u>negligible</u> health **RISKs** and, where appropriate, Materials <u>Safety</u> Data Sheets advising on <u>optimal application procedures</u>, are available to our customers.	Negative
89	We are well aware that buying businesses can be **RISKy**, and that statistics show that many of them are **value-destructive.**	Negative
90	In light of the current global economic <u>downturn,</u> steps have been taken in order to assess and monitor any potential impact on AMEC's project opportunities and address potential <u>increased</u> supply chain **RISK.**	Negative
Panel (B): Mixed and Unclear Sentences		
91	We believe this approach makes sound business sense as well as being crucial for **RISK** and <u>opportunity</u> management.	Negative & Positive
92	We also recognise that the effective management of social, environmental and ethical issues can help us to identify and <u>manage</u> **RISKs** and develop new commercial <u>opportunities.</u>	Negative & Positive
93	We continue to assess the **RISK** profile of <u>opportunities </u>and carefully select the type of contracts and clients.	Negative & Positive
94	The attainment of Level 3 in the implementation of the DNV management information system which provides a framework to improve occupational health and <u>safety</u> performance, including **RISK** and <u>opportunity</u> identification, analysis, target setting, and measurement	Negative & Positive
95	This section describes the principal **RISKs** and uncertainties which may affect EasyJet's business, financial results and <u>prospects.</u>	Negative & Positive
96	The board's policies are implemented by dedicated specialists who make sure effective processes and procedures are in place to assure compliance and to identify and to report on **RISKs** and <u>opportunities.</u>	Negative & Positive

97	All of the Directors bring independent judgment to bear on issues of strategy, **RISK**, performance, resources, key appointments and standards.	Unclear
98	In addition, the Audit Committee, on behalf of the Board, has conducted a specific annual review of the effectiveness of the Group's system of internal controls and **RISK** management.	Unclear
99	A mechanism exists to extend the Group's formal **RISK** management processes to any significant new business acquired or begun by the Company immediately upon acquisition or start-up.	Unclear
100	**RISK** management policies have been set by the Board and applied by the Group.	Unclear

Table (2): The Negative and Positive Keywords Frequency			
Risk as a Gain	Frequency	Risk as a Loss	Frequency
Gain	95	Loss	378
Potential	151	Exposure	1,044
Opportunity	83	Uncertain	451
Prospect	23	Against	263
Advantage	5	Failure	224
Viable	4	Hazard	42
Upside	2	Threat	10
Peak	1	Catastrophe	11
Chance	0	Harm	9
Surprise	0	Contingency	8
Total	**364 (13%)**	**Total**	**2,440 (87%)**
		Unable	4
		Danger	3
		Shock	3
		Shortage	2
		Total	**2,452**

Table 3: List of Loss Keywords (RD-Loss) *

Risk Category	List of the Suggested Keywords		Initial List	Frequency	Final List	Frequency
Financial Risk - Interest rate - Exchange rate - Commodity - Liquidity - Credit	Unable Insufficiency Insolvency Bankruptcy Shortage Lack Default Fluctuation Variation Change Uncertainty Disappoint	Failure Deficit Loss Exposure Threat Collapse Crisis Postpone Evade Volatility Collapse Bad Struggle	Loss Impairment **Change** Exposure **Uncertain** Failure **Variation** **Volatility** Adverse Difficulty Deficit Fraud **Challenge**	4123 3836 2439 1714 893 532 531 518 508 457 446 403 397	Loss Impairment Exposure Failure Adverse Difficulty Deficit Fraud Accident Emergency Conflict Disrupt Damage	4123 3836 1714 532 508 457 446 403 318 255 233 186 166
Operation Risk - Customer satisfaction - Product development - Efficiency and performance - Sourcing - Stock obsolescence and shrinkage - Product and service failure - Environmental - Health and safety - Brand name erosion	Dissatisfaction Unsatisfactory Unfavourable Undesirable Deficiency Defect Fault Mistake Scarcity Insufficiency Lack Shortage Clash Troubles Shrinkage Obsolescence Failure Erosion Deterioration Impairment Flood Earthquake Hurricane Tornado Catastrophe Fire Death Disrupt Distortion Collapse Adverse Challenge	Disaster Havoc Devastation Tragedy Terrorism Radiation Emergency Contingency Injure Blood Poisonous Toxin Infection Victim Damage Severity Serious Accident Harm Hazard Danger Scandal Suffer Breakdown Problem Dilemma Alarm Emission Warn Vandalism Shock Bad Disappoint Struggle Complex	**Fluctuation** Accident **Complex** Emergency Conflict Disrupt Damage Unable Suffer Breach Litigation Hazard **Serious** Default Fire Bad **Problem** Severity Dispute Crisis Emission Threat Deterioration Disaster Harm Obsolescence Shortage Danger Insufficiency Non-compliance Discrimination Lack Breakdown Bankruptcy Fine Disappoint Corruption Bribe Terrorism Contingency Deficiency Defect Warn Flood Insolvency Erosion Theft	339 318 278 255 233 186 166 164 164 157 154 148 147 144 137 126 110 100 93 91 85 75 65 63 63 62 59 58 56 56 55 50 50 39 36 33 30 28 26 24 23 23 21 21 20 19 19	Unable Suffer Breach Litigation Hazard Default Fire Bad Severity Dispute Crisis Emission Threat Deterioration Disaster Harm Obsolescence Shortage Danger Insufficiency Non-compliance Discrimination Lack Breakdown Bankruptcy Fine Disappoint Corruption Bribe Terrorism Contingency Deficiency Defect Warn Flood Insolvency Erosion Theft Prosecute Crime Earthquake Collapse Illegal Shock Lawsuit Catastrophe Hurricane	164 164 157 154 148 144 137 126 100 93 91 85 75 65 63 63 62 59 58 56 56 55 50 50 39 36 33 30 28 26 24 23 23 21 21 20 19 19 19 19 18 18 17 16 15 15 15
Empowerment Risk - Leadership and management - Outsourcing - Performance incentives - Change readiness - Communication	Radical Misuse Malpractice Mismanagement Miscommunicate Dispute Conflict Disappoint Violate Breach Falsify Mistake Distortion	Deficiency Loss Unethical Immoral Unavailable Fake Malicious Dilemma Fault Bribe Fine Theft Corruption				

	Discrimination Racism Fire	Exposure Adverse	Prosecute Crime Earthquake Collapse Illegal Shock	19 19 18 18 17 16		
Information Processing & Technology Risk - Integrity - Access - Availability - Infrastructure	Attack Hack Crack Virus Spyware Steal Theft False Falsify Cheat Leak Complex Manipulate Unauthorised Unavailable Insecure Breach Violate Shock Collapse	Exposure Danger Threat Hazard Harm Loss Fault Mistake Deficiency Serious Problem Dilemma Damage Victim Warn Malicious Fake Bad Adverse	**Struggle** Lawsuit Catastrophe Hurricane	16 15 15 15		
Integrity Risk - Management and employee fraud - Illegal acts - Reputation	Misappropriation Fraud Cheat Falsify Deceive Bribe Fine Steal Theft Robbery Forgery Fake Leak Malicious Illegal Dishonest Corruption Dilemma Insolvency Bankruptcy Fire	Malpractice Mismanagement Conspire Guilty Punish Conviction Prosecution Crime Lawsuits Sentence Litigation Unethical Immoral Non-committed Non-compliance Discrimination Racism Scandal Offense Bad				
Strategic Risk - Environmental scan - Industry - Business portfolio - Competitors - Pricing - Valuation - Planning - Life cycle - Performance measurement - Regulatory - Sovereign and political	Sovereign Revolution Uprise Coup Violence Chaos Disorder Clash Worry Instability Terrorism War Tragedy Collapse Destroy Ruin Vandalism Conflict Damage Adverse	Lawsuit Loss Misprice Misestimate Uncertain Downside Frustrated Disadvantage Difficulty Hazard Disappoint Challenge Dispute Death Struggle Contingency Emergency Deficiency Shock Insolvency				

						Bad	

Table 4: The Selected Positive Keywords

Literature Keywords	List of Suggested Positive Keywords	Initial Positive List	Frequency	Final Positive List	Frequency	Final Positive & Negative List	
Linsley & Shrives (2006a)	Opportunity Prospect	Gain	3115	Gain	3115	**Positive Keywords** ------------	Fire
		Achievement	2552	Achievement	2552		Bad
		Opportunity	1973	Opportunity	1973	Gain	Severity
Abraham & Cox (2007)	Opportunity Prospect Potential Upside Advantage	Success	1715	Success	1715	Achievement	Dispute
		Potential	1651	Potential	1651	Opportunity	Crisis
		Outstanding	1592	Excellent	777	Success	Emission
		Agree	1232	Prospect	571	Potential	Threat
		Possible	875	Advantage	507	Excellent	Deterioration
Elshandidy (2011)	Chance Gain Peak Viability Potential Advantage Upside	**Accept**	826	Surplus	417	Prospect	Disaster
		Excellent	777	Satisfactory	381	Advantage	Harm
		Prospect	571	Superior	191	Surplus	Obsolescence
Elshandidy et al. (2013;2015)		Advantage	507	Win	136	Satisfactory	Shortage
		Surplus	417	Chance	69	Superior	Danger
		Satisfactory	381	Remarkable	18	Win	Insufficiency
		superior	191	Accomplish	16	Chance	Non-compliance
Elshandidy & Neri (2015)		Win	136			Remarkable	Discrimination
		Chance	69			Accomplish	Lack
		Peak	59				Breakdown
		Viable	56				Bankruptcy
		Remarkable	18			**Negative Keywords**	Fine
		Accomplish	16			Loss	Disappoint
		Peacefully	14			Impairment	Corruption
	Achievement Accomplishment Success Outstanding Remarkable Wonderful Excellent Perfect Satisfactory Agree Possible Accept Luck Concord Victory Congruence Win Harmony Favourable Peacefully Surplus Superior	Perfect	14			Exposure	Bribe
		Upside	14			Failure	Terrorism
		Wonderful	5			Adverse	Contingency
		Harmony	4			Difficulty	Deficiency
		Favorable	3			Deficit	Defect
		Luck	2			Fraud	Warn
		Concord	2			Accident	Flood
		victory	1			Emergency	Insolvency
		Congruence	0			Conflict	Erosion
						Disrupt	Theft
						Damage	Prosecute
						Unable	Crime
Suggested Keywords (Disctionary)						Suffer	Earthquake
						Breach	Collapse
						Litigation	Illegal
						Hazard	Shock
						Default	Lawsuit
							Catastrophe
							Hurricane

Table 5: The Variation Keywords List (RD-Variation)					
Source	**Suggested Variation Keywords**	**Initial List**	**Frequency**	**Final List**	**Frequency**
Linsley & Shrives (2006a)	None	Increase	6714	Increase	6714
		Change	5384	Decrease	1078
		Differ	3675	Decline	662
Abraham & Cox (2007)	Variation	Decrease	1078	Volatility	518
	Fluctuation	Decline	662	Variation	484
	Volatility	**Reverse**	553	Fluctuation	339
	Oscillation	Volatility	518	Swing	21
	Amplitude	Variation	484		
		Fluctuation	339		
Elshandidy et al. (2013;2015)	Decline	**Alter**	164		
	Decrease	**Diversify**	111		
	Differ	**Opposite**	61		
	Diversify	Swing	21		
Elshandidy & Neri (2015)	Fluctuation	**Dispersion**	15		
	Increase	Deviate	9		
	Reverse	Surpass	9		
Elshandidy (2011)	Diminish	Diverge	5		
	Change	Diminish	4		
	Variation	Inverse	4		
		Amplitude	2		
Suggested Keywords (Dictionary)	Inverse	Veer	1		
	Opposite	Oscillation	0		
	Alter	Inconstancy	0		
	Surpass	Flux	0		
	Diverge				
	Dispersion				
	Inconstancy				
	Deviate				
	Swing				
	Veer				
	Flux				

Table 6: Descriptive Statistics for the RD Score as total and across Years*

	N	Min	Max	Mean	Median	Std. Dev	Skewness	Kurtosis
Panel A: Descriptive Statistics for the RD-Loss Score								
All Years	2898	21	417	**148**	137	70.91	0.95	1.09
2005	230	22	368	96	86	53.26	1.75	4.70
2006	238	23	338	111	102	54.89	1.21	1.95
2007	249	26	344	115	108	53.36	0.98	1.46
2008	261	24	357	139	127	61.79	0.96	1.14
2009	265	24	396	153	141	69.87	1.03	1.18
2010	266	26	402	154	142	68.40	0.93	1.07
2011	268	24	398	154	146	67.11	1.06	1.70
2012	268	21	411	154	148	66.29	0.86	1.19
2013	274	26	407	174	166	74.92	0.89	0.68
2014	285	25	404	174	170	70.58	0.75	0.97
2015	294	34	417	180	171	76.55	0.74	0.59
Panel B: Descriptive Statistics for the RD-LossGain Score								
All Years	2898	36	607	**225**	210	102.14	0.87	0.85
2005	230	37	564	148	132	75.99	1.93	6.61
2006	238	43	573	172	156	78.96	1.38	3.47
2007	249	38	516	176	164	74.71	0.88	1.36
2008	262	36	585	205	191	85.89	0.93	1.66
2009	265	52	554	223	211	94.07	0.83	0.72
2010	265	54	551	227	216	93.22	0.89	1.13
2011	266	76	604	233	223	93.35	1.01	1.46
2012	267	52	552	238	223	96.87	0.71	0.37
2013	274	53	605	269	259	106.14	0.74	0.43
2014	286	40	589	274	265	101.99	0.57	0.58
2015	296	45	607	284	273	110.26	0.62	0.29
Panel C: Descriptive Statistics for the RD-Variation Score								
All Years	2898	8	320	**85**	76	46.51	**1.39**	**2.78**
2005	230	8	267	59	51	37.10	2.15	6.76
2006	237	13	301	70	61	41.63	2.21	6.91
2007	249	9	266	69	61	40.09	2.10	6.29
2008	260	8	280	78	70	43.75	1.67	3.92
2009	265	13	320	84	74	50.96	1.90	4.97
2010	264	10	291	85	77	44.41	1.53	3.42
2011	265	11	284	87	79	44.33	1.49	3.48
2012	267	8	311	89	83	46.14	1.30	3.15
2013	273	8	288	99	90	47.69	0.90	1.03
2014	288	10	290	101	94	44.93	1.09	2.12
2015	300	20	279	102	97	47.00	0.87	1.03
Panel D: Descriptive Statistics for the RD-Comprehensive Score								
All Years	2898	52	977	**356**	328	163.69	0.91	0.92
2005	228	52	898	227	209	116.14	1.97	6.65
2006	238	65	760	268	250	122.03	1.35	2.60
2007	251	53	814	280	252	125.81	1.29	2.78
2008	262	54	878	320	300	137.94	1.10	1.97
2009	265	80	947	347	317	153.05	1.08	1.64
2010	265	96	907	357	334	150.89	1.03	1.48
2011	266	117	970	368	351	149.90	1.06	1.58
2012	268	54	888	375	359	155.56	0.71	0.52
2013	272	73	919	423	403	165.09	0.70	0.41
2014	287	71	977	439	423	161.33	0.69	0.90
2015	297	83	966	456	436	173.97	0.58	0.30

*Descriptive statistics were conducted after excluding 710 missing observation on RD out of a total of 3608 and after trimming top and bottom 1% of all the remaining RD-Scores, but before any data transformation.

	Table 7: Descriptive Statistics for the RD Score across Industries*								
	Industry	**N**	**Min**	**Max**	**Mean**	**Median**	**Std. Dev**	**Skewness**	**Kurtosis**
	Panel A: Descriptive Statistics for the RD-Loss Score								
	All Industries	2898	21	417	**148**	137	70.91	0.95	1.09
1	Consumer Goods	339	28	407	147	135	75.00	0.82	0.50
2	Oil & Gas	138	22	415	154	148	74.49	0.85	1.19
3	Consumer Services	734	23	322	134	128	58.05	0.38	-0.46
4	Industrials	1083	21	393	144	138	59.78	0.85	1.29
5	Healthcare	119	50	417	175	151	94.42	0.98	-0.07
6	Basic Materials	244	26	411	193	189	95.20	0.38	-0.65
7	Telecommunications	55	27	326	133	113	74.63	1.01	0.24
8	Utilities	62	46	404	212	199	94.76	0.17	-0.83
9	Technology	124	24	270	109	106	46.33	0.53	0.26
	Panel B: Descriptive Statistics for the RD-LossGain Score								
	All Industries	2898	36	607	**225**	210	102.14	0.87	0.85
1	Consumer Goods	339	46	570	225	204	104.74	0.78	0.29
2	Oil & Gas	138	46	583	254	249	114.91	0.56	0.07
3	Consumer Services	730	39	573	208	200	88.19	0.54	0.51
4	Industrials	1083	38	607	220	208	90.40	0.90	1.35
5	Healthcare	118	63	586	264	239	119.33	0.89	0.20
6	Basic Materials	248	38	605	276	269	132.86	0.42	-0.63
7	Telecommunications	55	37	429	207	186	101.35	0.66	-0.47
8	Utilities	63	53	585	311	285	131.52	0.25	-0.75
9	Technology	124	36	366	174	169	67.15	0.43	0.12
	Panel C: Descriptive Statistics for the RD-Variation Score								
	All Industries	2898	8	320	**85**	76	46.51	1.39	2.78
1	Consumer Goods	334	10	247	86	81	43.24	0.91	1.04
2	Oil & Gas	135	9	223	82	74	45.67	1.15	1.45
3	Consumer Services	736	8	254	77	75	35.91	0.77	1.20
4	Industrials	1087	8	236	78	73	35.90	0.79	0.73
5	Healthcare	127	9	301	114	94	74.79	0.86	-0.21
6	Basic Materials	240	9	320	120	107	67.07	0.71	-0.17
7	Telecommunications	55	10	273	108	73	74.94	0.83	-0.68
8	Utilities	62	17	303	119	106	59.45	0.82	0.55
9	Technology	122	12	159	67	66	26.47	0.74	1.34
	Panel D: Descriptive Statistics for the RD-Comprehensive Score								
	All Industries	2898	52	977	**356**	328	163.69	0.91	0.92
1	Consumer Goods	341	80	970	364	333	175.77	1.02	1.08
2	Oil & Gas	138	53	893	395	377	182.49	0.52	-0.13
3	Consumer Services	734	58	820	327	316	139.10	0.53	0.24
4	Industrials	1082	54	977	341	324	138.40	0.78	0.97
5	Healthcare	120	91	923	426	377	204.17	0.75	-0.22
6	Basic Materials	243	53	954	445	426	213.40	0.38	-0.78
7	Telecommunications	55	52	859	359	297	198.34	0.88	-0.12
8	Utilities	62	72	966	486	459	212.20	0.39	-0.51
9	Technology	124	54	581	276	274	106.36	0.41	0.29

*Descriptive statistics were conducted after excluding 710 missing observation on RD out of a total of 3608 and after trimming top and bottom 1% of all the remaining RD-Scores, but before any data transformation.