A Systematic Literature Review on Risk Disclosure Research: State-of-the-art and Future Research Agenda

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Abstract

This study presents a systematic review of the existing literature on corporate risk disclosure (RD). The study reviews 104 studies published in 51 high-ranked journals over the period 1999–2019 following the systematic literature review methodology developed and employed by past works. The results highlight the substantial knowledge gaps and inconclusive findings of extant literature in several aspects, including identifying avenues for further research in terms of research designs, settings, scope and theories. The findings also indicate that limited studies focus on developing countries, private institutions, and non-profit organizations. Similarly, our findings show that existing research that examines other firm and cross-country drivers of risk, such as national accounting, auditing, economic, governance, language, and legal systems, are not well documented. By contrast, our review illustrates that there is an increase in the number of studies published in recent years with over one-half of those that we review in this research published in the last six years of our sample period. Furthermore, our results suggest that past review studies have also focused excessively on the immediate firm-level characteristics, such as firm size, growth, leverage, value, and cost of capital. The findings of our review will be of great interest to academics, accounting standard-setters, managers and practitioners, policymakers, regulators, researchers, and students.

1. Introduction

Risk Disclosure (RD) disseminates information on the present and potential risks that organizations face that could affect their continuity, which is a crucial issue to stakeholders (Elamer et al. 2019, 2020). Therefore, RD could be one of the most important financial reporting categories to stakeholders. During the last two decades, several accounting standards and regulations were issued to modulate the RD process. In January 1997, the Securities and Exchange Commission (SEC) in the USA issued Financial Reporting Release (FRR No. 48) that required companies to publish information on market risks. In 2001, the German Accounting Standard Board (GASB) issued GAS 5 "Risk Reporting." In 2005, the International Accounting Standards Board (IASB) issued the International Financial Reporting Standard (IFRS 7) that came into effect in January 2007 to regulate the disclosure of financial instruments' risks. Besides the above major national RD reforms, the Basel Committee devoted Pillar 3 of the Basel 2 Accord that was issued in 2004 and subsequently revised in 2009 and 2015 to regulate RD in banks. Finally, many corporate governance codes have been issued by different countries around the world; most of these codes set out principles and have sections that focus on risk management and disclosure (Ntim et al. 2013). All this legislation underscores the importance of RD and, consequently, the increasing attention paid to RD over the past decades by academics, accounting standard-setters, policymakers, practitioners and regulators.

Despite acknowledging the importance of RD as indicated by the numerous RD regulations that have been issued by national and international regulators, existing literature has reported limited evidence on the value relevance of RD quality, its effectiveness, and the level of compliance with RD regulations, particularly in the financial sector (Al-Hadi et al. 2016; Elshandidy et al. 2018b; Maffei et al. 2014). Also, despite the increasing number of empirical works on RD, review papers in this area are limited. Similarly, very few studies have been conducted in the financial sector; only 32 studies have examined samples of financial institutions and banks around the world. These gaps in the RD literature in addition to our recognition of the importance of RD compared with other disclosure categories are among the main reasons to undertake this comprehensive systematic review of the existing RD research in both non-financial and financial institutions. The main objectives of this study, therefore, are to conduct a systematic review of the existing RD research; identify gaps and potential implications; and offer suggestions for future research. A crucial general benefit of a review study of this nature is to help readers, particularly academics, policymakers, practitioners, regulators, researchers and students to acquire a quick understanding of the state of research within an area from a few notable sources. Therefore, the main aim of our current review is to provide readers with an authoritative and comprehensive summary of the extant RD literature, as well as identify its limitations, and set the agenda for future research.

Consequently, we seek to contribute to the extant research by extending and complementing the existing limited review studies on RD by reviewing a larger number of studies that cover both financial and non-financial institutions in developed and developing countries over a longer period. Specifically, we identified five studies that review the RD literature: (i) Ryan (1997); (ii) Ryan (2012); (iii) Khlif and Hussainey (2016); (iv) Elshandidy et al. (2018a); and (v) Tahat et al. (2019). However, these studies appear to suffer from some weaknesses. For example, Ryan (1997) only reviewed RD research up to the mid-1990s and only those papers relating to equity risk within financial institutions. The review is currently well outdated, and seems less relevant to current researchers as new regulations and accounting standards have been developed significantly since the 1990s. Similarly, Ryan (2012) surveyed empirical studies on RD, but his study only focused on the relevance of firms' RD and how policymakers can encourage firms to improve RD quality. In addition, he only reviewed studies relating to financial instruments within financial institutions. Meanwhile, Khlif and Hussainey (2016) conducted a meta-analysis review of 42 RD studies that empirically examined how corporate characteristics could affect RD. However, their review did not include studies that examine the governance determinants and value-relevance of RD, as well as studies conducted within financial institutions. Elshandidy et al.'s (2018a) review covered a limited number of RD studies, consisting of only 32 studies between 1999 and 2016. The authors classified these studies into just two main themes: (i) studies that examined the incentives of RD; and (ii) those that examined the RD informativeness. Finally, Tahat et al. (2019) reviewed just 19 studies conducted within financial institutions. However, they failed to identify and review theoretical studies (e.g., resource dependence theory and institutional theory).

To overcome the above limitations and unlike the previous RD review studies, we review the highest number of RD studies to date. The review covers 104 studies in both financial and non-financial sectors published over the 1999–2019 period in 51 top-ranked journals. Specifically, we classify the sampled studies into six different themes: (i) RD practices and characteristics; (ii) determinants of RD; (iii) consequences of RD; (iv) compliance with RD regulations; (v) new disclosure measurement methods; and (vi) disclosure on internal controls and risk management systems. Thus, despite our multi-disciplinary focus, we explore the development of a broad range of theoretical perspectives instead of only concentrating on a few, such as resource and agency theories, and highlight the emerging theories in this field of research. Furthermore, this review focuses on different aspects of RD research covered by past studies, including RD measurements, contexts, and constructs along with identifying and discussing avenues for future research in these areas.

The remainder of the study is organized as follows. Section 2 explains the methodology. Section 3 presents the systematic literature review that covers 104 studies. Section 4 discusses

financial versus non-financial institutions RD research**.** Section 5 discusses the study's implications. Section 6 presents the literature gaps and offers new directions for future research, while Section 7 concludes.

2. Methodology

We follow two key studies that provide guidelines on how to prepare a creative systematic review study. Tranfield et al. (2003) provide a methodology to conduct a systematic review in management studies, and Short (2009) similarly presents creative suggestions on how to conduct a review study. Tranfield et al.'s (2003) methodology is followed by some studies, such as and Beer and Micheli (2018) and Franco-Santos and Outlay (2018). Tranfield et al.'s (2003) methodology explains three stages that can be followed to conduct a review study, which we have applied in this study: (i) *planning a review;* (ii) *conducting a review, and* (iii) *reporting & dissemination.* The planning stage starts by elaborating on the need for this review. After a careful review of the disclosure literature, we found only five review studies with significant limitations, which reveals an urgent need for a comprehensive systematic review of the existing literature. Table 1 compares the five extant review studies to our study to highlight similarities and differences.

Insert Table 1 about here

Another step of the planning stage is to develop a review protocol. Transfield et al. (2003, p. 215) stated: "The protocol is a plan that helps to protect objectivity by providing explicit descriptions of the steps to be taken." Accordingly, we construct a six-step protocol, as shown in Figure 1. The first step is to create a search list of the relevant RD keywords. The constructed list includes "*Risk Disclosure, Risk Reporting, Risk Information, Risk Dissemination, IFRS 7, GAS 5, FRR No. 48, Pillar 3 of Basel 2 Accord, Disclosure on Weaknesses of Internal Control and Risk Management Systems,* and *Financial Reporting of Risk".* These keywords are the most commonly used in the RD literature. We also review the lists of references at the end of the reviewed sample to pick up any related study. Next, we searched for related articles on the websites of databases and search engines using keywords identified in the pre-determined search list. We depended on two leading search engines (https://www.google.com and https://scholar.google.com/ in addition to several common databases, such as *Emerald, ScienceDirect, IEEE Explore, JSTOR, SpringerLink, Wiley Online Library,* and *ProQuest*.

Insert Figure (1) about here

The third step is to determine the selection criteria to identify which studies to include, where five criteria have been set and applied. *First*, RD should be a central focus of the study.

Second, the study should be published in an Online Research Journal, where online-published papers, e-theses, or SSRN studies are excluded. *Third*, the study should be written by academic researchers (i.e. studies published by professional bodies are excluded). *Fourth*, the study should be written in English. Finally, to ensure the quality of the review studies, we only choose studies published in journals listed in the AJG2018 Journal Quality guide, whereby all journals should be given a rank from 1 as the lowest to 4* as the highest quality, both the 4 and 4* are given the same weight.

These criteria are set to ensure a comprehensive and quality review of RD studies. We focus only on studies published in academic journals. We also exclude working and unpublished studies because these papers are at an early stage and were subject to many revisions by the authors. This was in line with Habib (2012) who excluded working and unpublished papers, stating that these papers are not adequately reviewed. Moreover, we exclude the research papers published by professional bodies, since these studies were not subject to strict reviews like academic studies.

The second stage, *conducting the review*, includes a systematic and comprehensive search process, selection of studies, assessment of studies quality, and insights extraction. We were keen to find and download the full text of each selected study and save it in a folder. The final stage of the review process was *Reporting and Dissemination*, as shown in Figure (1).

3. The Systematic Literature Review Outcomes

The outcomes of the systematic review are presented in the next sub-sections based on eight aspects: (i) studies classification; (ii) *trend of RD research*; (iii) research impact; (iv) measurement unit; (v) theories applied; (vi) country of study; (vii) RD category; and (viii) studies' results.

3.1 Classifications of RD Studies

Table 2 exhibits the studies distributed into two groups and six different themes. The total number of studies that meet the review screening criteria is 104 studies published in 51 online academic and English Journals during the 1999–2019 period. These studies are classified into two main groups: (i) studies on non-financial institutions and (ii) studies on financial institutions. The majority of studies, 69%, examine RD using samples of non-financial institutions (72 out of a total of 104), while the remaining studies, 31%, examine RD using samples of financial institutions (32 out of a total of 104). Each group is classified into sub-groups based on the studies' research objectives and themes. The non-financial studies are classified into six different themes based on their objectives, while the financial studies are classified into four different themes. The non-financial studies examine: (i) RD practices and characteristics; (ii) RD determinants; (iii) RD

economics consequences; (iv) compliance with RD regulations; (v) proposed new model/index/ measurement methods to score the RD level; and/or (vi) the disclosure on weaknesses of internal control and risk management systems. However, the financial studies reviewed covered the first four themes only.

Insert Table 2 about here

Figure 2 shows all studies in the first chart, the non-financial studies in the second chart, and the financial studies in the third chart. The first chart shows that up to 40% of all studies (42 out of 104) examine the RD determinants, followed by 29% (30 studies out of 104) that examine the RD economic consequences Moreover, 14% of studies examine RD practices and characteristics, while 7% of studies examine disclosure on weaknesses of internal control and risk management systems. The second and third charts show that 43% of the non-financial studies (31 studies out of 72) examine determinants of RD, compared with 34% of the financial studies that examine the determinants of RD (11 studies out of 34). For the third theme, 25% of the non-financial studies (18 studies out of 72) explore the RD economic consequences compared with 38% of financial studies (12 studies out of 32) that examine RD economic consequences in the financial sector. For the fourth theme, 7% of the non-financial studies examine compliance with RD regulations (5 studies out of 72), compared with 6% in the financial sector (2 studies out of 32). Figure 2 also shows that the disclosure on weaknesses of internal control and risk management systems is explored in the non-financial institutions in seven studies representing 7% of the non-financial studies, while no study was found to examine the same theme in the financial institutions.

Insert Figure 2 about here

These results imply that researchers have examined the determinants and effects of RD disclosure extensively. Therefore, more attention should be paid to the less examined themes such as the compliance with RD regulations and disclosure on weaknesses of internal control and risk management systems, particularly in the financial sector. Moreover, only three studies propose a model or a new method of disclosure measurement – namely, Beretta and Bozzolan (2004), Abraham and Shrives (2014), and Ibrahim and Hussainey (2019). The common motivation of the RD determinants' studies, such as those of Linsley and Shrives (2006), Abraham and Cox (2007), Dobler (2008), Ntim et al. (2013), and Elshandidy et al. (2015), is to answer the question: *What* triggers the disclosure of corporate risk information? They explore the effects of effective corporate governance systems and corporate characteristics on the manager's decision to disclose high-quality

risk information. The motivation of the RD consequences studies, such as Rajgopal (1999), Kothari et al. (2009), Heinle and Smith (2017), Tan et al. (2017), and Kim and Yasuda (2018), is to provide empirical evidence on the economic feasibility of disclosing higher quality risk information that could motivate managers to disclose more risk information.

3.2 Trend of RD Research

Figure 3 shows the historical development of RD research published during the period 1999-July 2019. The year with the highest publications is 2015 with 11 studies (e.g., Elshandidy et al. 2015; Elshandidy and Nier, 2015; Moumen et al. 2015; Filzen, 2015; Elbannan and Elbannan, 2015), followed by 2016 and 2007 with eight studies each. Moreover, 52 studies are published during the last 7.5 years (2012- mid-2019), representing 50% of all studies. Besides, the total number of published studies appears to increase from one study in 2003 to four studies in 2004 to five studies in 2005 to seven studies in 2006 to eight studies in 2007 to 11 in 2015 but declined again to eight, seven and six in 2016, 2017, 2018, respectively, and to three in mid-2019. Moreover, Figure 3 shows that there were no publications on RD on financial institutions in 1999, 2000, 2003, 2007, and 2019 but that, overall, 32 studies are published on financial institutions during the remaining years.

Insert Figure 3 about here

The very early studies in RD are these of Solomon (1999), Rajgopal (1999), and Roulstone (1999), and Solomon et al. (2000). Both Solomon (1999) and Solomon et al. (2000) used a questionnaire methodology to explore RD in the UK. Institutional investors are found to ask for more risk information on how firms manage risks; use corporate reports to find risk information; and prefer the voluntary format. Moreover, Rajgopal (1999) examined disclosure on the market risks imposed by FRR No. 48 in the USA during 1993-1996. They found that RD is correlated to the oil and gas price sensitivity. Likewise, Roulstone (1999) explored the disclosure on market risks imposed by FRR No. 48 during 1996-1997 in the USA. The results indicate that most sample firms disclose quantitative and qualitative information on market risks.

On the other side, the most recent studies are these of Kang and Gray (2019), Ibrahim et al. (2019), and Ibrahim and Hussainey (2019). Kang and Gray (2019) investigated 185 financial and non-financial firms listed on the London Stock Exchange (LSE) during 2013-2014. They found that multinational firms may not disclose additional voluntary risk information if are operating under higher level country-specific risks.

Ibrahim et al. (2019) investigated a sample of Saudi Arabia non-financial firms and found that some corporate governance mechanisms such as CEO-chairperson separation and audit committee effectiveness positively affect RD level. The most recent study by Ibrahim and Hussainey, published in July 2019, discussed the different concepts of Risk and presented a RD concept that complies with the risk pre-modern view, where risk should only cover the negative outcomes.

Figure (4) exhibits the trend of RD Research Themes during 1999- 2019. The research on RD determinants (Orange line) shows an upward trend from 2003-2004 to 2015-2016 with 10 studies before going down to only 6 during 2017-2019, while the research on economic consequences of RD (Gray line) shows an upward trend from 2011-2012 to 2017-2019 with 7 studies. The trends of other research themes look mixing and show between zero and four studies.

Insert Figure 4 about here

3.3 RD Research Impact

The research influence of the reviewed studies is assessed using two approaches. Firstly, the quality of the journal where the paper is published is reviewed where the journal quality guide (AJG2018) published by the Chartered Association of Business Schools (CABS) is used. Secondly, the citations metric of every paper is used based on google scholar at a specific point of time.

3.3.1 Articles' Research Impact (Journal Quality)

Table 3 exhibits 104 studies published in a total number of 51 journals with rankings ranging from 1* as the lowest rank up to 4* as the highest quality rank. For example, 14 studies (13%) out of 104 are published in 4* journals, 37 studies (36%) are published in 3* journals, 38 studies (37%) are published in 2* journals, and 15 studies (14%) are published in 1* journals. These figures imply that 50% of the review studies (52 studies) are published in top ranked-journals (3* and 4*) journals. At the journal level, the *British Accounting Review* has the highest number of publications with eight studies, followed by *the International Journal of Accounting,* and *Managerial Auditing Journal* with six studies each, and then the *Accounting Review*, *Review of Accounting Studies* and *International Review of Financial Analysis* with five studies each. This indicates that 35% of studies (36 studies) are published in these six journals.

Insert Table 3 about here

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Table 3 exhibits studies published in four top-ranked journals; while 12 out of the 14 are done on USA samples. First, five of these studies are published in the *Accounting Review*. The early three studies are those of Rajgopal (1999), Linsmeier et al. (2002), and Jorion (2002). Rajgopal (1999) was the first RD study published in the *Accounting Review* with citations of 236 since its publication. The study examines the informativeness of SEC's market RD in the USA. Linsmeier et al. (2002) was the next study that explored the influence of market RD as mandated by FRR No. 48 in a sample of USA firms during 1997-1998, while Jorion (2002) examined the Informativeness of the Value-at-Risk (VaR) format in a sample of eight banks in the USA during 1995-1999. The most recent study is that of Kothari et al. (2009) who examined the impact of disclosure on cost of capital, return volatility, and analyst forecasts in a sample of USA firms during 1996-2001. One more study published in the *Accounting Review* is that of Ogneva et al. (2007) who investigated the disclosure of weaknesses of internal controls in the USA.

The second top-ranked journal is the *Journal of Accounting Research*, which published the 2007 study of Lui and colleagues. The study examined the determinants and informativeness of disclosure of financial analysts' risk ratings in the USA. The third top-ranked journal is the *Journal of Accounting and Economics*, where the study of Doyle et al. (2007) investigated the disclosure of weaknesses of internal controls in the USA. The fourth top-ranked journal is the *Review of Accounting Studies*, where five studies were published. It is noticed that the five studies investigated USA samples. The earliest of the five studies was that of Liu et al. (2004), which explored how VaR disclosure helped predict the banks' total and priced risks in a sample of 17 commercial banks in the USA during 19997-2002. Later Kravet and Muslu (2013) explored how changes in RD could affect the stock market and analyst activity around the 10-K filings in a sample of USA firms during 1994-2007. Campbell et al. (2014) explored the information content of mandatory RD as imposed by SEC in 2005 in a sample of USA firms during 2005-2008. Hope et al. (2016) examined whether specific RD is a benefit to users of financial statements compared with generic RD in a sample of USA firms during 2006-2011. Heinle and Smith (2017) published a study on the price effects of risk information in the USA.

The last 4* journal is the *Journal of Financial Intermediation* where two studies on the banking sector were published in 2006 and 2018. The early study is that of Nier and Baumann (2006) who examined the market discipline and its effectiveness using a sample of 729 banks in 32 countries during 1993-2000. The recent study is that of Abbassi and Schmidt (2018), who examined RD in all banks in Germany using the IRB approach during 2008-2012.

At the 3* ranking level, six studies were published in the *International Journal of Accounting*. The early studies published in that journal are Beretta and Bozzolan (2004) and *Ahmed et al. (2004),* while the study of Elshandidy and Shrives (2016) is the most recent. Beretta and

Bozzolan (2004) suggested a RD framework and an index to improve the measurement of RD while Elshandidy and Shrives (2016) investigated determinants of RD (environmental incentives) and the influence of RD on market liquidity and investor-perceived risk in a sample of non-financial German institutions during 2005-2009.

Moreover, eight studies were published in the *British Accounting Review,* Solomon (1999) and Solomon (2000) were the first studies published in the *British Accounting Review* on RD. The two studies used a questionnaire as a research method and approached institutional investors in the UK to discover their attitudes towards RD in their requirements for more disclosure on RD. Afterwards, the study of Linsley and Shrives (2006) was published in the same journal, where many studies have followed Linsley and Shrives (2006) to define and measure RD level in annual reports. In April 2019, Kang and Gray (2019) investigated the country-specific risks in the voluntary disclosure of a sample of British Multinational firms.

3.3.2 Articles' Research Impact (Citations)

Google Scholar publishes statistics on the citations of articles, yet it cannot be used solely to evaluate the research impact of the review studies. Different studies are published in different years, and older studies accumulate more citations. To consider the time-effect, we apply the formula CPY = Citations / (2019-publication year). The calculated CPY seems fair, as the later publications are compensated for as they would have a higher CPY compared with older studies with the same citations. This formula is used in the software "*Harzing's Publish or Perish*", available from https://harzing.com/resources/publish-or-perish. Dumay et al. (2016) used the same formula to calculate CPY. Table 4 exhibits the number of citations per each study as published by Google Scholar on 5 August 2019, the citation years, and the Citations per Year (CPY) as calculated by the CPY formula. Table (4) exhibits studies ranked descending based on CPY. The total citations of the 104 studies are 13,510 over 867 citation years, which gives an average total CPY of 15.58, while the total CPY average for the non-financial studies is 15.47 and 8.04 for the financial studies.

Insert Table 4 about here

Panel (A) of Table 4 shows that the six most cited non-financial studies are: Doyle et al. (2007), Kothari et al. (2009), Ge and McVay (2005), Campbell et al. (2014), Linsley and Shrives (2006), and Ogneva et al. (2007). The CPYs of these studies are the highest: 115, 68, 61, 56, 44, and 43, respectively. The total CPYs of the six studies represent 35% of the total CPY of the non-financial studies and 28% of the total CPY of all studies.

The most cited study, Doyle et al. (2007), investigated the disclosure on weaknesses of internal controls in a sample of USA firms during 2002-2005. The second most cited study, Kothari et al. (2009), investigated how disclosure could affect the cost of capital and analysts forecasts in the USA. The third most cited study, Ge and McVay (2005), investigated the disclosures on weaknesses of internal controls as imposed by SOX 2002 in the USA. The fourth most cited study, Campbell et al. (2014), explored the mandatory RD as imposed by SEC 2005 using a sample of USA firms. The fifth most cited study, Linsley and Shrives (2006), presented a definition of RD and explored some determinants of RD using a sample of UK firms. Finally, Ogneva et al. (2007) explored a USA sample and concluded that disclosure of internal control weaknesses is not associated with the cost of equity. Table 4 shows that the most recent non-financial studies are not cited, such as Ibrahim and Hussainey (2019), Ibrahim et al. (2019), and Kang et al. (2019).

Panel B of Table 4 shows the CPYs of the financial studies. The studies of Nier and Baumann (2006), Perignon and Smith (2010), and Jorion (2002) are the top-cited financial studies with CPYs of 52, 38, and 20, respectively, representing 41% of the total CPY of financial studies. The most cited financial study, Nier and Baumann (2006), explored 729 banks during 1993-2000 in 32 countries to find out whether the market discipline is an effective RD mechanism. The second most cited financial study, Perignon and Smith (2010), explored 60 international commercial banks in the USA during 1996-2005 to evaluate the quality and quantity of VaR disclosures. The third most cited financial study, Jorion (2002), explored a sample of eight banks in the USA during 1995-1999.

The most recent but non-cited financial studies are Elshandidy et al. (2018b), Al-Hadi et al. (2017b) and Malafronte et al. (2018). Elshandidy et al. (2018b) explored 100 financial institutions in China during 2013-2015 to find out the determinants of RD quality and its impact on market liquidity. Al-Hadi et al. (2017b) examined RD the effect of corporate governance systems on market RD in GCC countries, while Malafronte et al. (2018) examined RD and its effect on the stock return volatility and firm value in European insurance firms.

3.4 Frequency Distribution of Studies by RD Measurement Unit

Figure 5 shows the studies' allocation based on different units used to measure the RD score, such as word, page, or index. Twenty-three studies use a manual index and checklist of items to manually score the RD level, from which 12 non-financial studies use an index. For example, Lopes and Rodrigues (2007) used a self-constructed index consisting of 54 items, including disclosures on derivatives' risks, interest rate risks, and credit risk. However, Marshall and Weetman (2007) used a coding checklist based on responses to a list of items of a questionnaire.

Tauringana and Chithambo (2016) used an index to examine the compliance with IFRS 7 requirements, while Deumes and Knechel (2008), Hassan (2009), Taylor et al. (2010), and Tan et al. (2017) used different types of indices. For the financial institutions' studies, 11 studies use an index to measure RD level. For example, Malafronte et al. (2018) used a self-constructed index consisting of 30 items. Barakat and Hussainey (2013) used a self-constructed index consisting of 14 main items comprising 56 sub-items. Nier and Baumann (2006) used an index consisting of 18 categories of RD related to the banks' risk profile. Finally, Elbannan and Elbannan (2015) used an aggregate index of four indices covering four types of risk and 17 risk items.

Insert Figure 5 about here

The disclosure level can be measured using the number of keywords, sentences, pages, or a mix of these measurement units. Figure 5 exhibits that 12 studies use the word as a measurement unit. Moreover, nine studies examined the RD level in the non-financial institutions using the word as a measurement unit (e.g., Ge and McVay, 2005; Miihkinen, 2012; Miihkinen, 2013; Campbell et al. 2014; Dominguez and Gamez; 2014; Abdallah et al. 2015; Martikainen et al. 2015; Filzen, 2015) while Three studies examined the RD level in the financial institutions using the word as a measurement unit (Al-Maghzom et al. 2016; Woods and Marginson, 2004; and Adelopo, 2017).

The risk-related sentence is found as the common measurement unit, where 36 studies (35%) out of 104 use it to measure the RD level, 29 studies use risk-related sentences to measure RD levels in the non-financial institutions, such as Abraham and Cox (2007), Linsley and Lawrence (2007), Greco (2012), and Ntim et al. (2013), and seven studies use this measure of RD levels in financial institutions (e.g., Hodder and McAnally, 2001; Linsley et al. 2006; Oliveria et al. 2011b; Maffei et al. 2014; Al-Hadi et al. 2016; Al-Hadi et al. 2015; Elshandidy et al. 2018b).

However, only two studies measure the RD level in financial institutions using a page as a measurement unit. Bischof (2009) examined RD in 171 commercial banks in 28 European countries during 2006-2007 using the number of pages as a measurement unit for the RD level. The results indicated that the length of the report increased from 81.9 to 91.6 pages in the first year of IFRS 7 adoption. Akhigbe and Martin (2008) examined 201 financial services institutions in the USA in 2002 using the number of footnote pages to the total number of pages in the annual report as a measurement of disclosure level. Another set of studies uses a mix of measurement units, such as Helbok and Wagner (2006) and Savvides and Savvidou (2012) in financial institutions; Helbok and Wagner (2006) used word, page, and an index to measure the RD level, while Savvides and Savvidou (2012) used a mix of measures to measure RD level in 30 banks in 10 different countries during 2008.

The other three studies use a mix of words and sentences to measure the RD level. Kim and Yasuda (2018) used keywords and sentences to measure RD level in a sample of Japanese firms, while Kothari et al. (2009) used a mix of words and sentences to measure RD in a USA sample during 1996-2001. Lajili and Zegal (2005) used a mix of words and sentences to measure RD level in a sample of Canadian firms. Finally, we could not determine the measurement unit of 48 studies where 31 involve non-financial institutions, while the remaining 17 involve financial institutions. Some of these studies use a method that does not require disclosure counting. For example, Iatridis (2008), El-Gazzar et al. (2011), and Sun (2015) used a dummy variable that equals one for the risk disclosers, other studies such as Roulstone (1999) used a checklist and did not use a measurement unit, while Frolov (2006) conducted a survey study, and Chipalkatti and Datar (2006) conducted an event study.

3.5 Frequency Distribution of Theories

Figure 6 exhibits 24 theories stated in the review studies with a frequency of 117 times across 58 studies, with a percentage of 56% of all studies. Hoque (2014) argued that most academic journals do not accept manuscripts that do not link their work to a theory; however, less than half of the review studies (46 studies with a ratio of 44%) do not mention any theory at all (27 studies are conducted on non-financial institutions, and 19 studies are conducted on financial institutions).

Insert Figure 6 about here

Figure 6 shows agency theory as the most common theory, with 32 studies (31%). Another 25 studies examine this theory from the RD perspective in non-financial institutions (e.g., Lajili and Zegal, 2005; Elzahar and Hussainey, 2012; Tauringana and Chithambo, 2016), while seven studies examine the theory in financial institutions; such as Helbok and Wagner (2006), Barakat and Hussainey (2013), and Elshandidy et al. (2018b). For example, Elshandidy et al. (2018b) used agency theory to explain the determinants of RD quality and its impact on market liquidity in China, while Neifar and Jarboui (2018) used agency theory to explain the impact of CG mechanisms on operational risk voluntary disclosure in a sample of 34 Islamic banks during 2008-2014. In the non-financial sector, Abraham and Cox (2007) used the agency theory to explain the RD level and governance, while Tan et al. (2017) examined and explained the effects of RD on shares synchronicity using the agency theory.

The popularity of agency theory in the RD research may reflect the fact that the relationship between financial reporting, information asymmetry, and agency costs is much more evident, and stronger, than it is with any other theory. We found that the signalling theory is the second most

frequent theory in the review studies as well, with a frequency of 19 times, where 15 studies on non-financial institutions such as Rajab and Handley-Schachler (2009), Elzahar and Hussainey (2012), Elshandidy et al. (2013), Khlif and Hussainey (2016), Elshandidy and Neri (2015), and Allini et al. (2016) have used the theory. Moreover, four studies on financial institutions have employed the theory – namely, Helbok and Wagner (2006), Linsley et al. (2006), Al-Maghzom et al. (2016), and Elshandidy et al. (2018b). Elshandidy et al. (2018b) used the theory besides agency theory to explain the determinants of RD quality and its impact on market liquidity. This theory is relevant to RD as well, where one of its arguments is that managers could send signals about risks they face to change, confirm or correct perceptions of the interested parties about risks (Spence, 1973; Elzahar and Hussainey, 2012). The theory also explains that managers may use disclosure to send signals to distinguish their performance from others.

The next most frequent theory is legitimacy theory, where nine studies are found to mention it. The theory argues that the management could be incentivised to release additional disclosure so that their firms would look more legitimate and socially responsible. Barakat and Hussainey (2013) used that theory to explain the determinants of RD quality in the banking sector, while Oliveria et al. (2011b) used that theory to explore the RD drivers in a sample of banks in Portugal. Other studies used the theory to explain the managers' decisions of RD in the non-financial institutions, such as Ntim et al. (2013), Oliveria et al. (2011a), Lopes and Rodrigues (2017), Mokhtar and Mellett (2013), and Tauringana and Chithambo (2016).

On the other hand, the disclosed information could be misused, causing proprietary costs, as argued by proprietary costs theory (Abraham and Cox, 2014), since risk information could be sensitive, so its expected proprietary costs are high compared with the costs of other types of disclosure. Marshall and Weetman (2007) and Abraham and Shrives (2014) see that the management could be reluctant to release detailed risk information to not be misused by competitors. Moreover, eight studies employ that theory. For example, Hill and Short (2009) used the theory to explain the determinants of RD of IPO non-financial institutions in the UK during 1991-2003. Moumen et al. (2015) found that the proprietary costs could moderate the perceived RD relevance in nine MENA emerging markets. Abraham and Shrives (2014) concluded that proprietary costs could motivate managers in the UK to disclose symbolic rather than substantive information.

Finally, Figure 6 shows that 10 theories have been used in the review studies just once, such as the *Fuzzy Set Theory* (Dia and Zeghal, 2008), the *Upper Echelons Theory* (Al-Maghzom et al. 2016), the *Neo-institutional* (Elshandidy et al. 2015), the *Efficient-Market Theory* (Miihkinen, 2013), and the *Management Entrenchment theory* as mentioned by Barakat and Hussainey (2013). Moreover, arguably Hope et al. (2016) is the only disclosure study that imported a theory from

psychology (construal-level theory) to explain the economic benefits of specific risk-factors disclosures in a sample of USA firms during 2006-2011. This invites future researchers to develop RD research by employing any of these rarely used theories. Furthermore, although the capital need could be a motivation to encourage managers to improve the disclosure quality, the capital need theory is not mentioned in any of the review studies.

3.6 RD Research by Country

Table 5 shows the distribution of RD research in both developed and developing countries. The *World Economic Outlook Report* issued in 2019 was used to differentiate and classify the countries. *First*, RD is examined 168 times in 49 countries, distributed 133 times (79%) in 34 developed countries and 35 times (21%) in 15 developing countries. Moreover, RD studies cover 69% of developed countries (34 countries out of 49).

Insert Table 5 about here

Second, Panel A of Table 5 exhibits only three developed countries dominate the RD research in all countries with a percentage of 35% (59 times out of 168); the USA (28 times with a percentage of 17%), the UK (22 with a percentage of 13%), and Italy (9 times with a percentage of 5.3%). This implies that more than a third (35%) of the RD research is concentrated on only three developed countries, and the remaining two-thirds are distributed over 46 developed and developing countries. The three countries account for 45% of the RD research in the developed countries. Further, Panel (A) shows also that RD research on non-financial institutions is concentrated on only 12 developed countries, while RD research on financial institutions is distributed among 33 countries.

 Examples of studies that examine RD using USA samples are Rajgopal (1999), Hodder et al. (2001), Linsmeier et al. (2002), Ge and McVay (2005), Ogneva et al. (2007), Doyle et al. (2007), Kothari et al. (2009), Kravet and Muslu (2013), Campbell et al. (2014), Filzen (2015), Hope et al. (2016) and Heinle and Smith (2017). Examples of studies that examine RD using UK sample include Solomon (1999), Solomon (2000), Linsley and Lawrence (2007), Linsley and Shrives (2005a), Linsley and Shrives (2006), Abraham and Cox (2007), Iatridis (2008), Elshandidy et al. (2013), Elshandidy et al. (2015), Ibrahim and Hussainey (2019), and Kang and Gray (2019). Examples of studies that examine RD in Italy include Beretta and Bozzolan (2004), Greco (2012), Elshandidy and Neri (2015), and Allini et al. (2016).

Third, Panel B of Table 5 exhibits the RD research in the developing world which represents less than a quarter (21%) of the total RD research around the world (36 times out of 168) distributed

in 15 developing countries. Panel B shows also that three developing countries account for more than a third (36%) of RD research in the developing world, Saudi Arabia with a percentage of 14% (five times out of 35), Malaysia with a percentage of 11% (four times out of 35), and Kuwait with a percentage of 11% (four times out of 35). The remaining 64% is distributed between the remaining 12 developing countries.

Moreover, RD is examined in Saudi Arabia five times. Both Ibrahim et al. (2019) and Al-Maghzom et al. (2016) examined the influence of corporate governance on the RD level, but the first study examines a sample of 408 annual reports of non-financial companies during 2012-2015, while the second examines a sample of four Islamic listed banks and eight non-Islamic banks during 2009-2013. Al-Hadi et al. (2015; 2016; 2017a) examined RD in GCC countries, including Saudi Arabia. In Malaysia as a developing country, three studies examine RD in the non-financial sector (e.g., Amran et al. 2009; Othman and Ameer, 2009; Abdullah et al. 2015). In Kuwait, no study is found to examine RD in the non-financial sector, while RD in the financial sector was examined in three cross-country studies (Al-Hadi et al. 2015; 2016; 2017a). It can also be noticed in Panel B that RD research in the Arab region dominates, where seven countries out of the total 15 developing nations are Arab Countries; Saudi Arabia, Kuwait, the UAE, Egypt, Oman, Bahrain, and Qatar. The RD research in these seven countries represents 74% (24 times out of 35) of the RD research in all developing countries and 14% of the RD research in all mentioned countries.

Finally, 23 studies use international samples of more than one country to examine RD. Eight of these studies used samples of non-financial institutions (Marshall and Weetman, 2007; Dobler et al. 2011; Khlif and Hussainey, 2016; Elshandidy et al. 2015; Elshandidy and Neri, 2015; Abdallah et al. 2015; Moumen et al. 2015; Moumen et al. 2016). The remaining 15 studies use samples of financial institutions of several countries (e.g., Linsley et al. 2006; Nier and Baumann, 2006; Bischof, 2009; Barakat and Hussainey, 2013; Al-Hadi et al. 2016; Malafronte et al. 2018; Neifar and Jarboui, 2018). Moreover, Table 5 shows the non-financial institutions are examined in individual studies 60 times and in cross-country studies 11 times, while the number of times that the financial sector is examined in individual studies is 16 compared with 81 times in cross-country studies.

3.7 Frequency Distribution of Studies by RD Category

Table 6 shows the distribution of RD studies based on the RD category. Overall, Table 5 exhibits that 46% (48 out of 104) of all studies examine both voluntary and mandatory RD combined, followed by mandatory RD (35%), and followed by voluntary RD (19%). The review studies are classified into eight groups based on eight RD categories, as shown in Table 6.

Insert Table 6 about here

First, 65% of the review studies (68 out of 104) examine RD in general and do not mention a specific type of RD, such as Carlon et al. (2003), Linsley and Lawrence (2007), Elzahar and Hussainey (2012), Khlif and Hussainey (2016), Elshandidy et al. (2015), and Ibrahim and Hussainey (2019). *Second*, 17 studies out of 104 explore the disclosure of different types of market risks, such as foreign exchange risk, credit risk, and liquidity risk. Moreover, 10 of these studies explore the mandatory disclosure of market risks imposed by FRR No. 48 in the USA: Rajgopal (1999), Roulstone (1999), Hodder et al. (2001), Hodder and McAnally (2001), Linsmeier et al. (2002), Blankley et al. (2002), Jorion (2002), Liu et al. (2004), Chipalkatti and Datar (2006), and Perignon and Smith (2010). Furthermore, two studies explore the disclosure on the foreign exchange risk. Solomon (1999) explored the disclosure of foreign exchange risk management in the UK in 1996. Moreover, Marshall and Weetman (2007) investigated the voluntary information of foreign exchange risk management in two samples in the USA and the UK in 1998.

Furthermore, four studies investigate an individual type of market risks, such as the disclosure of *interest rate risks* (Ahmed et al. 2004), the disclosure of *credit risk* (Frolov, 2006), the disclosure of *risks associated with liquidity* (Asongu, 2013), and the disclosure of *risks associated with derivatives* (Yong et al. 2005). Ahmad et al. (2004) investigated the effectiveness of the risk information of interest rate in a sample of commercial banks in the USA during 1990-1997. Only one study investigates the disclosure on credit risk, where Frolov (2006) investigated a sample of banks and credit institutions in Japan in 2002. One study, Asongu (2013), examined the disclosure of liquidity risk management as imposed by Pillar 3 of the Basel 2 Accord using a sample of 20 international banks as of December 2009. Besides, Yong et al. (2005) examined the disclosure on derivatives and risk management in a sample of 146 banks in 10 Asia Pacific countries in 2002. One study examines a mix of market risks where Elbannan and Elbannan (2015) examined the RD of credit risk, liquidity risk, and interest rate risk in a sample of banks in Egypt during 2008-2011.

Third, five studies investigate the disclosure of *risks associated with financial instruments* referring to five different accounting standards. Two studies examine the RD of financial instruments as imposed by IFRS 7. Bischof (2009) examined the effect of the first-time adoption of IFRS 7 on disclosure quality in 28 European countries during 2006-2007. The average length of risk reports is found to increase significantly in the first year after IFRS 7 adoption, and the disclosure quality is found to increase in both financial statements and risk reports after the IFRS 7 adoption. Tauringana and Chithambo (2016) examined the compliance with RD requirements as imposed by IFRS 7 in Malawi during 2007-2009.

Furthermore, Woods and Marginson (2004) is the only study that examines the RD of financial instruments as imposed by FRS 13 in nine banks in the UK in 1999. Meanwhile one study by Othman and Ameer (2009) examined the RD of financial instruments and level of compliance with FRS 132 disclosure requirements in Malaysia. Finally, Lopes and Rodrigues (2007) investigated the determinants of mandatory RD on financial instruments as required by IAS 32 and IAS 39 in Portugal in 2001. It is noteworthy that IFRS 7 is the most recent accounting standard on disclosure of financial instruments that have been effective since January 2007. Further, the FRC in the UK withdrew FRS 13 and replaced it with FRS 29, which is derived from IFRS 7.

Fourth, seven studies investigate the disclosure of weaknesses of internal controls and risk management systems. Five of these studies investigate this RD type in the USA as mandated by sections 302 and 404 of the SOX Act (Ge and McVay, 2005; Ogneva et al. 2007; Doyle et al. 2007; El-Gazzar et al. 2011; Sun, 2015). One study, Deumes and Knechel (2008), investigated the voluntary disclosure on the internal controls and risk management systems in the Netherlands, while Hill and Short (2009) investigated risk-warning disclosures including disclosure on internal control weaknesses in a sample of UK firms during 1991-2003. No study is found to examine such RD in the financial sector. *Fifth,* two studies examine the RD as imposed by the 2005 SEC Updates in the USA. Campbell et al. (2014) examined the informativeness of mandatory RD imposed by the SEC in 2005 using a sample of 9,076 firm-year observations during 2005-2008. Filzen (2015) also examined the informativeness of RD as mandated by SEC 2005 updates in a sample of USA firms. This study is one of the rare studies that used Python programming language to gather risk factors from the 10-Q Filings. *Sixth*, two studies by Oliveria et al. (2011b) and Neifar and Jarboui (2018) examined the voluntary operational risk on two banks samples one study by Fukukawa and Kim (2017) examined business risk using a sample of non-financial institutions. *Finally,* one study by Oliveria et al. (2011c) examined RD as imposed by a set of regulations such as IAS 1, IAS 30, IAS 32, IFRS 7 and Pillar 3 of the Basel 2 Accord. Lui et al. (2007), examined the disclosure of financial analysts' risk ratings based on a sample of USA non-financial institutions and concluded that analysts play an important role as providers of risk information.

3.8 Thematic Results

In this section, we present a thematic analysis of 104 studies, which are further classified into six sub-themes for discussion as illustrated in Figure 2 and Table 2. We conclude our discussions by identifying inherent limitations as well as potential avenues for future research under each sub-theme.

3.8.1 Theme (1): RD Practices and Characteristics

RD Practices and Characteristics in the non-financial institutions

Subsumed under this theme are 15 divergent studies, examining the RD practices and characteristics in non-financial and financial firms, respectively. Table 2 illustrates the summary. Focusing on the non-financial firms, the analysis suggests that these studies report significant variations in the RD level. Solomon (1999) considered institutional investors' expectations and reported that the RD level on foreign exchange risk management in the UK is lower than the institutional investor's needs. Conversely, Australian listed firms maintain higher levels (i.e. 72%) of risk information in their annual reports as noted by Carlon et al. (2003). Likewise, Lajili and Zegal (2005) found a mean of 216 words and 10 sentences in the MD&A section and 204 words and 10 sentences in the financial statements' notes in a sample of Canadian listed firms in 1999. A later study by Linsley and Lawrence (2007) on UK trading firms observed that the total number of risk sentences in a sample of UK annual reports in 2001 is 2,770.The observed levels of RD are relatively higher compared to those reported by Lajili and Zegal (2005).

Turning to the RD characteristics, we observe higher levels of similarities in the selected studies. One of the most common characteristics across sampled studies is the nature of risk information, which is more qualitative (Lajili and Zegal, 2005; Greco, 2012). Despite this, however, studies note inherent difficulties in extracting risk-related information from the annual reports and related corporate channels, Linsley and Lawrence (2007), for instance, observed that the readability of risk information is difficult and they recommend that directors increase the clarity of risk information. Considering the types of risks disclosed, Carlon et al. (2003) found that risk information disclosed in Australia is about risk management and identification of risks, whereas Dia and Zeghal (2008) found that risk information in Canada is about exchange rate risks, operational risks, and the risks associated with distribution activities and natural resources. Lajili et al. (2012) investigated executives' choices of disclosure and noted that managers tend to disclose more information on business risks relative to operational risks.

RD Practices and Characteristics in the financial institutions

Turning to the RD practices and characteristics in financial firms, the analysis based on seven distinct studies observes similar results about the RD level and quality across the sample. Hodder and McAnally (2001) analyzed the RD format of four US-based financial institutions for the year 1999 and reported that risk information presented in the tabular format improves the risk

information comparability. Likewise, Linsley and Shrives (2005b) reviewed three surveys conducted by the Basel Committee and concluded that Pillar 3 of the Basel 2 Accord may not be effective in providing a complete picture of risks facing banks. They further argued that, owing to the fears of litigation or competitors, managers may feel reluctant to disclose all the risk information they possess. Focusing on 146 banks operating across 10 Asia Pacific countries, Yong et al. (2005) observed that the average RD level in the sampled banks is 35%, which is higher in developed countries relative to developing countries. Later studies confirm these upwards trends. For instance, Perignon and Smith (2010) observed an increase in the overall level of Value-at-Risk (VaR) disclosures in the USA. Similarly, Oliveria et al. (2011c) reported upwards trends in the RD level in Portuguese firms after the adoption of IFRS. As for the nature of RD, these studies largely agree that financial institutions do not provide a high-quality RD. Frolov (2006) argued that this can largely be attributed to the banks' behavior in not explaining the underlying assumptions used in the development of risk estimates, thereby making it harder to evaluate the risk information disclosed by banks. Noting the exceptions within the field, driven by an analysis of 66 Italian banks for the year 2011, Maffei et al. (2014) submitted that the RD narratives were uniform, equal, and non-financial and that the RD of Italian banks complies with the Italy Central Bank regulations.

One of the primary limitations of this group of studies is that they merely remain focused on RD practices and its characteristics without accounting for the motives behind the managers' decisions to improve RD practices or quality. Notably, these studies do not consider the potential effects of firm characteristics in determining the extent, quality, content, and characteristics of the risk information disclosed. Most of the examined characteristics are related to time orientation and readability, and no study have been found to examine the RD characteristics with reference to the qualitative characteristics of useful accounting information as presented by the accounting conceptual framework. Besides, most of the studies are found to examine RD practices based on the level of disclosure rather than the quality. Future research may consider these aspects and fill this gap in the RD literature.

3.8.2 Theme (2): Determinants of RD Quality

Determinants of RD Quality in the non-financial institutions

A key question addressed by the RD literature is: What drives some managers to disclose more risk information voluntarily while others disclose less or are reluctant to disclose any risk information at all? A set of studies try to answer this question by examining the influence of corporate governance on the managers' decision to disclose high-quality RD, while another set of

studies try to answer the question by examining the influence of corporate characteristics. The results of the first group on the influence of corporate governance are a bit competing. For example, Abraham and Cox (2007) discovered that independent directors on boards have a substantial positive association with RD. Similarly, while audited by the Big-4 firms, Oliveria et al. (2011a) found that RD levels rise in organisations with a higher proportion of independent directors. Ntim et al. (2013) found that board diversity, board size, and independent directors all improve RD levels, while Elshandidy et al. (2013) discovered that companies with higher board independence and effective audit environments have higher aggregated RD levels, and Elshandidy and Neri (2015) found that independent directors on boards improve both voluntary and mandatory RD. However, a few studies found this relationship insignificant such as Elzahar and Hussainey (2012) and Dominguez and Gamez (2014).

A related strand considering the effects of corporate board size in explaining the RD practices argues that board size explains variations in RD level with larger board promoting higher RD level and quality (see, Ntim et al. 2013; Mokhtar and Mellett, 2013; Elshandidy and Neri, 2015; Moumen et al. 2016). However, Elzahar and Hussainey (2012) and Allini et al. (2016) found no significant relationship. Audit quality is yet another determinant of RD. Consistent with the agency perspective, Lopes and Rodrigues (2007), Oliveria et al. (2011a), and Mokhtar and Mellett (2013) argued that the auditor type is one of the key determinants of RD – i.e. having a Big-4 auditor improves RD level and quality. In other constituents of audit, Oliveria et al. (2011a) and Allini et al. (2016) found no significant role for the audit committee in improving RD. However, in a recent study exploring the effects of corporate governance features on RD in Saudi Arabia, Ibrahim et al. (2019) found that CEO-Chairperson separation and government ownership positively influence RD level, offering a divergent view to the earlier findings of Moumen et al. (2016).

A related literature stream exploring the corporate characteristics as determinants of RD quantity and quality reports mixed results. Guided by the agency and resource dependency perspective, a clear majority of empirical studies argue for firm size as one of the main determinants or RD. These studies reason that larger corporates with abundant resources and a larger shareholder base are required to provide more information to mitigate the information asymmetry as well as to sustain investors' confidence (Watts and Zimmerman, 1983). These arguments are further extended by the stakeholders' theory, which hypothesizes that managers of large organizations are expected to satisfy diversified stakeholders relative to their counterpart representing smaller firms. Numerous empirical studies support these theoretical arguments, demonstrating a positive relationship between firm size and RD level and quality (Linsley and Shrives, 2005a; Linsley and Shrives, 2006; Iatridis, 2008; Elzahar and Hussainey, 2012; Elshandidy et al. 2013; Amran et al. 2009; Taylor et al. 2010;

Allini et al. 2016; Marzouk, 2016). Constrained by the statistical significance, a few studies remain inclusive on the said association (e.g., Hassan 2009; Rajab and Handley-Schachler, 2009).

The company risk exposure is another determinant of RD. While earlier research, such as Linsley and Shrives (2005a) and Konishi and Ali (2007), found no effect of risk level on RD level, more recent research contradicts this. According to Elshandidy et al. (2013), companies with higher levels of various sorts of risks supply larger amounts of aggregated and voluntary RD.

Firms operating in various segments of the economy face different risks, which has direct implications for their RD practices. RD literature has considered industry type as a determinant of RD. Informed by the signalling theory, Elzahar and Hussainey (2012) argued that firms operating in different industries face unique constraints; therefore, significant differences in the RD nature and levels are inevitable. Following these logics and theoretical reasonings, empirical evidence (Hassan, 2009; Rajab and Handley-Schachler, 2009; Amran et al. 2009; Elzahar and Hussainey, 2012) finds a significant positive relationship between RD and industry type apart from Marzouk (2016) who reported insignificant results.

Similarly, cross-listing is another corporate characteristic that is explored by RD literature. According to the signalling theory, cross-listed corporations are more inclined to provide positive signals about the risks they face and to reveal risk mitigation techniques to make their securities more appealing in international markets (Elzahar and Hussainey, 2012). The empirical data on this premise is contradictory. Cross-listing and RD level were found to have a substantial positive association by Lopes and Rodrigues (2007), Abraham and Cox (2007), and Rajab and Handley-Schachler (2009). However, no significant influence was found by Konishi and Ali (2007), Elzahar and Hussainey (2012), and Marzouk (2016). Finally, leverage as a corporate factor of RD is investigated. According to the agency theory, highly leveraged corporations may incur higher agency costs due to creditors, and that additional information may reduce these costs (Jensen and Meckling, 1976). As a result, leverage is expected to be a positive determinant of RD. The literature, on the other hand, yields mixed results. Deumes and Knechel (2008), Iatridis (2008), Taylor et al. (2010), and Oliveira et al. (2011a) discovered a positive significant relationship between firm leverage and RD, whereas Linsley and Shrives (2005a), Rajab and Handley-Schachler (2009), Dominguez and Gamez (2014), and Allini et al. (2016) found no statistical significance to support or refute these findings.

Determinants of RD Quality in the financial institutions

Turning to the financial firms, three studies explore corporate governance mechanisms as determinants of RD and find a positive effect (Barakat and Hussainey, 2013; Al-Hadi et al. 2016;

Al-Maghzom et al. 2016). Barakat and Hussainey (2013) found that outside board directors, active audit committees, concentrated outside non-governmental ownership, and the existence of powerful independent bank supervisors are positive determinants of RD quality. Likewise, Al-Hadi et al. (2016) found that risk committee size, qualifications, and independence are positive determinants of RD quality. Al-Maghzom et al. (2016) reported that outside ownership, the frequency of meetings of the audit committee, and board gender are positive determinants of RD level, while board size is found to be a negative determinant. On profitability, Helbok and Wagner (2006) found a negative relationship with RD; Al-Maghzom et al. (2016) found a positive relationship, while Linsley et al. (2006) found no relationship. For the bank size, Linsley et al. (2006), Savvides and Savvidou (2012), and Al-Maghzom et al. (2016) confirmed a significant positive relationship between bank size and RD level. In region-based studies, Al-Hadi et al. (2017b) found a positive influence of a strong governance system on the RD level in a sample of GCC firms. Focusing on a sub-set of banking – i.e. Islamic banking and finance – Neifar and Jarboui (2018) explored 34 Islamic banks in various countries during 2008-2014. and reported that independent directors have a significant impact on operational RD, while the Shariah Supervisory Board and the external auditor type are found to influence the operational risk information significantly. Further to this, Elshandidy et al. (2018b) explored several determinants of RD quality in a sample of Chinese financial listed firms during 2013-2015 and reported that firm size influences the RD practices, while Abbassi and Schmidt (2018) found a positive influence of risk exposure on the RD level in a sample of German banks. Overall, investigating the corporate governance role in improving RD is rare in the financial and banking sector, which invites future research to investigate this issue.

While the afore-cited literature has considered a wide range of corporate governance features and firm-level attributes in relation to RD, research has largely ignored the role of top executives such as the CEO who is responsible for implementing the corporate strategies, including those related to the RD. CEOs' demographic characteristics and organizational preferences such as tenure, experience, compensation, age, risk orientation, gender, education and other personal characteristics would have direct implications for the corporates' RD practices. Future research can consider the effects of CEO profiles on RD strategies.

Another important determinant that has not been considered adequately by the existing literature is the existence and nature of RD regulations. Whether the RD level and quality varies if imposed regulations are mandatory or voluntary in nature remains largely unexplored. For example, the USA and Germany have mandatory RD regulations whereas, in the UK, most regulations are voluntary. Furthermore, the effects of regulations on the RD quality at an international level has not been examined either. For example, the role of monitoring bodies such as Shariah Supervisory

Board in Islamic banking and finance industry should be further investigated. These are some potential areas of research interests that we identify, and we encourage future researchers to consider these key aspects when studying RD.

3.8.3 Theme (3): Economic Consequences of RD

Economic Consequences of RD in the non-financial institutions

The usefulness and economic benefits of RD are well debated in the RD literature streams (e.g., ICAEW, 1997; 1999; 2002; 2011; Kothari et al. 2009; Miihkinen, 2013; Moumen et al. 2015). However, the empirical evidence on the economic consequences of RD quality and the variables affecting its economic usefulness are scarce. Miihkinen (2013) recognized that the disclosure literature provides poor empirical evidence on the economic consequences of RD quality and further argues that empirical evidence of the usefulness of RD potentially inspire directors, managers, and regulators to consider the RD quality when preparing annual reports and in setting the accounting regulations. This justifies the invitation of recent studies such as Kravet and Muslu (2013), Miihkinen (2013), Campbell et al. (2014), Khlif and Hussainey (2016), Sun (2015), and Ibrahim et al. (2019), who call for the economic consequences of RD to be examined.

Table 2 shows that a quarter of non-financial studies examine the economic consequences of RD (18 studies out of 72 while 10 of these studies draw their sample from US-based firm). The USA is considered a leading country and it is among the countries that issued and applied RD regulations, such as the FRR No. 48 (Disclosure on Market Risks), and the 2005 SEC updates. Rajgopal (1999), Hodder et al. (2001), and Linsmeier et al. (2002) examined the economic usefulness of market risk information disclosed in the 10-K Filings in the USA as mandated by the FRR No. 48. Likewise, Campbell et al. (2014) and Filzen (2015) examined the economic consequences of risk information mandated by the 2005 SEC Updates in the USA, while Lui et al. (2007), Kothari et al. (2009), and Kravet and Muslu (2013) assessed the economic usefulness of RD in general in the USA. Furthermore, Moumen et al. (2015) exceptionally studied the usefulness of RD in a cross-country sample while examining the future earnings prediction with reference to voluntary RD and reported that voluntary RD in MENA countries improves the markets' ability to predict two-year-ahead future earnings change. Elshandidy et al. (2016) concluded that risk information could improve market liquidity and reduce investor-perceived risk in a sample of German listed firms during 2009-2009. Similarly, Hope et al. (2016) noted that more specific risk information helps analysts better assess the fundamental risk in a sample of USA firms whereas Heinle and Smith (2017) found that more risk information could reduce the cost of capital, particularly the disclosure of systematic risks, in a sample of USA firms. Tan et al. (2017) observed

that synchronicity is inversely related to the RD level in China. Later studies such as Kim and Yasuda (2018) report that mandatory RD helps improve the investors' assessment of firm risk in Japan, while Li et al. (2018) concluded that higher RD improves the corporate investment efficiency in China and that the effect is more prominent when the RD tone is more positive.

Common recommendations derived from these studies call for more research on the economic usefulness of RD. For example, Kravet and Muslu (2013) and Campbell et al. (2014) recommended investigating the influence of RD quality on debt markets, debt pricing, and credit ratings' changes whereas Miihkinen (2013) encouraged more research on the influence of RD quality on information asymmetry. Moreover, Sun (2015) recommended investigating the influence of disclosure on internal control weaknesses on the operating and business decisions effectiveness. Elshandidy et al. (2016) recommended using interviews and questionnaires to recognize the investors' real perceptions of the disclosed risk information, and Kim and Yasuda (2018) recommended future research to investigate the effect of RD quality on the cost of capital.

Economic Consequences of RD in the financial institutions

Table 2 exhibits 12 studies that investigate the value-relevance of RD in financial institutions with a ratio of 37.5% of the reviewed studies focus on financial institutions (12 out of 32 studies), covering the period 2002-2018. Ten of these studies provide significant evidence on the value relevance of RD, while the remaining two remain inconclusive on the usefulness of RD. Jorion (2002) and Liu et al. (2004) found that Value-at-Risk (VaR) disclosure is informative in the prediction of trading revenues variability, return variability, and total risk in the USA while Ahmed et al. (2004) alleviated concerns about the usefulness of market RD requirements in the USA, while Nier and Baumann (2006) reported that banks that disclose more information on their risk profile limit their default probability. Elbannan and Elbannan (2015) found a significant positive association between RD and operating performance and market valuation of a sample of banks and concluded that banks with a higher RD earn higher profitability and market share. On the other hand, Al-Hadi et al. (2015) reported a significant negative association between mandatory RD and the implied cost of capital. However, both Woods and Marginson (2004) and Chipalkatti and Datar (2006) found no evidence for the usefulness of RD. Woods and Marginson (2004) further intimated that RD in the UK annual reports is too general, incomplete, and difficult to use.

Furthermore, Chipalkatti and Datar (2006), who did not find statistical support for their theorem that RD explains abnormal returns, concluded that the market RD in the USA does not provide useful information to investors. Adelopo (2017), on the other hand, found that the temporal nature of RD affects firm performance differently; the study further found a negative effect of historic RD on the current and future firm performance and an opposite effect was found when examining

forward-looking narrative RD. Drawing on a research sample of 47 European insurance companies, Malafronte et al. (2018) observed a positive influence of RD on volatility, and the RD level, which translates into higher firm value.

Providing evidence on the usefulness of RD is an essential step to encourage managers and regulators to pay more attention to improving RD quality. However, this evidence is still in its infancy, considering the nature of high riskiness of banking business. Although the above-cited 12 studies provide some insights into the RD practices in the financial services firms such as banks, more evidence is required on the value-relevance of RD. Apart from a scant focus on the financial firms, these investigations have ignored certain aspects: for instance, they do not consider the effect of RD on analysts' recommendations to investors; neither do they examine the market reactions to the release of such information. To clarify this further, an event study is needed to recognize the immediate effect of risk information once released. Equally, the relative implications of RD on debt pricing and credit rating is yet another potential area for research which, to date remains unexplored. Furthermore, it also remains unclear how users of risk information perceive and use risk information. Finally, future research could gauge the perceived benefits of RD for those who request such information and may adopt a qualitative research approach to gather such information via interviews or by administering a questionnaire.

3.8.4 Theme (4): Compliance with RD Regulations

Compliance with RD Regulations in the non-financial institutions

Table 2 shows that five studies examine the compliance level with the RD mandatory regulations using samples of non-financial firms. Three studies investigate the firms' compliance level with the market RD regulations: Roulstone (1999), Blankley (2002), and Othman and Ameer (2009). Both Roulstone (1999) and Blankley et al. (2002) noted reasonable improvements – both in quality and content of disclosed information – in the market RD among US companies after the implementation of FRR No. 48. Likewise, Othman and Ameer (2009) noticed that many companies comply with FRS 132 requirements to disclose market RD in Malaysia. On the other hand, Buckby et al. (2015) investigated whether the Australian listed companies provide RD following the requirements of the governance framework imposed by the Australian Securities Exchange and reported a lower level of compliance with the requirements of the governance framework – i.e. about 50% of the sample companies do not provide disclosure on material business risks as required by the Australian governance framework. Last, Tauringana and Chithambo (2016) reported that the compliance level with IFRS 7 RD requirements among Malawian firms is 40% on average and that

the non-independent directors and firm size and leverage are positive determinants of compliance with RD imposed by IFRS7.

Compliance with RD Regulations in the financial institutions

Thus far, we find only two studies that investigate compliance with RD accounting standards and regulations drawing sample from international banks. Bischof (2009) investigated the effect of IFRS first-time adoption and compliance with IFRS 7 whereas Asongu (2013) investigated the compliance with disclosure requirements of Pillar 3 of the Basel 2 Accord. Bischof (2009) finds that banks comply with IFRS 7 and that the length and quality of risk reports increased significantly after first-time adoption of IFRS 7 in 28 EU countries. Contrarily, Asongu (2013) found no evidence of the compliance of 20 top world banks with disclosure requirements of Pillar 3 of the Basel 2 Accord even after the 2008 financial crisis. Besides, the study noted that bank executives appear to comply more with RD accounting standards such as IFRS 7 relative to the RD regulations set by the Basel Committee, hinting at the personal preferences of the bank managers.

One of the primary limitations of this group is the scarcity of studies examining compliance with RD regulations. Despite its scope and usefulness in understanding the extent to which firms comply with RD regulations, which are designed to enhance the quality of RD, only a handful of empirical enquiries have been conducted to date: five studies focusing on the non-financial firms while two studies have been conducted in the context of financial services firms.

As stated above, financial services firms are among the most regulated entities. The significance of regulations and accords is such that the IFRS 7 aims to organize the disclosure of risks associated with financial instruments in the financial sector whereas Pillar 3 of the Basel 2 Accord is developed to organize disclosure of risks in the banking industry. Despite the significance of financial services firms in acting as the lubricants within an economy, only scant attention has been paid to such organizations. Consequently, issues pertaining to RD regulations in public listed companies in general and financial services firms remain unexplored. Empirical evidence addressing fundamental questions such as to what extent banks and financial institutions comply with the requirements of RD set by these regulations remain unaddressed in the RD literature. This study attempts to draw attention of interested researchers to this substantial area of research.

3.8.5 Theme (5): A Proposed Model/Index of RD measurement

In this fifth sub-section, we discuss three distinguished studies that propose or develop a new measure of RD quality. *First,* Beretta and Bozzolan (2004) proposed and applied an index to measure the quality of RD. Their basic theorem is premised on the notion that additional attention

shall be paid to the quantifiable mechanisms behind disclosed information: rather than merely focusing on how much information is disclosed, the analysis shall conceive what information is disclosed and through what channels (the *how* part). The proposed index measures the RD from different dimensions: quantity, density, depth, and outlook. These authors argued that this index can be used to rank companies based on RD quality and further recommended applying their proposed index to investigate to what extent the RD quality be affected by the external regulations. *Second*, Abraham and Shrives (2014) developed a model to improve the value-relevance of RD in corporate annual reports, based on three research questions that can be used to assess RD quality. The authors reasoned that their proposed model provides a new perspective to measure the RD quality away from the word or sentence count. Unlike the index proposed by Beretta and Bozzolan (2004), Abraham and Shrives's (2014) model is based on two accounting theories: *proprietary costs* theory and *institutional* theory. In a third and most recent study, Ibrahim and Hussainey (2019) proposed a new definition of RD, as a set of new keywords to be used in scoring RD levels in the narratives of annual reports.

As noted in the review section above, several studies have proposed and examined different methods and techniques to evaluate the quality of financial reporting. From our review, only three studies discuss models or indices to develop the measurement of RD. Notably, the study proposed by Ibrahim and Hussainey (2019) is a standalone study that examined the measurement of RD and proposed a new definition of RD to measure RD more accurately. Despite the noted attempts, though, literature on developing RD measurement is still in the development stage and further investigations to extend and expand this line of research is timely. A plausible way forward is to consider importing techniques from other disciplines such as linguistics or computer science to help improve and facilitate the process of RD quality measurement.

3.8.6 Theme (6): Disclosure of Internal Controls Weaknesses

The disclosure on the weaknesses of internal controls and risk management systems is mandated in the USA by Sections 302 and 404 of the SOX Act. Several studies have investigated such disclosure as a risk information category. Among those, five studies focus on the USA-based firms and two others have considered firms operating in the Netherlands (Deumes and Knechel, 2008) and the UK (Hill and Short, 2009). Using a sample of US-based firms, Ge and McVay (2005) reported that such disclosure describes internal control problems, and risk in complex accounts. The study further noted that firms that disclose the material weaknesses of internal controls are those audited by the Big-4, hinting at the significance of audit quality. However, according to Ogneva et al. (2007), disclosure of internal control weaknesses is unrelated to the cost of equity in US-based firms; Doyle et al. (2007) clarified that firms that disclose material internal control weaknesses are

smaller, younger, financially weaker, more complex, and have higher growth rates and El-Gazzar et al. (2011) cautioned that disclosure on weaknesses of internal controls could downgrade the firms' debt and may affect the credit risk assessment. Echoing with the above literature, Sun (2015) concluded that disclosure of internal control weaknesses, particularly when auditors issue an adverse opinion on internal control, could affect the operating and investment decisions negatively. Unlike the previous studies that investigate mandatory disclosure, Deumes and Knechel (2008) observed a positive link between leverage and voluntary disclosure of internal control problems in the Netherlands, but a negative relationship with ownership concentration. They also stated that the level of disclosure varies depending on the firm's underlying risk exposure. Finally, Hill and Short (2009) discovered that IPO firms publish more forward-looking information but less internal control and risk management information in a sample of UK firms.

While these studies are important, they focus exclusively on non-financial firms. To the best of our knowledge, no study explores these relationships in the context of financial services firms, including banking corporations. Arguably, RD is one of the most important financial reporting categories and disclosure on the material weaknesses of internal control could be the most important risk disclosure category. For this reason, it is important that these potential research avenues be further explored by conducting empirical investigations, particularly in the financial services firms. Plausibly, having an effective management control system is likely to reduce the occurrence of any potential risks, and is likely to improve the quality of the financial reporting and communication with stakeholders. Besides, disclosure on the effectiveness of control systems could be beneficial to users to inform them on the companies' strategies, policies and controls set to manage and assess risks effectively. However, this group of studies does not provide empirical evidence on the quantity or quality of such disclosure. Given its crucial role, the disclosure of internal controls needs to be improved and extended.

4. Financial versus non-financial institutions RD research

Our review above highlighted some differences regarding RD research on both non-financial institutions and financial institutions. First, studies that focus on the textual characteristics (e.g., readability, tone, boilerplate) of RD in financial institutions are rare. Studies on RD practices and characteristics of financial institutions in developing countries are under researched. Thus, more research would be key to understand what the antecedents and consequences of these textual characteristics of RD are. Also, information related to derivatives or financial instruments' major risk types needs further exploration.

Second, literature on determinants of RD in financial institutions are rare, especially in developing countries. This strand of literature could expand by examining the influence of CEOs'

demographic characteristics and organizational preferences such as tenure, experience, compensation, age, risk orientation, gender, education and other personal characteristics on RD practices. The role of monitoring bodies such as Shariah Supervisory Board in Islamic banking and finance industry (Elamer et al., 2019, 2020a, 2020b) could be further examined. Islamic banks are exposed to more risk and make information asymmetry acute agency and legitimacy issues. Thus, future research can also delve into Shariah Supervisory Board structure and their impact on banks' and companies' overall strategic decisions toward RD. Also, future research could also look at corporate governance reforms taking place internationally and investigate how these reforms have impact on RD practices. Institutional theory may possibly be an appropriate theoretical structure for such investigations.

Third, the usefulness of RD in financial institutions is still underdeveloped (Elamer et al., 2021), considering the nature of high riskiness of banking business. Also, the reviewed literature in financial institutions have ignored certain aspects such as the impact on analysts' recommendations nor market reactions. How firms' RD would affect banks loan decision is not answered yet. Evidently, we need more analyses to determine what and how RD practices should be prioritized in the effort to alleviate the information asymmetry.

Fourth, there is limited evidence on financial institutions' compliance level with the market RD regulations. Financial institutions are subject to more strict regulations and compliance standards (Elamer et al., 2020a; 2020b). It would be interesting to better comprehend the cross-national discrepancy in compliance level with the market RD regulations in cross-country study and whether these compliance levels are partly explained by countries' political regimes or/and country governance quality. At the organizational level, future work could also investigate more questions related to Top Management Team (TMT) compensation elements in financial institutions such as base salary, cash bonuses, incentive plan compensation and stock options may drive compliance level with the market RD regulations. Furthermore, analysing the consequences of board diversity (Bufarwa et al., 2020) and RD could improve our understanding of the role of diversity in the boardroom and its subcommittees (e.g., Khatib et al., 2021).

Lastly, our review suggests that no previous research has done to proposed index or model to measure RD in financial institutions. Likewise, a potential avenue for future research would be to assess how financial institutions disclosure on weaknesses of internal controls and risk management systems could affect the quality of financial reporting in general and risk information. In fact, it is interesting that we did not discover any article dedicated to internal controls and risk management systems. Several opportunities also exist in terms of testing the effects of the moderating effect of cultural and economic traditions on RD.

Altogether, we call for future research to construct a better understanding of the role of RD in financial institutions especially in emerging economies. We similarly see avenues for future research to shed light on international governance trends, IFRS and Basel accords and how changes affect the RD quantity and quality.

5. The Study Implications

The comprehensive review we conducted has several implications for a range of interested parties. *First*, several opportunities exist for academic researchers to contribute to the measurement of RD in different contexts. As we have seen, only a few studies have been conducted on RD research in the banking sector, in developing countries, and on the value-relevance of RD. Likewise, the disclosures of weaknesses in internal control and risk management systems are rarely examined, despite their importance as RD types. Additional research could be undertaken to introduce a valid disclosure measurement for these types of RD and to examine their economic consequences. There is a possibility that the involvement of experts in linguistics in determining further RD keywords may improve the ability of computer-based content analysis for identifying RD. However, further research is needed to understand the potential contribution of linguistics experts.

Second, three implications of accounting standard setters and regulators are identified in our study. First, it emphasises that IFRS 7 is limited to the disclosure of risks related to financial instruments. However, companies face different risks, and the market participants need information on all risks not only those associated with financial instruments. Our study implies that regulators and standard setters need to take serious steps towards issuing a new accounting standard that covers most of the business risks, like GAS 5 in Germany. Future researchers may be able to contribute by examining whether a comprehensive international RD accounting standard, like German GAS 5, is needed. To do this, you should prepare interview questions and questionnaires and speak to analysts, investors, and risk managers. Second, our review implies that there is a need for a regulation that organizes the disclosures on weaknesses in internal control and risk management systems, like the SOX regulations in the USA. Third, for the Basel Committee, the risk information is so important to banks' stakeholders, because of the risky nature of banks' activity. Therefore, it is highly recommended to obligate banks to follow the RD regulations issued by the Committee, such as Pillar 3 of the Basel 2 Accord and BCBS 239. This will satisfy the stakeholders' information need, reduce the information asymmetry between managers and stakeholder and this could lead to desirable economic consequences. Research on would help to inform regulators and standard setters about the benefits of RD to stakeholders and disclosing firms.

This provides regulators and standard setters the information needed for a more informed cost-benefit analysis of RD.

Third, our review offers interesting implications for corporate managers. The review results imply that there is a theoretical and empirical consensus on the value-relevance of RD quality (e.g., stakeholders appear to be better informed by RD). Managers should recognize the different benefits that their companies could gain from disclosing high-quality risk information. They should give high priority to disclose all types of risks, that they face, in their annual report narratives. They need to avoid using complex language and boilerplate risk statements in their annual reports. They need to use RD to inform stakeholders about risks their companies face and how they manage it. They should not use RD to obfuscating stakeholders by using impression management techniques.

Fourth, governance regulators could participate in improving the RD quality by expanding the corporate governance regulations to include obligatory rules for the disclosure of risks. The UK Corporate Governance Code (2014. p. 17) obligates directors to describe in the annual reports the principal risks facing the company and obligates the board to monitor the internal control systems and report on this review in the annual report. Governance codes around the world, particularly, those in developing countries should develop and issue similar disclosure requirements like those of the UK Corporate Governance Code. These codes need also highlight the roles of audit committee and risk committee directors in overseeing RD in the narrative sections of the annual reports. This will lead to a high-quality risk information that could be relevant for stakeholders' decision-making process. Overall, all interested parties must participate in improving the RD quality, managers should recognize the value-relevance of RD and provide high-quality RD, accounting standards' setters should improve the existing RD accounting standards or issue a new specialized one, and governance regulators should improve the governance codes and issue obligatory regulations of RD to improve RD quality.

6. Literature Gaps and Research Agenda

Our review summarizes and synthesizes the RD literature. In this section, we identify several gaps in RD literature and recommend ideas for future research. *First*, the review identifies IFRS 7 as the only accounting standards that requires companies to disclose risk information related to financial instruments. To date, the only comprehensive RD accounting standard is GAS 5, which has been issued and applied in Germany. However, we find the accounting researchers tend not to investigate the issuance of a similar international and comprehensive accounting standard, or even extend IFRS 7 to cover all risks. Further research could be carried out by proposing a framework for RD standard. In this case, qualitative research methods (e.g., interviews and qualitative surveys) could be undertaken to explore the perceptions of standard setters, other regulators, corporate

managers as well as stock market participants about the proposed RD standard that covers all types of risk that companies face. It would also be interesting to factors that may affect the demand and supply of RD in annual report narratives. A cross-country study on the perceptions of a risk disclosure standard is also an interesting area for future research. To move this research agenda forward, we suggest that further research could explore RD (voluntary or mandatory) regulations have been effective in improving RD quality. *Second*, our review shows that only 31% of the reviewed studies (32 studies out of 104) use samples of banks and financial institutions, despite the fact that financial institutions are riskier than non-financial institutions. Furthermore, banks around the world apply special regulations, particularly for the disclosure of risks, such as Pillar 3 of the Basel 2 Accord. However, and based on our extensive search, only one study, Asongu (2013), examined the compliance with regulations of the Basel 2 Accord regarding disclosure of risks. This suggests that the research on compliance with RD standards and regulations is rare, and to what extent banks and institutions comply with the requirements of RD set by regulations remains a major research question. There are opportunities for future researchers to explore the compliance of banks with RD regulations of Pillar 3 and its subsequent revisions in 2009 and 2015. Moreover, an empirical comparison study between RD practices in financial and non-financial institutions to elaborate on the effectiveness of different RD regulations in both sectors could be a major contribution to RD literature.

Third, despite the importance of providing empirical evidence on the value relevance of RD, a significant paucity of empirical evidence remains. For example, we only found 30 studies that have explored the economic consequences of RD around the world. Further, 14 of these studies were done in the USA. Relevant studies, such as Miihkinen (2012), Elzahar and Hussainey (2012), Miihkinen (2013), Dominguez and Gamez (2014), Khlif and Hussainey (2016), Abdallah et al. (2015), Allini et al. (2016) and Marzouk (2016) have noticed this research gap and recommended further research on economic consequences of RD quality. Further, the studies of Miihkinen (2013) and Moumen et al. (2015) are the only two studies that explored the influence of moderator variables on the economic consequences of RD quality. This suggests that further research could consider other moderating variables, such as the existence of risk committee, the readability of annual reports, market condition, and proprietary costs. Moreover, further empirical evidence is needed on the influence of RD on bonds' ratings, share valuation, debt pricing, credit rating, firm value, cash holdings, trade credit, investment efficiency, or cost of debt. El-Gazzar et al. (2011) may be the only study that explores how RD could affect debt rating changes. Moreover, Moumen et al. (2015) may be the only cross-country study that investigates the value-relevance of RD in non-financial companies, which suggests that further cross-country studies on the value-relevance of RD will be needed in the existing literature. Further research is needed to examine the usefulness

of RD quality, particularly in the banking industry. Further research may examine how analysts and investors perceive, use, and benefit from the disclosed risk information. It would be interesting to explore whether the medium used to disclose risk information (e.g., annual reports, interim reports, corporate website, corporate social media, auditor report, conference calls and press release) affects its usefulness.

Fourth, 79% of RD research has been found to concentrate on developed countries. Three developed countries – the USA, UK, and Italy – account for approximately 35% of RD research around the world. However, RD could equally play a very effective market discipline role in the developing countries, as postulated by Elbannan and Elbannan (2015) and Pillar 3 of the Basel 2 Accord. This indicates, therefore, that further work is needed on RD in developing countries, particularly those with weak governance systems.

Fifth, although we found 24 theories that have been applied to explain managers' practices and motivations relating to RD, other relevant theories, such as capital needs theory, have not been used in the development of RD-related research hypotheses, despite the evident relationship between RD and the need to raise capital. This suggests that it will be appropriate for future researchers to consider new theories that have been rarely applied, such as capital needs theory, in future research so as to offer new insights and theoretical advancements.

Sixth, RD literature suffers from a major limitation. The literature on developing RD measurement is rare and future researchers are encouraged to investigate linguistics or computer science to help improve and facilitate the process of RD quality measurement. No study is found to examine the RD characteristics with reference to the qualitative characteristics of useful accounting information as presented by the accounting conceptual framework. Therefore, most of the studies are found to examine RD practices based on the level of disclosure rather than on the quality. It would be interesting to extend RD literature and provide a reliable and valid measure of RD quality. Further research could also extend the governance-RD literature by examining the impact of CEO attributes such as horizon, tenure, experience, compensation, age, risk-orientation, gender, and other personal attributes on RD. At the time of writing no study has examined such attributes as determinants of RD quality.

Last, the literature on disclosure of internal controls effectiveness is rare despite its importance. This research avenue could be extended by researching how effective internal controls could affect the quality of financial reporting in general and risk information in particular. In addition, more empirical investigation is needed to explore different types of risk that are under-researched as far as we are aware. These include – but are not limited to – Brexit-related risk disclosure, COVID-19--related risk disclosure, and cyber risk. Further work could also examine RD

practice following the UK's decision to leave the European Union or RD practice in times of the COVID-19 pandemic.

7. Summary, Limitations and Conclusion

This study comprehensively reviews RD research to date. Unlike past review studies, this review covers several conceivable aspects and sources of RD research, including theoretical and empirical studies relating to financial and non-financial institutions. The study examines eight aspects of 104 studies published in 51 academic journals during the 1999–2019 period. The studies are classified into six different themes based on their research objectives: (i) RD practice and characteristics; (ii) determinants of RD; (iii) economic consequences of RD; (iv) compliance with RD regulations; (v) proposing or developing a new measure of RD; and (vi) disclosure on weaknesses of internal control and risk management systems.

The main objectives are to explore the different aspects of the current RD research, determine the research gaps, and help develop the future RD research agenda by identifying opportunities for future research. By applying five screening criteria, we have been able to collect 104 studies. All the studies are published in journals ranked in AJG2018. Moreover, 50% of the 104 studies are published in top-ranked journals (3*-and 4*-rated journals). Thirty-one per cent of the studies explore samples of financial institutions and banks. Seven studies explore the disclosure on weaknesses of internal controls and risk management systems. Twenty-one per cent explore samples in 15 developing countries, compared with 79% in 34 developed countries. The USA, the UK, and Italy dominate 35% of the RD research around the world. Furthermore 24 theories are employed by the review studies investigated. While the agency and signaling theories dominate with 44%, the capital needs theory is neglected, despite its relevance to disclosure. Regarding the historical development of RD research, 50% of the studies have been undertaken between 2012 and 2019.

The results of these reviews provide several research opportunities for future research. *First*, more research is needed to explore perceptions of an RD standard and the impact of regulations on RD. *Second*, more research is needed to examine the level, determinants and economic consequences of RD in financial institutions and to compare the findings with non-financial institutions. *Third*, future research could investigate the RD economic feasibility in variant financial communication channels (e.g., its impact on credit ratings, cash holdings and investment efficiency). *Fourth*, there is a need to explore RD in developing countries, specifically those countries with a weak governance system. *Fifth*, researchers need to consider other relevant disclosure theories (e.g., capital needs theory) in the development of risk-related research hypotheses. *Sixth*, future research needs to assess the quality of RD and how it is influenced by

CEO attributes. *Last*, more research is needed to measure and explore weaknesses in internal control risks as well as cyber-related risk, Brexit-related risk and COVID-19-related risks.

Our review has some limitations as follows. *First*, the review period is limited to the 1999–2019 period, so any articles published before or after this period have not been reviewed. *Second*, some RD articles were excluded from the review sample due to screening criteria. For example, RD articles published on SSRN or presented in conferences are not covered in the review. *Third*, only articles published in ABS- ranked journals are reviewed. All articles are given the same weight despite the wide variation in the journals' quality. We received a suggestion from a reviewer to exclude articles published within low-ranked journals, but we preferred to retain them in the interest of comprehensiveness. *Fourth*, a review of the measurement techniques of disclosure quality and quantity could have been a contribution; however, this was not presented by our study. *Last*, a review of the RD regulations could have been another contribution, but it was not covered.

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Figures

Fig. (1) Approach and Structure of the Study

> **Identify the Need for the Review**

> Develop a Review Protocol
> 1- Construct a search keywords list
> 2- Identify the target search engines and databases
> 3- Set selection criteria to screen the most relevant articles
> 4- Start a comprehensive search and download the selected articles in a full text
> 5- Apply the selection criteria and agree on a final list of articles to be reviewed
> 6- Start extracting aspects and insights and drawing conclusions

> **The Review Process**
> (**Eight Aspects of the Review Articles**)

> 1- Classification of RD Articles

> 2- Historical Development of RD Research

> 3- RD Research Impact

> Journal Quality | Citations

> 4- Frequency distribution of RD articles by measurement unit

> 5- Frequency distribution of theories applied

> 6- Frequency distribution of RD articles by country

> 7- Frequency Distribution of RD articles by RD Category

> 8- Reviewing the results reported by the review articles

> RD in Non-Financial Institutions
> 1. RD Practice & Characteristics
> 2. Determinants of RD
> 3. Economic Consequences of RD
> 4. Compliance with RD Regulations
> 5. A Proposed Model/Index
> 6. Disclosure on Weaknesses of Internal Control Systems

> RD in Financial Institutions
> 1. RD Practice & Characteristics
> 2. Determinants of RD
> 3. Economic Consequences of RD
> 4. Compliance with RD Regulations

> The Study Implications

> The Literature Gaps & Opportunities for Future Research

> A Summary

Figure. (2): RD Articles Classification

RD Research - Non-Financial & Financial Institutions
- RD Practices & Characteristics: 14%
- RD Determinants: 40%
- RD Economics Consequences: 29%
- RD Regulations' Compliance: 7%
- A Proposaed Index or Model: 3%
- Disclosure on Weaknesses of Internal Control Systems: 7%

RD Research - Non-Financial Institutions
- RD Practices & Characteristics: 11%
- RD Determinants: 43%
- RD Economics Consequences: 25%
- RD Regulations' Compliance: 7%
- A Proposaed Index or Model: 4%
- Disclosure on Weaknesses of Internal Control Systems: 10%

RD Research - Financial Institutions
- RD Practices & Characteristics: 22%
- RD Determinants: 34%
- RD Economic Consequences: 38%
- RD Regulations' Compliance: 6%

Figure (3): Trend of RD Research during 1999- 2019.

Historical Development of RD Research During 1999- July 2019

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total	3	1	2	3	1	4	5	7	8	5	7	2	5	4	7	5	11	8	5	7	11
Non-Financial Institutions	3	1	1	2	1	1	3	2	8	4	6	1	3	3	5	4	9	6	4	2	3
Financial Institutions	0	0	1	1	0	3	2	5	0	1	1	1	2	1	2	1	2	2	3	4	0

Figure (4): Trend of RD Research Themes during 1999- 2019.

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Figure (5): Frequency Distribution of Articles by Measurement Unit

Figure (6): The Frequency of Theories in the Review Articles

Tables

Table 1: The Review Studies of RD Literature

	Ryan (1997)	Ryan (2012)	Khlif & Hussainey (2016)	Elshandidy et al. (2018a)	Tahat et al. (2019)	Current Study
Review Sample	n/a	n/a	42	32	19	104
Journal Rank	n/a	n/a	n/a	3 and 4 *	3 and 4*	1: 4*
Review Period	1970-1990	n/a	2004-2014	1997-2016	1998-2018	1999- July 2019
Sectors Examined	Financial Institutions	Financial Institutions	Non-financial	Non-financial & Financial	Financial Instruments	Non-financial & Financial
Risk types	Systematic Equity Risk	Financial Instruments Risks	All	All	Financial Instruments Associated Risks	All
Review Themes	Determinants of RD	Informativeness of RD	Determinants of RD	Incentives and Informativeness	Financial instruments-related risk information Value-relevance of financial instruments disclosure	1- RD Practices & Characteristics 2- Determinants 3- Consequences 4- Compliance 5- Disclosure on weaknesses of internal control systems

Table 2: The Studies Classification into six themes

No	Theme	Non-Financial	Financial	Total	%
1	RD Practices and Characteristics	(8 non-financial studies) 11% 1. Solomon (1999) 2. Carlon et al. (2003) 3. Lajili and Zegal (2005) 4. Linsley and Lawrence (2007) 5. Dia and Zeghal (2008) 6. Greco (2012) 7. Abdelrehim et al. (2017) 8. Kang and Gray (2019)	(7 financial studies) 22% 1. Hodder and McAnally (2001) 2. Linsley and Shrives (2005b) 3. Yong et al. (2005) 4. Frolov (2006) 5. Perignon and Smith (2010) 6. Oliveria et al. (2011c) 7. Maffei et al. (2014)	15	14%
2	Determinants of RD	(31 non-financial studies) 43% 1. Solomon et al. (2000) 2. Linsley and Shrives (2005a) 3. Linsley and Shrives (2006) 4. Konishi and Ali (2007) 5. Lopes and Rodrigues (2007) 6. Abraham and Cox (2007) 7. Marshall and Weetman (2007) 8. Iatridis (2008) 9. Dobler (2008) 10. Hassan (2009) 11. Rajab and Handley-Schachler (2009) 12. Amran et al. (2009) 13. Taylor et al. (2010) 14. Oliveria et al. (2011a) 15. Dobler et al. (2011) 16. Elzahar and Hussainey (2012) 17. Miihkinen (2012) 18. Ntim et al. (2013) 19. Elshandidy et al. (2013) 20. Mokhtar and Mellett (2013) 21. Dominguez and Gamez (2014) 22. Elshandidy et al. (2015) 23. Elshandidy and Neri (2015) 24. Abdallah et al. (2015) 25. Martikaninen et al. (2015) 26. Allini et al. (2016) 27. Marzouk (2016) 28. Moumen et al. (2016) 29. Khlif and Hussainey (2016) 30. Fukukawa and Kim (2017) 31. Ibrahim et al. (2019)	(11 financial studies) 34% 1. Helbok and Wagner (2006) 2. Linsley et al. (2006) 3. Oliveria et al. (2011b) 4. Savvides and Savvidou (2012) 5. Barakat and Hussainey (2013) 6. Al-Hadi et al. (2016) 7. Al-Maghzom et al. (2016) 8. Al-Hadi et al. (2017b) 9. Neifar and Jarboui (2018) 10. Abbassi and Schmidt (2018) 11. Elshandidy et al. (2018b)	42	40%
3	Economic Consequences of RD	(18 non-financial studies) 25% 1. Rajgopal (1999) 2. Hodder et al. (2001) 3. Linsmeier et al. (2002) 4. Petersen and Plenborg (2006) 5. Lui et al. (2007) 6. Kothari et al. (2009) 7. Kravet and Muslu (2013) 8. Miihkinen (2013) 9. Campbell et al. (2014) 10. Abdullah et al. (2015) 11. Filzen (2015) 12. Moumen et al. (2015)	(12 financial studies) 38% 1. Jorion (2002) 2. Woods and Marginson (2004) 3. Liu et al. (2004) 4. Ahmed et al. (2004) 5. Nier and Baumann (2006) 6. Chipalkatti and Datar (2006) 7. Akhigbe and Martin (2008) 8. Elbannan and Elbannan (2015) 9. Al-Hadi et al. (2015)	30	29%

		13.Elshandidy and Shrives (2016) 14.Hope et al. (2016) 15.Heinle and Smith (2017) 16.Tan et al. (2017) 17.Kim and Yasuda (2018) 18. Li et al. (2018)	10.Adelopo (2017) 11.Al-Hadi et al. (2017a) 12.Malafronte et al. (2018)		
4	RD Regulations' Compliance	<u>(5 non-financial studies) 7%</u> 1. Roulstone (1999) 2. Blankley et al. (2002) 3. Othman and Ameer (2009) 4. Buckby et al. (2015) 5. Tauringana and Chithambo (2016)	<u>(2 financial studies) 6%</u> 1.Bischof (2009) 2.Asongu (2013)	7	7%
5	A Proposed Index or Model	<u>(3 non-financial studies) 4%</u> 1. Beretta and Bozzolan (2004) 2. Abraham and Shrives (2014) 3. Ibrahim and Hussainey (2019)	<u>None</u>	3	3%
6	Disclosure on Weaknesses of Internal Controls and Risk Management Systems	<u>(7 non-financial studies) 10%</u> 1. Ge and McVay (2005) 2. Ogneva et al. (2007) 3. Doyle et al. (2007) 4. Deumes and Knechel (2008) 5. Hill and Short (2009) 6. El-Gazzar et al. (2011) 7. Sun (2015)	<u>None</u>	7	7%
	Total No.	72 studies	32 studies	104	100%
	Total %	69%	31%	100%	

Table 3: Research Impact by Journal Rankings

No.	Journal	No. of Articles	Total %	AJG 2018
1	The Accounting Review	5	5	4*
2	Journal of Accounting Research	1	1	4*
3	Journal of Accounting and Economics	1	1	4*
4	Review of Accounting Studies	5	5	4
5	Journal of Financial Intermediation	2	2	4
6	The British Accounting Review	8	8	3
7	Accounting Horizons	4	4	3
8	Corporate Governance: An International Review	2	2	3
9	International Journal of Accounting	6	6	3
10	Auditing: A Journal of Practice & Theory	1	1	3
11	Accounting, Auditing, & Accountability Journal	1	1	3
12	Journal of International Accounting, Auditing, & Taxation	2	2	3
13	European Accounting Review	1	1	3
14	Journal of Banking & Finance	2	2	3
15	International Review of Financial Analysis	5	5	3
16	Journal of Accounting, Auditing, & Finance	2	2	3
17	Accounting & Business Research	1	1	3
18	Journal of Business Finance and Accounting	1	1	3
19	Financial Analysts Journal	1	1	3
20	International Review of Economics and Finance	1	1	2
21	Quarterly Review of Economics and Finance	1	1	2
22	Managerial Auditing Journal	6	6	2
23	Journal of Risk Research	1	1	2
24	Journal of Risk	1	1	2
25	Canadian Journal of Administrative Sciences	2	2	2
26	International Journal of Accounting, Auditing & Performance	2	2	2
27	Public Money & Management	1	1	2
28	Journal of Accounting in Emerging Economies	1	1	2
29	Advances in Accounting, Incorporating, Advances in International	2	2	2
30	Journal of Applied Accounting Research	4	4	2
31	Journal of International Accounting Research	1	1	2
32	Research in International Business & Finance	3	3	2
33	Asian Review of Accounting	1	1	2
34	Journal of Banking Regulation	3	3	2
35	Accounting in Europe	1	1	2
36	Journal of Multinational Financial Management	2	2	2
37	Australian Accounting Review	1	1	2
38	Accounting & Finance	2	2	2
39	Journal of International Financial Management and Accounting	1	1	2
40	Review of Accounting and Finance	1	1	2
41	The Journal of Risk Finance	2	2	1
42	Corporate Communications: An International Journal	1	1	1
43	Spanish Accounting Review	1	1	1
44	Journal of Financial Regulation & Compliance	4	4	1
45	Qualitative Research in Financial Markets	1	1	1
46	Corporate Ownership & Control Journal	1	1	1
47	International Advances in Economic Research	1	1	1
48	Qualitative Research in Financial Markets	1	1	1
49	World Review of Entrepreneurship, Management and Sustainable	1	1	1
50	Australasian Accounting, Business and Finance Journal	1	1	1
51	International Journal of Organizational Analysis	1	1	1
51	Total	104	100%	

"4" & "4" top journals, "3" a highly regarded journal, and "2" a well-regarded journal (Hoque, 2014)

Table 4: Research Impact by Citations per Year (CPY) and AJG2018

No.	Article	No. of Citations*	Citation Years (2019-publication year)	CPY**	AJG2018
	Panel (A): Non-Financial Institutions Studies				
1	Doyle et al. (2007)	1386	12	115.5	4*
2	Kothari et al. (2009)	685	10	68.50	4*
3	Ge and McVay (2005)	858	14	61.29	3
4	Campbell et al. (2014)	282	5	56.40	4
5	Linsley and Shrives (2006)	583	13	44.85	3
6	Ogneva et al. (2007)	516	12	43.00	4*
7	Beretta and Bozzolan (2004)	583	15	38.87	3
8	Abraham and Cox (2007)	461	12	38.42	3
9	Kravet and Muslu (2013)	185	6	30.83	4
10	Lopes and Rodrigues (2007)	344	12	28.67	3
11	Elzahar and Hussainey (2012)	184	7	26.29	2
12	Ntim et al. (2013)	157	6	26.17	3
13	Abraham and Shrives (2014)	119	5	23.80	3
14	Lajili and Zegal (2005)	316	14	22.57	2
15	Elshandidy and Neri (2015)	90	4	22.50	3
16	Hope et al. (2016)	65	3	21.67	4
17	Deumes and Knechel (2008)	225	11	20.45	3
18	Dobler et al. (2011)	159	8	19.88	2
19	Elshandidy et al. (2013)	119	6	19.83	3
20	Dobler (2008)	203	11	18.45	3
21	Oliveira et al. (2011a)	145	8	18.13	2
22	Miihkinen (2012)	110	7	15.71	3
23	Elshandidy et al. (2015)	62	4	15.50	3
24	Solomon et al. (2000)	292	19	15.34	3
25	Hassan (2009)	152	10	15.20	2
26	Iatridis (2008)	162	11	14.73	3
27	Linsmeier et al. (2002)	245	17	14.41	4
28	Mokhtar and Mellett (2013)	82	6	13.67	2
29	Allini et al. (2016)	40	3	13.33	2
30	Linsley and Lawrence (2007)	158	12	13.17	3
31	Rajgopal (1999)	236	20	11.80	4*
32	Petersen and Plenborg (2006)	145	13	11.15	3
33	Heinle and Smith (2017)	22	2	11.00	4
34	Linsley and Shrives (2005a)	145	14	10.36	2
35	Miihkinen (2013)	61	6	10.17	2
36	Rajab and Handley-Schachler	92	10	9.20	1
37	Taylor et al. (2010)	82	9	9.11	2
38	Sun (2015)	27	3	9.00	2
39	Hodder et al. (2001)	154	18	8.56	3
40	Abdallah et al. (2015)	34	4	8.50	2
41	Roulstone (1999)	161	20	8.05	3
42	Moumen et al. (2015)	31	4	7.75	2
43	Dominguez and Gamez (2014)	37	5	7.40	1
44	Lui et al. (2007)	87	12	7.25	4*
45	Khlif and Hussainey (2016)	35	5	7.00	2
46	Buckby et al. (2015)	28	4	7.00	2
47	Marshall and Weetman (2007)	77	12	6.42	3
48	Abdullah et al. (2015)	24	4	6.00	2
49	Filzen (2015)	23	4	5.75	3
50	Greco (2012)	37	7	5.29	1
51	Tauringana and Chithambo (2016)	15	3	5.00	2

No.	Article	No. of Citations*	Citation Years (2019-publication year)	CPY**	AJG2018
52	Othman and Ameer (2009)	47	10	4.70	1
53	Elshandidy and Shrives (2016)	14	3	4.67	3
54	Konishi and Ali (2007)	50	12	4.17	3
55	Hill and Short (2009)	37	10	3.70	2
56	Marzouk (2016)	11	3	3.67	2
57	Abdelrehim et al. (2017)	7	2	3.50	3
58	Martikaninen et al. (2015)	12	4	3.00	2
59	Fukukawa and Kim (2017)	6	2	3.00	3
60	Kim and Yasuda (2018)	3	1	3.00	2
61	Dia and Zeghal (2008)	26	11	2.36	2
62	Carlon et al. (2003)	36	16	2.25	2
63	Moumen et al. (2016)	6	3	2.00	2
64	Tan et al. (2017)	3	2	1.50	3
65	El-Gazzar et al. (2011)	10	8	1.25	1
66	Blankley et al. (2002)	18	17	1.06	2
67	Solomon (1999)	15	20	0.75	3
68	Amran et al. (2009)	7	10	0.70	2
69	Kang and Gray (2019)	0	1	0.00	3
70	Li et al. (2018)	0	1	0.00	2
71	Ibrahim et al. (2019)	0	1	0.00	2
72	Ibrahim and Hussainey (2019)	0	1	0.00	3
72	Sub-total	10829	600	1114.17	
	Panel (B): Financial Institutions Studies				
No.	Article	No. of Citations*	Citation Years (2019-publication year)	CPY**	AJG2018
1	Nier and Baumann (2006)	670	13	51.54	4
2	Perignon and Smith (2010)	340	9	37.78	3
3	Jorion (2002)	339	17	19.94	4
4	Barakat and Hussainey (2013)	104	6	17.33	3
5	Al-Hadi et al. (2016)	44	3	14.67	3
6	Bischof (2009)	111	10	11.10	2
7	Linsley et al. (2006)	142	13	10.92	2
8	Linsley and Shrives (2005b)	143	14	10.21	1
9	Oliveria et al. (2011b)	80	8	10.00	1
10	Neifar and Jarboui (2018)	10	1	10.00	2
11	Akhigbe and Martin (2008)	98	11	8.91	3
12	Helbok and Wagner (2006)	107	13	8.23	2
13	Oliveria et al. (2011c)	60	8	7.50	2
14	Liu et al. (2004)	87	15	5.80	4
15	Al-Maghzom et al. (2016)	17	3	5.67	1
16	Ahmed et al. (2004)	74	15	4.93	3
17	Woods and Marginson (2004)	69	15	4.60	3
18	Maffei et al. (2014)	22	5	4.40	2
19	Al-Hadi et al. (2015)	16	4	4.00	2
20	Elbannan and Elbannan (2015)	16	4	4.00	3
21	Al-Hadi et al. (2017a)	6	2	3.00	2
22	Asongu (2013)	17	6	2.83	1
23	Savvides and Savvidou (2012)	18	7	2.57	1
24	Hodder and McAnally (2001)	39	18	2.17	3
25	Abbassi and Schmidt (2018)	2	1	2.00	4
26	Adelopo (2017)	3	2	1.50	1
27	Frolov (2006)	17	13	1.31	2
28	Chipalkatti and Datar (2006)	16	13	1.23	2
29	Yong et al. (2005)	14	14	1.00	2
30	Malafronte et al. (2018)	0	1	0.00	2
31	Al-Hadi et al. (2017b)	0	2	0.00	2

32	Elshandidy et al. (2018b)	0	1	0.00	2
32	Sub-total	2681	267	269.14	
104	Total	13510	867	1383.31	

*Number of Citations as published by Google Scholar as of 5 August 2019.
**CPY = Citations / (2019-Publication Year).

Table 5: Developed and Developing Country Representation*

No.	Country	Non-Financial Companies Articles			Financial Firms Articles			Total	%
		Individual	Cross-Country	Sub-total	Individual	Cross-Country	Sub-total		
Panel (A): Developed Countries									
1	USA	17	3	20	6	2	8	28	17
2	UK	15	4	19	2	1	3	22	13
3	Italy	3	1	4	1	4	5	9	5
4	Portugal	2	--	2	2	3	5	7	4
5	Australia	3	--	3	--	3	3	6	4
6	Netherlands	1	--	1	--	5	5	6	4
7	France	--	--	--	--	5	5	5	3
8	Canada	2	1	3	--	1	1	4	2
9	Germany	1	2	3	1	--	1	4	2
10	Japan	3	--	3	1	--	1	4	2
11	Finland	3	--	3	--	--	--	3	2
12	Belgium	--	--	--	--	3	3	3	2
13	Spain	1	--	1	--	1	1	2	1
14	Sweden	--	--	--	--	2	2	2	1
15	Switzerland	--	--	--	--	2	2	2	1
16	Greece	--	--	--	--	2	2	2	1
17	Denmark	1	--	1	--	1	1	2	1
18	Cyprus**	--	--	--	--	2	2	2	1
19	Taiwan**	--	--	--	--	2	2	2	1
20	South Korea**	--	--	--	--	2	2	2	1
21	Norway	--	--	--	--	2	2	2	1
22	Malta**	--	--	--	--	2	2	2	1
23	Singapore**	--	--	--	--	1	1	1	1
24	Austria	--	--	--	--	1	1	1	1
25	Ireland	--	--	--	--	1	1	1	1
26	Hong Kong**	--	--	--	--	1	1	1	1
27	Lithuania**	--	--	--	--	1	1	1	1
28	New Zealand	--	--	--	--	1	1	1	1
29	Israel**	--	--	--	--	1	1	1	1
30	Czech Rep.**	--	--	--	--	1	1	1	1
31	Iceland	--	--	--	--	1	1	1	1
32	Latvia**	--	--	--	--	1	1	1	1
33	Slovakia**	--	--	--	--	1	1	1	1
34	Slovenia**	--	--	--	--	1	1	1	1
34	Sub-total	52	11	63	13	57	70	133	79%
Panel (B): Developing Countries									
No.	Country	Non-Financial Companies			Financial Firms Articles			Total	%
		Individual	Cross-Country	Total	Individual	Cross-Country	Total		
1	Saudi Arabia	1	--	1	1	3	4	5	3
2	Malaysia	3	--	3	--	1	1	4	2
3	Kuwait	--	--	--	--	3	3	3	2
4	UAE	--	--	--	--	3	3	3	2
5	Egypt	2	--	2	1	--	1	3	2
6	Oman	--	--	--	--	3	3	3	2

7	Bahrain	--	--	--	--	3	3	3	2
8	Qatar	--	--	--	--	3	3	3	2
9	Malawi	1	--	1	1	--	1	2	1
10	South Africa	1	--	1	--	--	--	1	1
11	Philippines	--	--	--	--	1	1	1	1
12	Argentina	--	--	--	--	1	1	1	1
13	Brazil	--	--	--	--	1	1	1	1
14	Chile	--	--	--	--	1	1	1	1
15	Bulgaria	--	--	--	--	1	1	1	1
15	Sub-total	8	--	8	3	24	27	35	21%
49	Total	60	11	71	16	81	97	168	100%

*The country classification is based on the *World Economic Outlook Report* issued in 2019. It is noteworthy that these figures refer to the number of times that each country is examined, not necessarily, the number of articles; the review articles include 23 cross-country articles that examine several countries. The study of Nier and Baumann (2006) only examines 32 countries together. There are three cross-country articles that examine large sets of international banks and do not mention the names of the examined countries: Perignon and Smith (2010), Helbok and Wagner (2006), and Asongu (2013), they are not classified in the table. Finally, the countries are classified in the table descending according to the figures in the "Total" Column.

**The IMF graduated some countries from developing to advanced countries recently, Singapore, Taiwan, South Korea, Hong Kong, and Israel were graduated in 1997, Cyprus in 2001, Slovenia in 2007, Malta in 2008, Czech Rep. and Slovakia in 2009, Latvia in 2014, and Lithuania in 2015.

Table 6: Frequency Distribution of RD articles by RD Type

RD Type	Non-Financial Institutions Articles				Financial Institutions Articles				Total
	Voluntary	Mandatory	Both	Total	Voluntary	Mandatory	Both	Total	
1-RD in General	10	8	39	57	4	3	4	11	68
2- Disclosure of Market Risks									
-FRR No. 48 -USA		5		5		5		5	10
-Foreign Exchange	1		1	2					2
-Interest Rate							1	1	1
-Credit Risk							1	1	1
-Liquidity - Pillar 3					1			1	1
-Derivatives					1			1	1
-Mix of Market RD					1			1	1
Sub-total	1	5	1	7	8		2	10	17
3- Disclosure of Financial Instruments' Risks									
- (IFRS 7)		1		1	1			1	2
- (FRS 13) – UK		1		1					1
-(FRS 132) – Malaysia		1		1					1
- (IAS 32 and 39)		1		1					1
Sub-total		4		4	1			1	5
4- Disclosure on weaknesses of internal controls and internal risk management systems	2	5 (SOX)		7					7
5- RD imposed by the 2005 SEC Updates - USA		2		2					2
6-Business and Operational RD			1	1	2			2	3
7- RD as required by IAS 1, ISA 30, IAS 32, IFRS 7, and Pillar 3 of the Basel 2 Accord							1	1	1
8- Financial Analysts' Risk Ratings	1			1					1
Total	14	24	41	79	6	12	7	25	104