Pension Accounting and Disclosure Reforms: Determinants and Consequences

By

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Dedication

This thesis is dedicated with deep gratitude and utmost respect to the cherished memory of my beloved father, who gracefully departed from this world.

Declaration of Authorship

I, Alaaeldin Ahmed,

declare that this thesis and the work presented in it are my own and have been generated by me as the result of my own original research. The title of the thesis is 'Pension Accounting and Disclosure Reforms: Determinants and Consequences.' I confirm that none of this work has been published before submission. However, two chapters have been presented at several conferences, which are detailed below:

Chapter 2 (Paper 1)

- BAFA Annual Conference - Doctoral Masterclasses (April 2021) – Online
- Essex Business School, University of Essex, (November 2020), Essex, UK

Chapter 3 (Paper 2)

- BAFA 25th Annual Conference – Doctoral Masterclasses – Financial Reporting and Business Communication (FRBC) (July 2022) –University of Cagliari – Italy
- BAFA Annual Conference – Main conference (April 2023) - University of Sheffield
- Essex Business School, University of Essex, (May 2021), Essex, UK

Chapter 4 (Paper 3)

- Essex Business School, University of Essex, (May 2022), Essex, UK

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ABSTRACT

Accounting standard-setting bodies and regulators have imposed requirements to improve pension accounting regulations and disclosure practices due to the importance and materiality of defined benefit pension plans. In particular, IAS 19R was recently amended to address the excessive risk-taking in pension plan investments. In addition, academics, and practitioners have stressed the importance of high-quality and transparent disclosure to improve the usefulness of information aimed at stakeholders. Drawing on theories such as agency theory, positive accounting theory, stakeholder salience theory, collective bargaining theory, signalling theory, and behavioural decision theory, the study addresses three key research questions along two axes: the implications of accounting regulations on pension investment decisions followed respectively by the determinants and consequences of pension disclosure practices. Therefore, this study first examines the economic consequences of IAS 19R on pension asset allocations and the moderating role of firm financial distress by relying on a sample of European listed firms affected by IAS 19R, compared to a control group of US firms that share similar firms' characteristics but are unaffected by the standard between 2009 and 2014. Second, by relying on an automated content analysis approach to evaluate the specificity of defined benefit pension plan information for 119 FTSE350 listed firms over the period 2017 to 2019, the study examines whether a firm's unionisation level has an impact on the quality (specificity) of pension information in the strategic report and whether this relationship is moderated by the level of cash holdings. Thirdly, the study considers whether the pension information specificity affects credit rating agencies' (CRAs) decisions. It also examines whether and how pension information specificity influences credit rating disagreement between CRAs.

Respectively, the analysis reveals firms shifted out of equities during the post-IAS 19R period, especially if they were in financial distress. Some firms allocated pension plans to other asset classes, but the types of asset classes being re-allocated varied across countries, suggesting that the economic consequences of IAS 19R on pension asset allocations are influenced by firms' financial health and the country's pension welfare system. Subsequently, the study found that while the strategic report became lengthier, there was a decline in the quality (specificity) of pension information. However, a higher unionisation rate improved the quality of pension disclosure, suggesting that trade unions are seen as salient stakeholders who can influence firms' disclosure strategies; especially if firms hold high cash levels that enhance employees-employers trust. Finally, there is a significantly negative association between the level of pension information specificity in the firm's strategic report and credit rating decisions, suggesting that higher pension information specificity is associated with a lower credit rating or downgrading. There is also evidence that greater pension information specificity reduces rating disagreement, particularly when the ratings are two notches or higher.

Overall, standard-setting bodies and practitioners should consider the role of the dimension of social welfare characteristics in the allocation of pension plans to different asset classes, which may result in shifting rather than mitigating pension risk within the pension plan. Furthermore, regulators should pay attention to firms' disclosure strategies when they face salient stakeholders to accommodate their demands which may cause inconsistency in reporting behaviour resulting in a lack of information transparency to all stakeholders.

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List of Abbreviations

Abbreviation	Definition
2SLS	Two-Stages Least Squares
BHS	British Home Stores
CRAs	Credit Rating Agencies
DB	Defined Benefit
DID	Difference-in-differences
EC	European Countries
ERR	Expected Rate of Return
FRC	Financial Reporting Council
FRS	Financial Reporting Standards
FTSE	Financial Times Stock Exchange
IAS	International Accounting Standard
IFRS	International Financial Reporting Standards
LSE	London Stock Exchange
MD&A	Management and Discussion Analysis.
OLS	Ordinary Least Squares
PIS	Pension Information Specificity
PSM	Propensity Score Matching
SRS	Strategic Report Specificity
SFAS	Statements of Financial Accounting Standards
UK	United Kingdom
US	United States of America

Chapter 1: Introduction

1.1 Introduction

Corporations may encounter challenges when accounting standards change, which can result in unintended consequences that are difficult to determine (Zeff, 1978). These consequences can alter a firm's operations and decisions, making it challenging to assess their impact. Furthermore, changes in operations and decisions can have implications for the reporting environment and disclosure strategies. Although there is pressure on firms to overcome agency problems between principals and agents through improving disclosures to reduce information asymmetry and enhance transparency, they may face additional pressure from other stakeholders who also benefit from transparent disclosure (DesJardine et al., 2021). It is the responsibility of firms to balance the rewards and consequences that may arise from changes in the information environment and transparency. For instance, while high-quality and transparent disclosure can alleviate uncertainty about a firm's performance for lenders and credit analysts, it can also harm the firm, for example, by leading to credit downgrading.

From the lens of pension accounting, pension plans are complex yet important elements to manage. This is because, from a capital market perspective, they may have spill over effects (Kaufmann et al., 2022; Kim, 2008), leading to the mispricing of firms' stocks, and changes in accounting standards may impact future cash flows and earnings (Glaum & Giessen, 2009). Thus, pension accounting may have ripple effects on the capital market and the broader economy. Moreover, from a social perspective, inadequate pension information can lead to larger societal issues when firms lack transparency and mismanage their pension plans. For instance, in the cases of BHS and Debenhams in the UK, the employee pension plans were significantly underfunded at the expense of employees and society at large. Underfunding of

pension plans can result in a reduction in retirement income and increased reliance on state support, which can affect public finances. Corporate accountability towards their employees' pension plans and their investment strategies is important to avoid exposing pension plans to excessive risk (Gold, 2005). This highlights the importance of managing pension plans properly to avoid any detrimental impact on the capital market and society at large.

Mandatory amendments to pension accounting standards aim to prevent management from taking excessive risks in their pension plan to achieve higher pension returns at the expense of their employees and society. One such amendment proposed by IAS 19R eliminates the ERR assumption, a device used for earnings management, and replaces it with a discount rate. This change discourages managers from taking excessive risks in pension investments to rationalize higher ERR. Therefore, it can be argued that IAS 19R has a real impact on pension investment strategies, as management choices may be influenced by changes in accounting rules rather than management rules. Demographic and social factors also affect pension accounting, so it is important to consider these factors when adopting accounting changes. It is worth considering whether mandatory changes in accounting standards should be uniformly applied or whether contextual factors should be considered in their adoption.

Firms may face salient stakeholders, such as trade unions, who are key stakeholders and users of pension information, to advocate for their members' benefits and demand more transparent and accurate pension disclosures. Trade unions can work towards improving pension plan disclosures and promoting greater transparency and accountability. By raising awareness about the importance of pension information and advocating for policies that benefit employees, unions can help ensure that pension plans are well-managed and that employees receive the retirement benefits they are entitled to. The influence of unionisation may be particularly strong during periods of uncertainty or economic downturns, such as the recent

yield crisis which has highlighted the potential risks associated with pension investments. With bond yields remaining low, pension funds may struggle to generate sufficient returns to meet their obligations, resulting in reduced retirement income for employees. This crisis may lead to increased scrutiny of pension information and investment decisions, suggesting that stronger unionisation may lead to better disclosure quality and higher transparency regarding pension plans.

Given the importance of pension data for credit ratings, its quality is a critical factor for analysts. Therefore, clear disclosure is vital to assess creditworthiness. Altering the quality and quantity of pension disclosure may give rise to higher uncertainty which could adversely affect credit ratings, particularly when firms seek multiple ratings. In particular, it may lead to subjectivity and bias due to a lack of transparency and higher vagueness. This may result in disagreements between rating agencies.

1.2 Research Motivation

This thesis consists of three papers with a central focus on pension accounting and disclosure. The motivation for these three papers is as follows:

Firstly, Paper 1 discusses defined benefit plans and their importance for corporations as a risk-taking mechanism. While defined benefit pension plans are crucial employee benefits for both firms and employees, they hold substantial value on a firm's financial statements, potentially impacting strategic decisions. Managers may manage plan assets to serve their interests by using the flexibility in pension accounting standards and regulations to manipulate reported income, along with taking higher risks in pension plans. The recent IAS 19R amendment challenges managers to navigate earnings manipulation while facing higher pension risk. Rational managers may reduce high-risk investments post-IAS 19R, influencing

firms' investment decisions. While current studies find evidence for the impact of changes in accounting regulations on earnings management and de-risking of pension risk, these findings have yet to be generalised in different contexts due to institutional differences and the complexity of pension systems between countries. Additionally, there is a lack of research on the composition of pension plan assets and how firms may use different types of assets, especially the opaque asset classes, to mislead users of financial statements about their strategies in managing pension risk, and how firms respond to accounting changes in the context of financial distress and institutional constraints affecting their pension investment decisions.

Secondly, Paper 2 discusses how the intricate interplay between trade unions and managerial strategies constitutes a dynamic and consequential facet of industrial relations. It can be argued that the relationship between trade unions and managements depends on the alignment between them. If the interests are aligned, trade unions may collaborate with management, harmonising efforts for a smooth corporate operation. Conversely, misalignment with management prompts employees and their representatives to employ diverse tactics, such as collective bargaining, lobbying, and industrial action, in asserting their demands and amplifying their voices. This may be seen by management as a rent seeking behaviour aimed at extracting unjustifiable benefits from firms. Consequently, managers, cognisant of the influence of financial disclosure narratives on the perception of firms' financial performance by trade unions, may exhibit reticence in divulging information to preserve their informational advantage in negotiations or other dealings with the trade unions. While financial disclosure literature primarily focuses on the influence of disclosure on equity market stakeholders, the importance of financial disclosure on non-equity market stakeholders is limited and inconclusive. This leaves a conspicuous gap in our understanding of the impact of disclosure

quality and quantity on stakeholders beyond the equity market, including those with a vested interest in non-financial employee-related information (Aobdia et al., 2022; Blankespoor et al., 2020). This study provides an opportunity to discern how higher unionisation may prompt firms to recalibrate their disclosure strategies to accommodate the presence of salient stakeholders, such as their employees represented by their trade unions.

Paper 3 focuses on credit ratings and the role of both financial and non-financial information. Previous studies have primarily focused on quantitative data (Akins, 2017; Bierey & Schmidt, 2017; Kim et al., 2013; Livingston et al., 2007; Spiceland et al., 2016). However, there is an emerging recognition of the valuable insights from qualitative information, particularly from corporate narrative disclosures (Bonsall & Miller, 2017; Dyer et al., 2017; Hope et al., 2016; Li, 2008; McMullin, 2016). Past research extensively examined quantitative information for assessing defined-benefit pension schemes' creditworthiness (Anantharaman & Henderson, 2016; Campbell et al., 2012; Cardinale, 2007; Jin et al., 2006; Rauh, 2006). However, there has been a lack of studies exploring disclosures from alternative narrative sources in recent years (Donovan et al., 2021; Choi et al., 2020; Mayew et al., 2015; He, 2018; Athanasakou et al., 2023). The quality of narrative disclosure may lead to credit rating disagreements among Credit Rating Agencies (CRAs) due to the subjectivity in interpreting the information, stemming from higher levels of vagueness and uncertainty (Bonsall & Miller, 2017; Hájek et al., 2017; Hilscher & Wilson, 2016; Rich et al., 2021).

In this regard, understanding the importance of narrative disclosures related to pension information in credit rating assessments is crucial. Sponsoring firms stress the importance of pension information in the strategic report and its influence on the credit rating decision . Moreover, scholars emphasize the need to investigate the incremental impact of incorporating alternative sources, highlighting the necessity for further examination of financial information

beyond the footnotes to the financial statements. This aims to provide stakeholders and market participants with a valuable repository of textual resources (Cao et al., 2023).

1.2.1 IAS 19R and pension asset allocation

Defined benefit pension plans are a significant form of employee benefit, equally important to both sponsoring firms, who manage the plan, and employees who depend on it. In addition, defined benefit pension plans represent significant amounts in a firm's financial statements, suggesting that changes in pension accounting could significantly impact firms' decisions (Bergstresser et al., 2006; Jin et al., 2006). From the agency theory's perspective, managers of sponsoring firms are expected to manage the underlying assets in a way that serves their intentions. In addition, the flexibility in the pension accounting standards (IAS 19) allows sponsoring firms to manipulate the reported net income by using discretion in calculating the future expected returns from the underlying pension plan assets. As a result, they invest in high-risk assets to rationalize the expected returns.

The recent amendment to IAS 19R has introduced changes in the recognition criteria, which challenge managers to continue manipulating earnings, leaving them with higher pension risk without compromising it with a higher return. Therefore, a rational manager would be expected to reduce their investment in high-risk pension plan assets post-IAS 19R. This situation can be seen as having a real effect on sponsoring firms' investment decisions to accommodate these changes in accounting regulations.

In respect of accounting regulation practice, recent studies have examined the role of eliminating the ERR assumption as a mechanism for earnings management and replacing it with the discount rate and show that changes in pension accounting regulations may sway firms' allocation in pension plans, particularly by de-risking pension plans through a

reallocation of pension plan assets from high-risk assets such as equities (Amir & Benartzi, 1998, 1999; Anantharaman & Chuk, 2018; Barthelme et al., 2019; Vu, 2017) to fixed income securities, thereby restricting managers' ability to boost reported income through higher risk-taking investments in defined benefit (DB) pension plan assets.

Following the IAS 19R amendment, the evidence so far about its impact on DB pension asset allocation is inconclusive. While there is evidence that firms shift away from higher-risk assets such as equities towards fixed-income securities like bonds after the adoption of IAS 19R (Anantharaman & Chuk, 2018; Vu, 2017), other evidence indicates that the removal of the ERR assumption does not necessarily lead to a shift out of equities (Barthelme et al., 2019). Several factors, including differences in pension regulations, interest rates, funding requirements, and research design have been put forward to explain these inconsistent findings (Barthelme et al., 2019; Franzen, 2010; Laboul & Yermo, 2006). Moreover, most studies have focused on a single country context, raising questions about the generalisability of findings to broader constituencies of countries with different policy approaches to pension and related welfare systems (Boeri, 2002; Esping-Andersen, 1990; Ferrera, 1998; Sapir, 2006; Sengoku, 2004). Furthermore, there is insufficient evidence as well as a call by scholars (Barthelme et al., 2019) to examine opaque asset classes (known as o*ther assets*) and whether firms de-risk pension plans through a reallocation to *other assets* class. Despite this, it remains uncertain how firms respond differently to the switch from ERR to the discount rate, particularly in the context of them facing financial distress and institutional factors that may constrain managers' practices and decisions.

1.2.2 Corporate disclosure strategies and Unionisations

Trade unions usually play a significant role in advancing staff employability, protecting worker interests, and improving working conditions (Böheim & Booth, 2004; Freeman & Medoff, 1984; Green et al., 1999; Kaufman, 2004; Saundry et al., 2011). In addition, trade unions may collaborate with management to facilitate corporate operations when the shareholders' and employees' goals are aligned (Bronars & Deere, 1991; Chen et al., 2011; Freeman, 1984; Hirsch, 1991; Kaufman, 2004). However, when there is a lack of alignment with management, employees and their representatives may use various tactics, such as collective bargaining, lobbying, and industrial action, to make their voices heard and demand more benefits (Aobdia & Cheng, 2018; Chyz et al., 2013; Faleye et al., 2006; Verrecchia, 1983). Managers may perceive these activities as rent-seeking behaviour (Baldwin, 1983) and may seek to reduce the bargaining power of trade unions and their rent-seeking behaviour to improve their bargaining position with trade unions. This behaviour may potentially harm firms (Xing et al., 2017) and negatively affect shareholder value (Chantziaras, Dedoulis, & Leventis, 2020; Chantziaras et al., 2021; Chyz et al., 2013). Therefore, managers facing strong unionisation could try to gain a better bargaining position by adopting various strategies, such as altering information asymmetry (Bova et al., 2015; Cheng, 2017; Hilary, 2006; Scott, 1994), earnings management (DeAngelo & DeAngelo, 1991), and corporate investment and finance decisions (Denny & Nickell, 1991; Eberts, 1983; Fallick & Hassett, 1999), to convey an unflattering financial picture and secure concessions.

In the same vein, trade unions depend on financial disclosure narratives to convey a picture of firms' financial performance (Aobdia & Cheng, 2018). Therefore, managers may become apprehensive and reluctant to disclose information about their firms' performance to preserve their information advantage. This situation grants them a better bargaining position

(Bova et al., 2015; Cheng, 2017; Chung et al., 2016; Hilary, 2006; Kleiner & Bouillon, 1988). For instance, powerful unionisation may prompt firms to disclose information less frequently, particularly information about "good news" (Chung et al., 2016) and manipulate the disclosure tone of qualitative information in earnings press releases by using a less optimistic tone during labour negotiation periods (Arslan-Ayaydin et al., 2021) This indicates that managers appear to adopt alternative disclosure strategies to improve their bargaining position.

Furthermore, while prior studies mainly examine information related to firms' financial performance disclosed to the equity market (Bova et al., 2015; Cheng, 2017; Hilary, 2006; Scott, 1994), little is known about the impact of the quality and quantity of disclosure on stakeholders beyond equity market such as employee-related non-financial information (Aobdia et al., 2022; Blankespoor et al., 2020).

Given the importance of unionisation on disclosure quality and response to the call by Blankespoor et al. (2020) to examine the effect of disclosure processing frictions on non-equity market stakeholders, this study examines the impact of salient stakeholders, represented by a higher level of unionisation, on the transparency of pension information available in the strategic report as fundamental non-equity market stakeholders.

In addition, prior literature suggests firms with high cash balances may face challenges from trade unions during negotiation (Ahmad & Kowalewski, 2021; Klasa et al., 2009; Matsa, 2010). This suggests that higher unionisation may lead firms to hold fewer liquid assets to make more credible cases that less liquidity may threaten firms' viability, a situation that may grant firms more concessions from unions. However, firms may have high cash holding to facilitate transparency of information flow from management to trade unions (Brown, 2000; Kleiner & Bouillon, 1988; Mitchell et al., 1997; Robbins, 1994) due to resources available and may also

perceive the benefit of providing such information as mean of maintaining a positive relationship with employees.

1.2.3 Disclosure quality and credit rating decision

Disclosure and non-financial information are used by equity market users who rely on this information to assess firms and decide about their firm's performance. In particular, credit rating agencies (CRAs) incorporate several sources of financial and non-financial information into their processes of assessing firms' creditworthiness.

While previous literature has documented the importance of quantitative information (hard information) in predicting credit ratings (Akins, 2017; Bierey & Schmidt, 2017; Kim et al., 2013; Livingston et al., 2007; Spiceland et al., 2016), there is also evidence that qualitative information (soft information) such as corporate disclosures can also be informative. Qualitative information includes a substantial amount of unstructured narrative information, such as underlying accounting policies and reporting incentives. Narrative disclosures contain additional information contains about firms' fundamentals and stock price reactions that are added to standard quantitative information (Bonsall & Miller, 2017; Dyer et al., 2017; Hope et al., 2016; Li, 2008; McMullin, 2016). Specifically, attributes of narrative disclosure such as readability, tone, and specificity are significant predictors of default risk (Mayew et al., 2015; Merkley, 2014). Hence, qualitative information is expected to play a role in credit rating decisions.

Furthermore, pension information is an important element in the annual report and plays a central role in debt finance (Basu & Naughton, 2020; Kraft, 2015; Almaghrabi et al., 2020). While prior studies focused on using quantitative information to examine the creditworthiness of defined-benefit pension schemes (Anantharaman & Henderson, 2016; Campbell et al., 2012;

Cardinale, 2007; Jin et al., 2006; Rauh, 2006), there have been few recent studies that explored disclosures from alternative narrative sources (Donovan et al., 2021; Choi et al., 2020; Mayew et al., 2015; He, 2018; Athanasakou et al., 2023).

Given the substantial importance and complexity of pension information for CRAs (Basu & Naughton, 2020; Kraft, 2015), and the growing recognition of the need to study how different textual attributes of disclosure impact information transparency, as highlighted by the call from the British Accounting Review journal (Cao et al., 2023). The call emphasizes the importance of utilizing alternative sources beyond financial statements, such as managerial discussion and analysis (MD&A), earnings announcements, and annual reports, to provide firms' stakeholders and capital market participants with valuable text resources (Cao et al., 2023). This study aims to examine the impact of narrative attributes, in particular the pension information specificity in strategic reports, on credit rating decisions. The findings of this study can contribute to enhancing the transparency of pension information and shed light on how the pension information specificity in the strategic report can impact credit rating decisions.

In addition, altering the quality and quantity of pension disclosure could harm credit rating decisions, especially when firms seek multiple credit ratings. This could lead to credit rating disagreements between CRAs due to the greater extent of subjectivity in interpreting the information in the disclosure that arises from higher vagueness and uncertainty. For example, textual attributes such as readability and tone have been found to have an impact on credit rating decisions and rating disagreements (Bonsall & Miller, 2017; Hájek et al., 2017; Hilscher & Wilson, 2016; Rich et al., 2021). Therefore, it is important to understand whether more transparent and detailed disclosure can reduce the uncertainty and obfuscation of the disclosures, thereby enhancing the credit analysts' ability to assess pension liabilities and the firm’s ability to meet obligations.

While qualitative information is important in predicting default risk, credit analysts may have less incentive to incorporate credit risk-relevant information from qualitative disclosure because firms often use boilerplate language for non-financial disclosure, which means that the information in the disclosure is generic and may not provide new or relevant incremental information (Brown & Tucker, 2011) besides its higher processing cost. Moreover, regulators claim that strategic reports lack firm-specific information and that firms also use boilerplate language in their strategic reports (FRC, 2018, 2022; IASB, 2018; SEC, 1998), which can affect CRAs and users of strategic reports differently. This prompts this thesis to further investigate the impact of pension information quality (specificity) on whether it causes disagreement among CRAs.

1.3 Research Aims, Questions, and Objectives

This study aims to explore pension accounting and disclosure practices by investigating the financial reposting practice, disclosure practice toward employees and trade unions, and the implications of altering the quality of pension disclosure on capital market users.

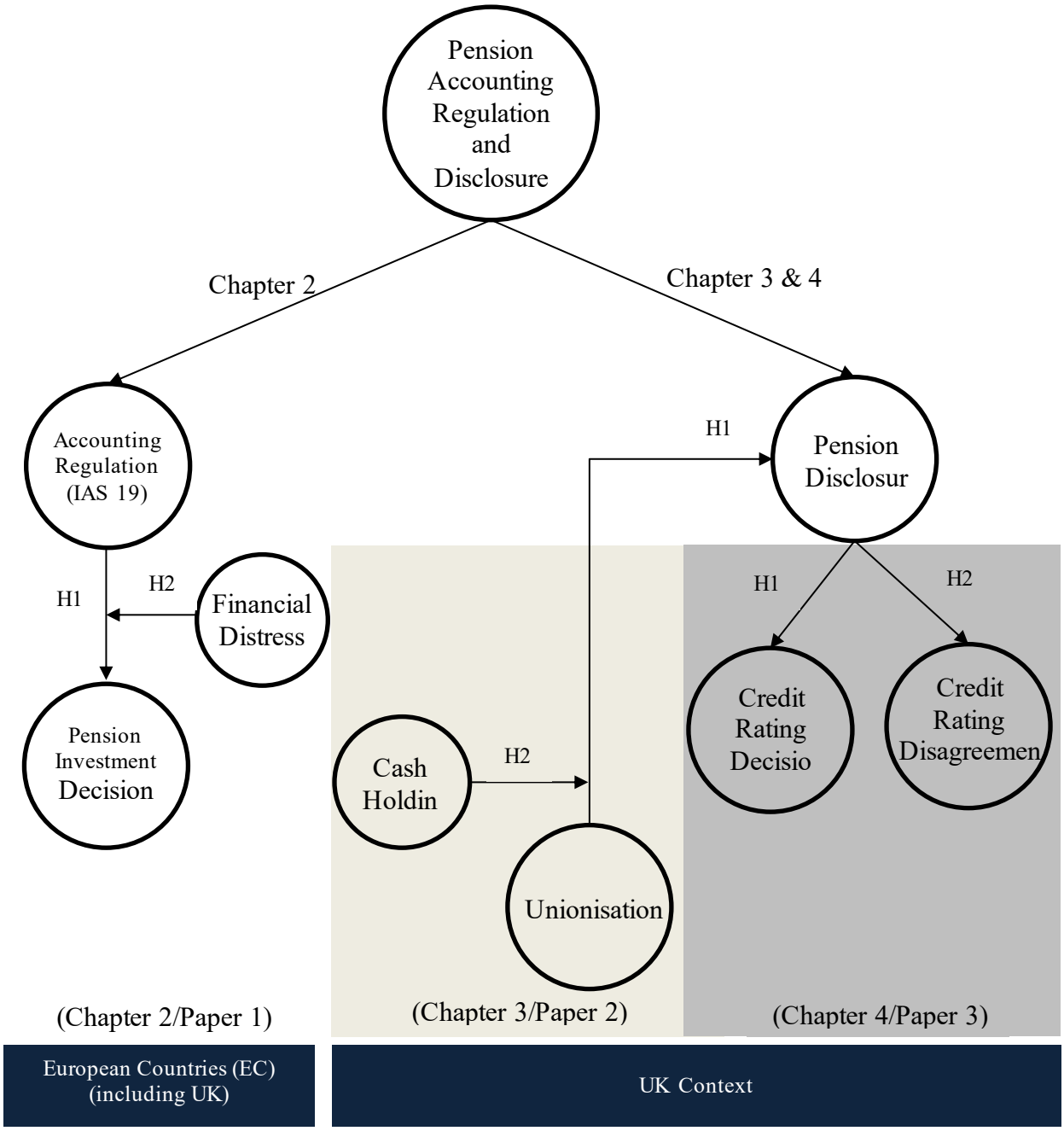
This thesis is constructed following the three-paper PhD format as shown in Figure 1.1, which seeks to address the following research questions:

1. Do regulatory policies matter to defined benefit pension de-risking strategy? (Chapter 2)
2. What is the influence of a firm's financial distress on the association between IAS 19R adoption and risk-taking behaviour? (Chapter 2)
3. Does unionisation have an impact on the quality of pension information? (Chapter 3)
4. Does the level of cash holding, if any, influence the relationship between unionisation and the quality of pension disclosure? (Chapter 3)

5. Do pension information quality and quantity influence the credit risk assessment? (Chapter 4)
6. If any, what is the impact of pension information quality and quantity on credit rating disagreement? (Chapter 4).

To achieve these aims, this study has adopted several theories during the investigation. Based on positive accounting theory and agency theory, this study first examines the real effect of changes in pension accounting standards on the de-risking strategies of pension plan assets. Secondly, informed by the stakeholder salient theory and collective agreement theory, this study examines the impact of strong unionisation on pension information quality. Thirdly, relying on signalling theory and behavioural decision theory, the study examines whether altering the quality and the quantity of pension disclosure can affect the credit rating decision by different CRAs resulting in disagreement between them.

Figure 1.1 The design of the thesis



1.4 Research Philosophy and Paradigm

Every research is based on some philosophical assumptions that underlie the research decision. A research methodology can be selected based on the paradigm which shares certain assumptions (Antwi & Hamza, 2015; Burrell & Morgan, 1979; Saunders et al., 2023). Burrell & Morgan (1979) suggest that the nature of social science comprises four elements: ontology, epistemology, human nature, and methodology. They claim that social science can be examined

from different perspectives, so assumptions can be examined from several aspects based on subjective or objective dimensions.

Ontology is concerned with the nature of reality and assumes that the world exists independently of individual perceptions (Burrell & Morgan, 1979; Saunders et al., 2023). This means that researchers assume existing facts and objectives can be measured and verified. In this regard, financial statements and financial information reflect the true picture of the business, which can be measured and verified regardless of the interpretations of different people. For example, examining the impact of accounting policies or disclosures on corporate decisions would rely on objective financial information that reflects the current performance of the firm. This perspective can be described as objective from the researchers' viewpoint, treating financial information and financial statements as independent of individual perceptions.

Meanwhile, epistemology can be described as the perspective that focuses on the nature of knowledge and the process by which knowledge is acquired and validated. It suggests that scientific knowledge is absorbed and transmitted through the viewer's consciousness. Epistemology primarily emphasizes the process of gathering knowledge and developing new, improved theories (Grix, 2002). Researchers employ various approaches to acquire knowledge, such as observations. For instance, accounting researchers may adopt an empirical approach and collect data through observations, interviews, or surveys to examine and understand the implications of changes in accounting regulations. Statistical analysis can be utilized to analyse the collected data and draw conclusions.

In addition, human nature explains the relationships between human beings, which can potentially be influenced or constrained by their surroundings. For example, if researchers

believe that companies are affected by their environment, they may examine how new regulations can impact their ethical practices, such as handling contaminations. This includes practices like hiding and manipulating facts, such as concealing oil leaks in oil companies. Conversely, if individuals or firms have personal agency, their decisions will reflect their personal or corporate social responsibility towards society.

While objectivity and subjectivity are positioned at the extremes of the spectrum, the underlying assumptions of each paradigm are explained. From an ontological perspective, objectivism assumes that social reality is external to social actors, who experience a homogeneous reality. In the accounting context, financial statements and financial information are expected to be free from personal bias, relying on observable and measurable facts that are independent of individuals' perceptions or interpretations. Therefore, financial information is considered neutral and unbiased, based on measurable facts that can be verified and replicated. For instance, subjective accountants adhere to specific accounting regulations such as International Financial Reporting Standards (IFRS), which provide objective guidelines ensuring consistency in serving multiple stakeholders.

In contrast, subjectivism advocates that social reality is constructed by individuals' perceptions and interactions. Social reality can be interpreted differently by different individuals, and subjectivists argue that multiplicity is experienced by all actors involved (Bernard & Bernard, 2013; Saunders et al., 2023). In the accounting context, this implies that the accounting outcomes of financial information may be subject to various interpretations, as accounting information is shaped by the intersection and interpretation of social actors. Thus, subjective accountants may consider the context and intentions behind certain accounting decisions and utilize interviews and surveys to capture the motives behind these decisions.

Similarly, from an epistemological perspective, while objectivists attempt to find the truth through social facts that can be observed and measured to generalise a law for social realities, subjectivism is keen on collating multiple narratives and opinions for different social realities through interaction with social actors (Bernard & Bernard, 2013; Saunders et al., 2023).

Researchers have identified two main paradigms: interpretivism and positivism (Guo & Sheffield, 2008). The positivist paradigm applies the methods of natural science to study social realities (Bell et al., 2022), which can measure the external social reality suggesting that positivism is considered a systematic approach that includes logical deduction and empirical observation of social actors' behaviour to establish causal law which promotes generalisation. For example, a positivist accounting researcher may collect financial information from a large sample of cross countries observations and analyse them using statistical methods and document any correlation or causal relationships. The findings can be generalised in a broader context.

In contrast, the interpretivism paradigm suggests an adequate deep understanding of social actors' actions (Bell et al., 2022; Saunders et al., 2023) due to the notion of differences between social actors. For example, interpretivism research may involve interviews with social actors such as managers and accountants to understand the process and the motives and factors behind their decisions to uncover the nuances of accounting transactions that cannot be fully captured solely through quantitative data.

Based on the above, this thesis is grounded in the epistemological dimension, specifically the positivist belief that a theory and an independent set of observation statements exist. These can be utilized to verify the truth of the theory. Therefore, this research employs a

deductive model of scientific explanation to identify causal relationships and regularities by utilizing a sample of observations. The methodology section will provide a comprehensive description of how this research investigates relationships related to accounting and disclosure reform in defined benefit pension plans, using a series of statistical tests.

1.5 Research Methodology

1.5.1 Choice of methodology

This study adopts a quantitative positivist approach and a deductive methodology to investigate the impact of accounting regulations, disclosure strategies, and credit rating decisions. In this regard, a set of hypotheses has been developed based on a review of prior literature and theoretical propositions. In addition, a statistical analysis is used to examine the relationships between variables using a large dataset, which aligns with the quantitative approach adopted in this study (Saunders et al., 2023).

In particular, the first paper examines whether the changes in pension accounting regulation (IAS 19R) and elimination of earning management mechanism demotivate manager to adopt de-risking investment strategies in their pension plan assets. Relying on a sample of European listed firms affected by IAS 19R, compared to a control group of US firms that share similar firms' characteristics but are unaffected by the standard between 2009 and 2014, using the difference-in-differences (DID) approach and entropy score matching to capture the impact of the accounting regulation amendment by sponsoring firms. In addition, the second and third papers, by relying on an automated content analysis approach using the programming language R and Python to evaluate and create a proxy for the specificity of defined benefit pension plan information (PIS) for 119 FTSE350 listed firms over the period 2017 to 2019. In addition, a proxy for disclosure specificity was created. This is followed by adopting different statistical

approaches such as ordered logistic regression, ordinary least square (OLS) and two stages least squares (2SLS) to examine factors that could influence the quality of disclosure specificity, as well as to identify whether altering the disclosure quality can affect credit rating differently result in crediting rating disagreement across CRAs.

1.5.2 Data collection and sampling

The data for the first paper comprises 505 firms over six years from 2009 to 2014 (Table 1.1), for both treatment and control samples, yielding 3030 firm-year observations. Previous studies have focused on a single-country context (Anantharaman & Chuk, 2018; Barthelme et al., 2019; Vu, 2017). However, this study offers an advantageous setting by using a broader constituency of 13 countries with different policies and approaches to pensions and related welfare systems (Boeri, 2002; Esping-Andersen, 1990; Ferrera, 1998; Sapir, 2006; Sengoku, 2004).

The data for the second and third papers were collected manually from 350 top UK-listed companies for the period between 2017 and 2019 (Table 1.1), which was the latest year before the Covid-19 pandemic. However, there were some difficulties in collecting data due to the lack of availability of the strategic report and annual report in the same place. Collecting pension information from the strategic report was challenging because the report is often unstructured, requiring manual data collection. In some cases, reports were secured, meaning that data could not be copied, and further steps were required to obtain the data to avoid wasting observations.

Table 1.1 Summary of data collection

Chapter	Samples	Observations	Data Sources
2	505	3030	Bloomberg & Thomson Reuters
3	119	357	Annual reports/Strategic reports

			Manually /Computerized generated score using Python and R Office for National Statistics (ONS) Bloomberg
4	119	357	Annual reports/Strategic reports Manually /Computerized generated score using Python and R Bloomberg

1.5.3 Data analysis

In this research, several statistical techniques have been adopted to analyse the relationship between several factors and accounting regulations and disclosure quality. Specifically, in the first paper, DID and entropy score matching techniques are used to match the treatment sample and control sample. In the second and third papers, a measure for pension disclosure specificity has been constructed following Hope et al. (2016) and Dyre et al. (2017). In particular, the second paper examines the role of unionisation on the quality and the quantity of pension disclosure, while paper three examines the impact of variation in the quality and the quantity of pension disclosure specificity on the credit rating decision and disagreement when firms seek multiple credit rating from different CRAs. Papers two and three use OLS, descriptive statistics, correlation matrix, and two-stage least squares (2SLS) together with other tests to ensure the validity of the statistical results.

1.6 Research theories

In the second chapter (Paper 1), two fundamental theories in accounting, agency theory and positive accounting theory, have been harnessed to shed light on various facets of financial reporting practices within organisations.

Agency theory (Jensen & Meckling, 1976) delves into the intrinsic conflict of interest that often arises between principals, or shareholders, and agents, or management. This tension

emerges from differing self-interests and risk inclinations. The theory contends that managers may exploit the discretion afforded by accounting standards to manipulate reported earnings in a manner aligned with their personal objectives, potentially at the expense of shareholders' interests.

In the context of pension accounting, the adoption of the revised IAS 19R standards is of particular relevance. The removal of the earnings management assumption signifies a shift in firms' ability to engage in earnings management with respect to pension plans, possibly through the adoption of a more opportunistic expected rate of return. This underscores the pivotal role that accounting standards play in influencing potential conflicts of interest between managers and shareholders. The elimination of the ERR assumption, for instance, signals more transparency regarding future anticipated income.

Positive accounting theory (Watts & Zimmerman, 1986) posits that managers strategically adjust reported earnings to attain specific organisational outcomes, such as achieving a targeted level of earnings growth. This theory recognises the discretionary latitude that managers possess in selecting accounting methods, enabling them to wield influence over reported earnings. Consequently, managers may adapt their decisions to capitalise on or mitigate the adverse consequences of existing flexibility within accounting regulations.

In pension accounting, this theory is pertinent as managers may manipulate reported earnings by employing a higher expected rate of return, leveraging the flexibility provided by accounting regulations. This implies that shifts in pension accounting standards can serve to curtail earnings manipulation by removing the ERR mechanism, thereby constraining managers' discretion in managing earnings.

The application of these theories in the context of pension accounting extends their traditional scope by illuminating how alterations in accounting standards, particularly with regards to the treatment of pension plans, can impact the dynamics of managerial decision-making and its consequences on financial reporting. Specifically, the removal of the ERR assumption demonstrates how changes in accounting regulations can directly influence the balance of interests between principals and agents.

In the third chapter (paper 2), we examine the interplay between unionisation, transparency of financial information, and stakeholder dynamics through the lens of Stakeholder Salience Theory and Collective Bargaining Theory.

Collective Bargaining Theory (CBT) posits that trade unions act as advocates for their members, negotiating with management on their behalf to secure favourable terms and conditions (Feller, 1973). Within the realm of employee benefits, particularly pension schemes, CBT asserts that detailed information in annual reports bolsters the bargaining power of trade unions. In essence, the transparency of information regarding pension schemes strengthens the trade union's position when negotiating equitable benefits for members. Additionally, detailed pension information empowers trade unions to scrutinize management performance and hold them accountable for funding the scheme. Consequently, CBT suggests that heightened unionisation may lead to more specific disclosure of pension information, given the bargaining leverage trade unions wield in compelling management to provide detailed information.

The concept of Stakeholder Salience initially articulated by Freeman (1984) and subsequently extended by Mitchell et al. (1997). The Stakeholder Salience Theory seeks to elucidate the intricate relationship between organisations and diverse groups of stakeholders. This theory posits that organisations are beholden to multiple stakeholders, encompassing

shareholders, customers, employees, suppliers, and the broader community, each possessing distinct interests and expectations. Central to this theory is the concept of stakeholder salience, which contends that stakeholders vary in their level of significance to an organization. Mitchell et al. (1997) further delineate three pivotal determinants of stakeholder salience: the stakeholder's capacity to exert influence over the firm, the legitimacy of their connection, and the urgency of their claim on the firm. Organisations, in turn, align their priorities with these dimensions to fulfill stakeholders' expectations. Notably, these dimensions are dynamic and evolve in tandem with shifts in organisational goals, strategies, and the external environment. This theoretical framework addresses an initial limitation of stakeholder theory by discerning which stakeholder(s) hold paramount importance.

From a unitarist standpoint, trade unions emerge as vital representatives of employees, positioning them as primary stakeholders (Brown, 2000; Clement, 2005; Mitchell et al., 1997). This perspective underscores employees' pivotal role as business partners, investing their time and expertise to foster the company's growth and prosperity (Chen et al., 2016; Edmans, 2011; Faleye & Trahan, 2011; Hasan et al., 2018; Wei et al., 2020).

Integrating these theories, it is plausible to infer that trade unions exert significant influence over firms' disclosure strategies, especially concerning employee-centric matters such as pension information. In organisations with a robust trade union presence, unions may be better positioned to negotiate for greater specificity in the information pertaining to pension plans. This, in turn, augments their bargaining power during collective agreements. Together, these theories provide a robust framework for understanding how accounting disclosure practices are influenced by, and in turn, impact the interests and objectives of trade unions within the organisational context. They shed light on the interplay of stakeholders, accounting practices, and employee representation in shaping financial reporting dynamics.

In paper 3, Behavioural Decision Theory (BDT) and Signalling Theory (ST) have been adopted to provide insights into the potential biases in credit rating analysts' decisions when assessing soft information, such as pension information specificity to conclude soft adjustments.

BDT , as articulated by Tversky and Kahneman (1973), discussed the systematic biases and heuristics that influence decision-making processes. This theory has been instrumental in accounting research, particularly in examining how cognitive biases, including confirmation bias and overconfidence, impact financial decision-makers. When applied to the context of pension accounting, BDT offers a valuable perspective on the evaluative processes of credit rating analysts. In the pension accounting context, BDT reveals how credit rating analysts, subject to cognitive biases, may inadvertently give disproportionate weight to specific aspects of pension information. For instance, anchoring or confirmation biases may lead to skewed credit assessments. This provides a nuanced understanding of how psychological factors can influence financial decision-making, particularly in the evaluation of pension information.

The application of BDT in pension accounting extends its relevance by providing deeper insights into how analysts' decision-making processes may be influenced by these systematic biases. This enrichment of the existing body of knowledge sheds light on how psychological factors impact financial decision-making, specifically in the realm of pension accounting. Furthermore, BDT significantly contributes to our understanding of pension accounting and credit rating by highlighting the potential impact of psychological biases on the credit rating process. By acknowledging the presence of these biases, analysts can implement measures to mitigate their effects, ultimately enhancing the accuracy and reliability of credit ratings in the context of pension accounting.

Signalling Theory (Spence, 1973) centres around the concept of information asymmetry and the strategic use of signals to convey unobservable characteristics. Within the domain of accounting, ST has found extensive application in understanding how firms strategically communicate information about their financial health and management competence to influence stakeholders' perceptions.

Applying Signalling Theory to pension accounting expands its domain, demonstrating how firms use pension-related disclosures. Transparently disclosing funding status and future contribution plans signals prudence in the funding arrangement, highlighting strong cash management practices that reduce default and pension risks. This can potentially impact credit rating assessments.

1.7 Research Findings

Chapter 2 examines the implications of IAS 19R for European firms' allocation of defined benefit (DB) pension plan assets. After controlling for various factors, the analysis shows that European companies reduce pension risk by shifting out of equities after IAS 19R. In addition, Companies experiencing financial distress tend to shift out of equities more than financially healthy companies.

The study also analyses the impact of changes in pension accounting standards on the allocation of pension plan assets across various pension models. The results show a significant shift-out of equity under the Anglo-Saxon and Continental models, while the Mediterranean and Nordic models exhibit an insignificant shift-out of equities. In the following analysis for the *other assets* class, the study finds a noticeable reduction in the allocation of pension plan assets to Real Estate across Anglo-Saxon, Continental, and Mediterranean pension models post-IAS 19R. There is also an increase in fixed-income securities in both Anglo-Saxon and

Mediterranean models. Moreover, the Anglo-Saxon model and the Nordic model show an increase in the allocation of pension plan assets to hedge funds and Alternatives, respectively. At the country level, there is variation across countries that follow similar welfare models. For example, private equity and hedge funds are only available in Norway. Additionally, there are noticeable differences in the presentation of pension investments for the Real Estate class at the country level, such as in Spain and the Netherlands. Furthermore, there has been an increase in fixed-income securities in Ireland and the UK. In summary, this study provides insights into the impact of IAS 19R on the allocation of pension plan assets across different asset classes and pension models in a European context, highlighting the importance of firm-specific factors and the variation across countries in determining pension asset allocation decisions.

Chapter 3 first examines the effect of disclosure processing frictions on non-equity market stakeholders, particularly, the impact of salient stakeholders, represented by a higher level of unionisation, on the transparency of pension information available in the strategic report as fundamental non-equity market stakeholders. The findings show that there has been a decline in the pension information specificity in the strategic report over the years, despite an increase in the report length. Trade union density shows a positive association with pension information specificity, suggesting that the presence of salient stakeholders improves the quality and quantity of pension information.

In addition, this study investigates the impact of the level of cash holding on the association between unionisation and pension information specificity. The findings suggest that the relationship between unionisation and pension information specificity is stronger when sponsoring firms to have higher cash holdings; potentially because they have more resources to do so and may also perceive the benefit of providing such information as a mean of

maintaining a positive relationship with employees and improving their bargaining position with trade unions.

Chapter 4 first examines the impact of narrative attributes (specificity) of pension information from the strategic reports on the credit rating decision. The study shows that there is a negative association between the pension information specificity and credit rating decision. This suggests that when firms provide more specific pension information, they are more likely to obtain a lower credit rating decision (i.e., downgrading). This result is consistent with previous literature that shows firms obtain credit rating downgrading when they provide more qualitative disclosure (Bonsall & Miller, 2017; Bozanic et al., 2022).

In addition, this chapter investigates the impact of pension information quality (specificity) on whether it causes disagreement among CRAs. The finding reveals that greater pension information specificity reduces rating disagreement, particularly when the ratings are two notches or higher. This demonstrates that while pension information specificity may result in credit downgrading, it also results in less uncertainty and disagreement among CRAs.

1.8 Research Contributions

This study makes a significant contribution to literature, methodology, and theory in the area of financial reporting and disclosure practice for equity and non-equity stakeholders.

First, this thesis contributes to the literature on the role of accounting regulations and disclosure strategies by providing factors, determinants and consequences that influence firms' financial reporting and disclosure practice (Leuz & Wysocki, 2016; Shakespeare, 2020). This study provides a substantial development of a previous paper studying the economic consequences of changes in pension accounting regulation (IAS 19R) (Amir et al., 2010; Amir & Benartzi, 1999; Anantharaman & Chuk, 2018; Barthelme et al., 2019; Kiosse & Peasnell,

2009). While the current studies provide evidence on the implication of IAS 19R on the allocation of pension plans at single country level (Anantharaman & Chuk, 2018; Barthelme et al., 2019; Vu, 2017) suggesting that the social and welfare system may influence the impact of changes in pension accounting and firms' de-risk pension plan risk post-IAS 19, this thesis provides evidence that firms reduce pension plan risk post-IAS 19R using the traditional mechanism through shift-out equities.

Additionally, the study provides evidence that firms' financial distress is considered a significant factor that influences the allocation of pension plan decisions. Moreover, this study examines a less explored area by examining the practice of sponsoring firms when shift-out equities and the behaviour towards *other assets* class (Amir et al., 2010; Barthelme et al., 2019). The results show that, although firms reduce the allocation of pension plan assets to reduce pension plan risks, in some cases, this reduction is coupled with increases in high-risk categories such as alternative investment which includes an equity investment in their portfolio, suggesting that the pension plan risk is still high.

Second, this study explores another lens of defined benefit pension plans by giving closer attention to the pension information and disclosures in the annual report. This thesis provides an overview of the importance of strategic pension information on the user of the annual report to form their decisions. In particular, this study provides evidence for the importance of pension information to non-equity stakeholders such as trade unions (Blankespoor et al., 2020) and how they may leverage such disclosure by assessing the sponsoring firms' current performance to gain higher bargaining power. While prior studies have raised concerns about the marginalisation of the role of employees in corporate reporting (Chantziaraset al., 2020; Vithana et al., 2021), this study provides more direct evidence for the impact of trade unions as a salient stakeholder on the quality of disclosure in a narrative report.

In response, firms' response alters their disclosure strategy by altering the quality of pension information to hold an information advantage when facing strong unionisations. Specifically, the results show that when the labour-related proprietary cost is high, firms disclose high-quality and more specific disclosure.

Third, this study provide a methodological contribution suggesting that incorporating text specificity as an attribute in credit rating assessments can reduce information asymmetry and uncertainty and improve transparency (Ederington, 1986; Morgan, 2002). In particular, focusing on specificity of the text as a narrative attribute helps credit rating agencies to minimise the need for subjectivity that arises from judgment, resulting in less disagreement among rating agencies because of reduced uncertainty in credit rating decisions (Hope et al., 2016). Moreover, in the context of pension practice, this study examines the relevance of pension-related information in strategic reports as a new source of information in credit rating assessments (Anantharaman & Henderson, 2016; Campbell et al., 2012; Cardinale, 2007; Jin et al., 2006; Rauh, 2006; Almaghrabi et al., 2020; Basu & Naughton, 2020; Kalogirou et al., 2021). This is important for stakeholders and capital market participants, as it contributes to the credit rating assessment process for default risk and access to capital (Donovan et al., 2021; Choi et al., 2020; Donovan et al., 2021; Mayew et al., 2015; He, 2018; Athanasakou et al., 2023).

While the current evidence focuses on the influence of textual attributes in the credit rating process such as readability and tone (Dyer et al., 2017; Franco et al., 2015; Li, 2008; Rich et al., 2021), this study extends the current literature by providing evidence for the importance of *Specificity* as another textual dimension of transparency in the credit rating process. This study also responded to the concerns of rising vagueness of narratives disclosures by illustrating how information specificity can provide a complementary dimension of

disclosure quality (FRC, 2018, 2022; IASB, 2018; SEC, 1998) by providing evidence on how firms use different disclosure strategies across the strategic report, which can impact CRAs and users of strategic reports differently.

Lastly, this thesis, particularly in papers two and three, provides a methodological contribution to the pension disclosure practice and the measure of pension disclosure. While the current pension disclosure proxies are based on a list of mandatory requirements of IAS 19R in the footnotes of the financial statements (Almaghrabi et al., 2020), this study contributes to the pension accounting literature by providing an alternative mechanism to examine the quality of pension disclosure. Drawing on the narratives of pension information within the strategic report as a new dimension of the quality of pension disclosure, particularly firms have become more reliant on non-financial disclosure from narrative information (Noh et al., 2019) as a mechanism to reduce information asymmetry and improve decision-making (Healy & Palepu, 2001). This study contributes to the literature on textual analysis by using an alternative method of measuring pension disclosure quality. While prior studies have extensively examined the quality of qualitative information such as readability (Li, 2008), length (Dyer et al., 2017), and boilerplate (Cazier & Pfeiffer, 2017; Dyer et al., 2017), there is a lack of research on other qualitative disclosure characteristics such as specificity (Cazier & Pfeiffer, 2017; Dyer et al., 2017; Hope et al., 2016) (see Appendix 3.2 and 3.3 for further details).

1.9 Structure of the Thesis

This thesis consists of five chapters. The current chapter (i.e., chapter one) is an introduction to the thesis and has highlighted an overview of the study including the research aims and objectives. In addition, a general literature review about pension accounting amendment together with disclosure determinants and consequences. An overview of the

research philosophy and paradigm together with theories and methodologies, then lastly, the contributions of the thesis.

The second chapter (see Figure 1.1) discusses the first and second research questions, which examine the real effect of accounting regulation amendments and the elimination of an earnings management mechanism on the de-risking strategies of pension plan assets. This chapter is based on data samples from 3030 firm-year observations for treatment and control samples over six years (2009-2014) and suggests several factors that could influence firms' de-risking strategies.

The third chapter (see Figure 1.1) focuses on the role of non-equity stakeholders in firms' disclosure strategies. This chapter is underpinned by stakeholder salient theory and collective bargaining theory to investigate whether the presence of unionisation alters firms' disclosure strategies to accommodate their power. In this chapter, a textual analysis approach has been adopted to measure the disclosure quality in the strategic report. The selection of textual attribute measurement and models is explained, followed by the findings, discussion, and conclusion.

The fourth chapter (see Figure 1.1) adopts agency theory together with behavioural decision theory to explore the role of the subjectivity of strategic disclosure on credit analyst decisions in the UK context. This chapter demonstrates the role of pension information quality on creditworthiness. Additionally, the role of variation in disclosure quality and quantity on the issuing of different credit ratings when firms seek multiple credit ratings is explored.

The last chapter presents a summary of the entire thesis and draws conclusions and implications for policymakers and regulators, together with highlighting some limitations and recommendations for future research.

Chapter 2: Effect of IAS 19R on pension asset allocations – the role of financial distress in a European Context

ABSTRACT

Purpose

Recent amendments to IAS 19 seek to address earnings management practices and risk-taking strategies in pension plan investment. Focusing on the change that sponsoring firms are not able to set expected rate of return (ERR) assumptions, this study investigates the real economic consequences of such changes on pension investment strategy and the moderating effect of the firms' financial distress on this relationship.

Design/Methodology/Approach

Using difference-in-differences and entropy score matching approaches, this study employs a sample of (i) a treatment group of listed firms with active DB plans from 13 European countries (EC) countries and (ii) a control group of U.S. firms with active DB plans. The pre-treatment period is 2009-2011, and the post-treatment is 2012-2014, which yields 3,030 firm-year observations to examine how pension plans and firm characteristics are related to the allocation decision and the asset class of the pension plan.

Findings

Extending the literature on the real effects of changes in accounting standards on firms' decisions, this study finds that firms shift out of equities post-IAS 19R pension accounting reforms. In addition, firms in financial distress are more likely to shift out of equity investments to de-risk pension plan risk in line with the risk management perspective. Furthermore, the study examines and finds evidence for the allocation of pension plan assets in asset classes other than equities and bonds (i.e., *other assets*). Finally, the results show that changes in accounting regulation vary across countries post-IAS 19R, which are in part driven by the prevailing welfare system. Overall, the study demonstrates that the economic consequences of IAS 19 on pension asset allocation are subject to the firm's financial health and the country's welfare system.

Keywords

IAS 19R; defined benefit pension plans; expected rate of return; pension asset allocation.

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2.1 Introduction

The traditional pension accounting model under the *International Accounting Standard 19 – Employee Benefits* (IAS 19) allowed a substantial component of pension expenses to be determined by managerial assumptions, notably with regard to the expected rate of return (ERR). This mechanism allows discretion in pension plan asset returns, leading to potential earnings management (An et al., 2013; Asthana, 2008; Bergstresser et al., 2006; Comprix & Muller, 2011; Rauh, 2006). Consequently, sponsoring firms could choose to invest in higher-risk assets, such as equities, to achieve higher equity premiums hence justifying a higher ERR (Glaum & Giessen, 2009; Gold, 2005; Rauh, 2006) and opportunistically maximise shareholders' benefits (Asthana, 2008; Bergstresser et al., 2006; Jensen & Meckling, 1976).

Following the recent changes in pension accounting standards (i.e., IAS 19R) that eliminate the ERR assumption and replace it with a discount rate, managers cannot boost reported income by engaging in higher risk-taking in defined benefit (DB) pension plan assets (Anantharaman et al., 2021; Anantharaman & Chuk, 2018). However, evidence of the impact of eliminating the ERR assumption (i.e., IAS 19R) on DB pension plan asset allocation is somewhat inconclusive. For example, Anantharaman & Chuk (2018) reveal that Canadian firms shifted out of higher-risk assets (i.e. equity) towards fixed-income securities (i.e. bonds) following the adoption of IAS 19R. In contrast, Barthelme et al. (2019) find that removing the ERR assumption in Germany does not result in a shift out of equities, suggesting that the effect of changes in accounting standards differs across countries. This variation in the effects of ERR assumption changes could be explained from different perspectives, such as the differences in pension regulations, interest rates, funding requirements (Franzen, 2010; Laboul & Yermo, 2006), and research design differences (Barthelme et al., 2019). The reason for this variation could be partially explained by the spread between the ERR plan assets and the discount rate,

in which sponsoring firms will reduce (increase) their investment in high (low) risk assets if the gap is large (small).

Whilst these studies largely focus on a single country context, it remains unclear whether the findings are generalisable to a wider geographical context. Furthermore, it remains unclear whether firms may respond differently to the switch from ERR to the discount rate, particularly when they are experiencing financial distress and when managers' practices and decisions are bounded by some institutional factors.

Specifically, this study aims to examine the implications of IAS 19R in a European context. Furthermore, this study examines whether firms in financial distress adopt different strategies for allocating their DB pension plans post-IAS 19R. It is argued that, in addition to changes in regulatory and accounting rules, the shift towards lower-risk investment strategies is also driven by firms' financial health in line with the risk management perspective. Plan sponsors thus have incentives to limit the negative impacts of financial distress on pension investment policy by reducing riskier assets (i.e., equities) and allocating more assets towards fixed-income securities (Amir et al., 2010; Rauh, 2009). As a result, firms in financial distress are likely to engage in investment strategies that reduce the risk associated with their pension plans to minimise pension risks.

To achieve the research objectives, the empirical analysis draws upon a sample of listed firms from 13 European countries (EC) between 2009 and 2014. Following McMullin & Schonberger (2020), the DID and entropy score matching approaches are adopted to compare and match plan asset allocations across EC-listed firms (the treatment group) to US firms (the control group) for the pre-period (2009 to 2011) and post-period (2012 and 2014). The analysis reveals, after controlling for various firms, plans, and institutional characteristics, that EC firms

reduce risk by shifting out of equities in pension plans post-IAS 19R relative to US firms, consistent with the literature prior to this study. However, the results show that firms show a greater shift-out of equity after IAS 19R when financial distress is high. Furthermore, several robustness analyses have been applied by further controlling for other macroeconomic and corporate governance mechanisms, and the main findings, in general, remain unchanged. Thus, the results naturally support the argument that EC firms reduce pension risk by shifting out equities in pension plans post-IAS19R relative to US firms, and this decision is more likely to be made by firms that are experiencing financial distress.

It has been observed that the allocation of pension plan assets varies across European countries. After conducting additional cross-sectional analyses of different pension models (Anglo-Saxon, Continental, Mediterranean, and Nordic), the results show a significant shift-out of equity under both the Anglo-Saxon and Continental models. Whilst the Mediterranean and Nordic models show an insignificant shift-out of equities, there is an increase in fixed-income securities and cash under the Mediterranean model. At country level, there is a significant shift-out of equities in Ireland and the UK post-IAS 19R. At welfare model level, the Nordic model does not show a significant shift-out of equity investments; however, the findings show a significant shift-out of equities in both the Netherlands and Sweden. Although there is no evidence that sponsoring firms in Spain shifted out of equities, there is a noticeable increase in real estate investment coupled with a reduction in cash investment. In contrast, Dutch sponsors rebalance pension plan assets from equities and real estate investments to fewer risk assets, such as cash investments.

Since the results reveal some interesting patterns in the type of assets that firms may use in their pension plans, this study further investigates the impact of changes in pension accounting standards on the allocation of pension plan assets to *other asset* classes. *Other assets*

classes may contain a combination of high-risk assets (such as hedge funds) and low-risk assets (such as cash and loans) which gives rise to some obfuscation in terms of evaluating the risk characteristics and volatility of this residual category (Gold, 2005; Hall, 2000). The last few decades have seen a growing trend in pension investment in the *other assets* class (Amir et al., 2010; Amir & Benartzi, 1999; Mercer, 2014, 2020). In 2014, the average equities and bonds were 34% and 52%, respectively (Mercer, 2014, p8), whilst, in 2020, the average equities and bonds were 22% and 54% respectively (Mercer, 2020, p7). These figures show a growing trend in investment in *other assets* class by nearly 71% (from 14% to 25%) between 2014 and 2020, in particular, firms show significant growth in Alternative (i.e., high-risk assets) (Appendix 2.3). Therefore, the claim of pension plan assets re-allocation from equity to the *other assets* class to reduce pension risk depends on the characteristics of the assets in the *other assets* class. Since the changes in pension risks through re-allocation from equities to *other assets* depend on the mix of assets in that class, it could be argued that firms may use the *other assets* class as a backdoor vehicle to shift the higher risk of their investment in equities to another(other) high-risk asset(s) under this opaque asset class. However, there is a lack of evidence on the pattern of allocation of the pension plan to the *other assets* class due to a lack of detailed disclosure requirements (Anantharaman & Chuk, 2020; Barthelme et al., 2019).

In cross-sectional analysis, the findings using the welfare system categorisation reveal that there is a noticeable reduction in the allocation of pension plan assets in the real estate class across Anglo-Saxon, Continental, and Mediterranean pension models post-IAS 19R. In addition, there is an increase in fixed-income securities in Anglo-Saxon and Continental. Indeed, the Anglo-Saxon and Continental models are consistent with the main results and shift out of equities. However, there is also an increase in the allocation of pension plan assets to hedge funds and alternatives in the Anglo-Saxon and Nordic models, respectively.

However, at country level, there is variation across countries that follow similar welfare models. Sponsoring firms in each country exhibit different patterns of investment in the *other assets* class. For example, private equity and hedge funds are only available in Norway and the UK. Additionally, there are noticeable differences in the presentation of pension investments for the real estate class at country level, such as in Spain and the Netherlands. Furthermore, there has been an increase in fixed-income securities in Ireland and the UK.

The current study offers several contributions. Firstly, this study provides evidence of the impact of changes in accounting standards on firms' decision-making. Specifically, it extends previous literature on pension accounting (Amir et al., 2010; Amir & Benartzi, 1999; Anantharaman & Chuk, 2018; Barthelme et al., 2019) by investigating the impact of changes in the pension accounting standards on the allocation of pension plans under a cross-country context. Studies in this stream explore how removing earnings management devices (i.e. discretion on ERR assumptions) alters the costs and benefits of excessive equity allocation in pension plans in a single context (Anantharaman & Chuk, 2018; Barthelme et al., 2019; Vu, 2017). It is argued that the revised pension accounting standard IAS 19R has had an impact on the derisking strategies of the plan assets allocation. However, their findings are based on a single country (i.e., Canada, Germany, and UK) and the findings of these studies are country-specific due to several reasons such as differences in welfare system. This study extends previous literature by showing that the effect of changes in pension accounting standards on firms' pension investment strategies is generalisable in a European context. Specifically, the elimination of earning management devices, in general, gives rise to a reduction in pension risk and firms adopt pension de-risking strategies to reflect this risk.

Secondly, previous literature suggests that firms in financial distress, in general, are more likely to adopt income-smoothing approaches (Campa & Camacho-Miñano, 2015; Li et

al., 2020; Watts & Zimmerman, 1986, 1990; Zang, 2012) suggesting that financially distressed firms may opportunistically use ERR assumptions to manipulate reported income. However, the risk management perspective suggests that firms in financial distress reduce their pension risk by investing in lower-risk assets (Rauh, 2009). This study contributes to the literature on the real effects of changes in accounting regulation, showing that the elimination of the ERR assumptions restricts the earnings management behaviour of sponsors in financial distress. Moreover, the result shows that sponsors in financial distress adopt pension de-risking strategies post-IAS 19R (An et al., 2013; Billings et al., 2017), suggesting that a firm's financial health plays an instrumental role in influencing pension investment strategy.

Thirdly, this study contributes to the pension accounting literature by exploring the asset classes that firms may use to allocate pension plan assets when shifting-out of equities. Previous studies focus on the allocation of pension plan assets between equities and fixed-income securities (Amir & Benartzi, 1998, 1999; Chircop & Kiosse, 2015), suggesting the ideal mix of the allocation between equities to debt suggested to be 60 to 40 % (Amir & Benartzi, 1999). However, less attention has been given to the residual assets class due to their insignificant weight. Given the size of *other assets,* the class has grown by 291% from 4.6% in 1994 (Amir & Benartzi, 1999) to 18% in 2020 (Mercer, 2020). Thus, closer attention and more detailed examination are needed to better understand the risk characteristics of this opaque asset class. While prior studies provide evidence that sponsoring firms shift out of equities in response to changes in the pension accounting regulation (Anantharaman & Chuk, 2018), it is unclear whether sponsoring firms use the *other assets* class to diversify pension risk or as a vehicle to obfuscate high-risk investment in pension plan assets post-IAS 19R. Therefore, this study contributes to this stream of literature by providing evidence that firms also re-allocate to cash, real estate, alternatives, and hedge fund as a way of managing pension risks.

Lastly, this study contributes to the pension investment literature by documenting how pension investment decisions may vary depending on the country's welfare systems (Boeri, 2002; Esping-Andersen, 1990; Ferrera, 1998; Sapir, 2006; Sengoku, 2004), suggesting that dimension of social welfare characteristics may play a role in adopting changes to the accounting regulations. The findings of this study document that the impact of changes in accounting regulation varies depending on the social welfare system. Hence, the findings show that it is important to understand the impact of changes in accounting regulations on firm investment strategies by considering the institutional dimension.

The rest of the chapter is structured as follows. Section 2.2 provides the background and previous literature. Section 2.3 explains the theoretical framework and hypotheses development. Section 2.4 sets out the research design and sample selection procedures. Section 2.5 presents the main results, additional analysis, and sensitivity analysis for robustness, and section 2.6 provides the conclusions and implications of this study.

2.2 Background and Literature Review

2.2.1 Background IAS 19R

International Accounting Standard (IAS) 19, "Employee Benefits," governs firms' Defined Benefit (DB) plans. The standard was initially adopted in 1998 and amended in June 2011 (IFRS Foundation, 2011), mandating IAS 19R to replace IAS 19.

Pre -IAS 19R

Prior to IAS 19R, the net pension cost of the DB plan was determined by offsetting pension expenses (i.e., service cost and interest) by the expected return from the DB plan. However, pension expenses were determined by multiplying the pension obligation by the discount rate, and pension return was determined by multiplying pension plan assets by the Expected Rate of Return (ERR), for which the ERR assumptions were determined based on management predictions of future performance, allowing considerable discretion in valuing the return on pension plan assets.

The pension obligation of the DB plan is determined based on an annual actuarial valuation, which uses the discount rate to calculate the present value of benefit payments. Other factors, such as market performance and life expectancy, could affect the pension obligation, resulting in actuarial gains and losses (AGLs). IAS 19 offers three options for firms to recognize AGLs. First, AGLs are deferred as an off-balance sheet element and amortized in the income statement when the accumulated unrecognized AGLs exceed a certain threshold (corridor method). Second, immediate recognition in other comprehensive income (OCI method). Finally, AGLs are immediately recognized in profit and loss. It's worth noting that in the case of recognizing the AGLs in OCI, both versions of the standard (IAS 19 and IAS 19R) do not permit recycling into the income statement.

Sponsors of DB plans need to make assumptions about various parameters of their pension plans such as longevity, employment turnover, inflation, retirement age, etc. One of the fundamental economic assumptions of pension plan assets is the long-term ERR. Ideally, ERR should be defined as a function of pension plan characteristics, such as the allocation of pension plans or demographics for the pool of pension plan beneficiaries. However, if plan sponsors manage pension plans as an integral part of their general financial management, factors outside the plan could play a role in making these assumptions. Therefore this assumption varies systematically with firms' conditions, such as the level of cash holding, suggesting that firms with lower liquidity make more aggressive return assumptions for their pension plans (Bartram, 2018)

Pre-IAS 19R, the standard promoted earnings smoothing through ERR assumption. This accounting choice allowed sponsoring firms to recognise the expected pension return in the income statement to improve reported earnings as it did not reflect the actual pension cost and return from the pension investment strategy, which encourages firms sponsoring DB plans to invest in high-risk assets such as equities. This mechanism thus shielded income statements from expected pension return volatility when investing in high-risk assets, mostly as it only disclose the actual return off-balance sheet and recognised it when reaching certain thresholds leading to inconsistent reporting for risk and reward (Amir & Benartzi, 1999).

Post-IAS 19R

In response to this reporting behaviour, In June 2011, the International Accounting Standards Board (IASB) published three fundamental changes to the pension accounting standard (IAS 19), including a significant alteration in the recognition, presentation, and disclosure of post-employment benefits. Firstly, there is the immediate recognition of Actuarial

Gains and Losses (AGLs) in the Other Comprehensive Income (OCI) to represent the Defined Benefit (DB) plan funding status (OCI effect). Secondly, there is immediate recognition for the determination of net pension cost, which is reflected in the current period's reported income (ERR effect). Finally, an additional disclosure requirement involves providing estimates for future mortality rates, staff turnover, and early retirement.

The determination of pension cost, through the elimination of the corridor approach, is one of the fundamental differences between IAS 19 and IAS 19R. While IAS 19R removes the ERR assumption, the same discount rate is used in determining the Projected Benefit Obligation (PBO) and Plan Assets (PA) that replace the ERR. The net pension cost under IAS 19 is measured as 'ERR * fair value of plan assets minus discount rate * PBO', whereas the net pension cost under IAS 19R is composed of 'discount rate * (PBO - fair value of plan assets)^2'. The ERR on plan assets is determined based on the level of expected reward from risk-taking in asset allocation. However, the ERR depends on asset allocation and includes earnings management, whereas the discount rate reflects the real value of money. This explains the reason for the discount rate being based on the yield of high-quality corporate bonds (AA or higher) of similar maturity to the pension obligation, thus sponsoring firms to become less incentivised to manage earnings to justify their investing behaviour in high-risk assets. This mechanism discourages managers from mitigating the consequences of bearing high risk and high volatility in pension plans by shifting-out equity allocation.

With the introduction of IAS-19R, the opportunity to benefit from high risk was eliminated. Consequently, pension plans post-IAS 19R adoption are thus expected to reflect the cost and benefit of risk-taking, and sponsors are expected to choose an asset allocation strategy that reflects their risk appetite. In other words, the higher the ERR assumption due to

investment in higher-risk assets such as equities, the greater the shift away from equity allocation after removing ERR assumption (Anantharaman & Chuk, 2018; Mashruwala, 2008).

2.2.2 The European pension models

Whilst these countries exhibit differences in their pension systems, they also share some common features that allow them to categorise them into groups. There are multiple approaches to classifying the pension system, but after the Second World War, the four welfare or social model classifications in Europe have gained broader acceptance from academics: Anglo-Saxon, Continental, Mediterranean, and Nordic (Boeri, 2002; Esping-Andersen, 1990; Ferrera, 1998; Sapir, 2006; Sengoku, 2004).

The differences in the social or welfare model represent the social policy models that establish the national public pension systems that influence private pension funds and private pension investment decisions. For example, the Anglo-Saxon model includes Ireland, and the United Kingdom (UK), where the public pension is not large and private pension funds are well developed, particularly the UK pension system is the most distinctive of this model. The Nordic model is represented by Denmark, Finland, the Netherlands, Norway, and Sweden. Despite the disparities amongst the countries under this model, they include statutory minimum basic protection and pensioners receive pension amounts reflecting their historical salary. Initially, the Nordic model offered a small pension amount, but several countries transformed from "Pay As You Earn" to a mixed pension system by setting up defined contribution pension plans, such as Sweden. This reform gave rise to the uneven development of the private pension system, which became an important saving vehicle in some countries, such as the Netherlands. The continental model includes Austria, Belgium, France, and Germany. This model is a hybrid or a mix of the Anglo-Saxon and Nordic model characteristics, featured by high spending on

social support and larger public pension systems and characterised by small private pension investment. The Mediterranean model includes Spain and Portugal, which offers high social support but are characterised by lower wealth distribution, high unemployment, and poverty level. Additionally, the state pension is generous (Sapir, 2006), resulting in the private pension system being behind other countries. Therefore, a noticeable development in the private pension system due to doubts about the viability of the public pension system.

2.2.3 The real effect of IAS 19R reform on assets allocation decisions.

Examining the real effects of changes in accounting standards of pension accounting, and a firm's pension investment strategies extend across two streams of literature. First, the real effects of accounting regulation on corporate decisions (Leuz & Wysocki, 2016; Manski, 1993; Roychowdhury et al., 2019). Second, the determinants of pension investment strategies and pension plan allocations (Amir & Benartzi, 1998; Anantharaman & Chuk, 2018; Barthelme et al., 2019).

The introduction or changes in the accounting standards could have implications on firms' decisions and may influence firms' cash flows which may give rise to changes in how firms operate. This behaviour can be said to be a "real effect" of changes in accounting standards (Napier & Stadler, 2020). In the real effect literature, previous studies have shown that firms use flexibility in accounting standards to manipulate reported earnings. Changes in these standards can result in changes in the operating decisions – especially when managers use accounting standards to achieve specific outcomes, such as maximising incentives (Bergstresser et al., 2006; Cheng & Warfield, 2005), improving market valuation (Charitou et al., 2011), increasing share price (Bansal et al., 2021), or avoiding negative consequences, such as technical default on debt covenants (Jha, 2013).

Defined benefit pension plans are a significant item in a firm's financial statement and may have implications for the capital market (Bergstresser et al., 2006; Jin et al., 2006). This suggests that changes in pension accounting could significantly impact firms' decisions (i.e., real effects). For example, Almaghrabi et al. (2020) show that changes in pension accounting requirements regarding disclosure influence the cost of debt and firms' access to capital. Kim & Nam (2021) document that the adoption of Statements of Financial Accounting Standards (SFAS) 158 enhances investors' valuation and results in mitigating the mispricing of pension funding. Furthermore, Kimyagarov & Shivdasani (2013) argue that firms should terminate or freeze pension plans to overcome the underfunding pension plans.

In the determinants of allocation of plan assets literature, previous studies point out that the investment decision for the allocations of pension plans is subject to several factors. These include the demographics of employees (Rauh, 2009), taxation (Tepper, 1981), corporate financial policies (Bartram, 2018), corporate governance mechanisms (Li & Al-Najjar, 2021; Phan & Hegde, 2013), risk appetite (Rauh, 2009), and accounting standards (Kiosse & Peasnell, 2009).

Several studies examine the real effects of changes in pension accounting on the allocations of pension plans. For example, Amir & Benartzi (1998) examine the impact of SFAS No.87 and found a weak correlation between the use of ERR assumptions and equity investment in pension plans. However, Amir et al. (2010) find that firms change their pension investment strategies after changes in the pension accounting standards in both the UK and the US. Similarly, Mashruwala (2008) document a decrease in the equity allocation post Financial Reporting Standards (FRS) 17 adoptions, suggesting that changes in the accounting standards may influence the allocation of pension investment strategies.

Recently, the IAS 19R removed the ERR assumption from calculating the expected future return on the plan assets. Managers often use this assumption to manipulate earnings to boost net income, and the elimination of this assumption may discourage managers from allocating more plan assets to equity investments (Gold, 2005) – especially if they have to rationalise the use of a higher expected rate of return. Anantharaman & Chuk (2018) examine the impact of removing the ERR assumption on equity allocation and find that, on average, Canadian firms reduce equity allocation post-IAS 19R, relative to both pre-IAS19 and the control group. These results suggest that sponsoring firms manipulate the reported earnings and use the ERR assumption as a mechanism to influence their performance. However, Barthelme et al. (2019) find that eliminating the ERR assumption has an insignificant impact on the DB pension plan allocation, whereas firms shift out fixed-income securities, such as bonds. The ambiguity in the findings can be explained by various factors, including differences in the funding requirements between Canada and Germany. Moreover, the higher spread between the ERR assumptions and the discount rate in Canadian firms may partially explain the greater impact of ERR assumptions in Canadian firms (Barthelme et al., 2019). Barthelme et al. (2019) discussed further underlying reasons that could explain the deviation in the ERR effect between the Canadian and German context including different sample compositions, research design, matching procedures, and control samples.

2.3 Theoretical Framework and Hypotheses Development

2.3.1 Theoretical framework

The theoretical foundations of changes in the accounting standards, in particular the pension accounting regulation IAS 19R, predominantly stems from agency theory. Agency theory assumes a conflict of interest between principles and agents, the self-interests of each party, and an information asymmetry gap between these parties due to the lack of goal

congruence, and different risk appetites (Jensen & Meckling, 1976). Therefore, managers may use the flexibility provided by accounting standards to manipulate reported earnings to meet their personal goals and objectives rather than those of their shareholders. In this case, manipulation can be practised by firms through earnings management of reported earnings from pension plans through the use of a more opportunistic expected rate of return. Consequently, changes in accounting standards can affect potential conflicts of interest between managers and shareholders. Thus, the elimination of the ERR assumption - the mechanism that managers use to manipulate the reported earnings, could indicate a higher transparency for the future expected income.

Positive accounting theory (Watts & Zimmerman, 1986) assume that managers manipulate earnings to achieve certain outcome such as a particular level of earnings growth. In addition, managers hold a level of discretion in their use of accounting methods, which can exploit to manipulate earnings. In this case, managers may alter their decision to take advantage of or avoid the negative consequences of the current flexibility in the accounting regulations. This manager uses flexibility in the accounting regulation to manipulate reported earnings by using a higher expected rate of return. This suggests that changes in pension accounting standards restrict earnings management by eliminating the ERR mechanism, and therefore, managers will have less discretion in managing earnings.

In sum, agency theory suggests that managers utilise flexibility in the accounting standards to achieve their targets rather than shareholders capitalising on the advantage provided by the flexibility of the accounting standards.

2.3.2 Hypotheses development

This study employs agency theory which assumes that there is a conflict of interests between principles and agents resulting from different risk appetites (Jensen & Meckling, 1976) to explain the impact of changes in pension accounting standards IAS 19R on the allocation of pension plans. In this regard, firms have the incentive to manipulate reported income by using the flexibility offered by pension accounting standards – especially using their discretion for earnings management (Bergstresser et al., 2006). In turn, the elimination of the ERR assumption may indicate higher transparency of reported income.

Previous studies find evidence for the significant correlation between the ERR assumption and the equity allocation, suggesting that higher ERR assumptions have to be combined with higher equity allocation to rationalise and explain allocating pension plan assets to higher return assets such as equities (Amir & Benartzi, 1998; Bergstresser et al., 2006; Chuk, 2013; Glaum & Giessen, 2009; Mashruwala, 2008). Therefore, if firms report an unbiased estimate of the ERR, then cross-sectional differences in the ERR should reflect cross-sectional differences in the riskiness of the pension portfolio. This implies that plan sponsors with more equity securities should use a higher ERR than sponsors with fewer equity securities.

However, IAS 19R requires firms to use a discount rate instead of the ERR assumptions to measure expected returns on pension plan assets. According to the positive accounting theory (Watts & Zimmerman, 1986), once the reporting benefit of taking a higher risk is removed, it can be predicted that the asset allocation will be determined purely on the cost and benefit of the investment decision. This may reduce sponsors' willingness to take risks in pension plan asset investments (Anantharaman & Chuk, 2018).

Previous literature provides a single country evidence on the impact of changing pension accounting standards and removing the ERR assumption on asset allocation. For example, Anantharaman & Chuk (2018) find significant evidence for the correlation between eliminating the ERR assumption and the equity allocation. Bergstresser et al. (2006) document that managers increase equity investment in pension plans to rationalise the opportunistic choice of the ERR assumption. Moreover, Chuk (2013) finds that firms that use ERR assumption opportunistically increase their investment in high-risk securities. However, Amir & Benartzi (1998) find a weak association between the ERR assumption and the level of equity investment in pension plan assets. In addition, Barthelme et al. (2019) did not find evidence for the impact of removing the ERR assumption on asset allocation, especially in terms of reducing equity allocation, suggesting that variation in findings may be due to the differences in the contextual settings and research design specifications.

This study hence expects that IAS 19R influence the equity allocation and the first hypothesis will be as follows:

H1: *The firm using a higher ERR assumption pre-IAS 19R will re-balance the DB pension plan investment from high-risk assets post-IAS 19R.*

Furthermore, it can be argued that the impact of removing the ERR mechanism, as predicted under H1, will vary depending on the firms' financial health position, in particular those in financial distress. Financial distress occurs when a firm's total assets are less than its total claims to creditors (Chen et al., 1995) which can happen at any stage of a firm's life cycle and may lead to bankruptcy (Fan et al., 2013). Financial performance impacts managers' decisions and business processes, particularly in financially distressed firms (Iatridis & Kadorinis, 2009), which can be reflected in investment decisions to control firm risk and

balance sheet items volatility. For instance, firms may manage leverage which may determine the firm's risk-taking behaviour.

In light of pension accounting, previous research suggests that highly leveraged firms are risk averse (Rauh, 2009) and more likely to reduce investment in high-risk assets, such as equities, to avoid negative consequences such as debt covenants (Amir et al., 2010). As pension obligations are considered an integral part of corporate debt (Bodie et al., 1985; Martin & Henderson, 1983), equity risk does reflect the risk of a firm's pension (Jin et al., 2006). Evidence shows that plan sponsors in weak financial conditions reduce allocation to riskier asset classes, such as equities, which is consistent with risk management behaviour (Amir & Benartzi, 1999; Petersen, 1996; Rauh, 2009). Therefore, firms in financial distress adopt risk management strategies in pension plan investment by investing in low-risk assets such as fixed-income securities prior to changes in the accounting standards and eliminating ERR assumptions. This suggests that changes in the accounting standards may not have a significant impact on allocating pension plan assets from equities.

However, previous studies have found evidence that allocation to high-risk assets increases when firms are not only near financial distress but also have a low funding ratio. This suggests that firms adopt risk-shifting strategies (Anantharaman & Lee, 2014; Bodie et al., 1985) since sponsoring firms consider risk-shifting as a primary driver for risk-taking. If risk-shifting strategies drive pension policy, it can be predicted that firms in financial distress would invest pension plans in high-risk assets such as equities. Therefore, the elimination of the ERR assumption is not expected to disincentivise managers from taking higher risks and facing more volatility arising from equity investment without boosting earnings (Adams et al., 2011).

Based on theoretical and empirical evidence, the optimal pension risk, and the risk-taking behaviour in plan assets investment for firms in financial distress are inconclusive and provide mixed results. Moreover, institutional differences play an important role in the dissimilarities of risk-taking behaviours (Cocco & Volpin, 2007; Guan & Lui, 2016; Rauh, 2009), with pension regulators in some jurisdictions allowing pension trustees more freedom to take risks in pension plans (Guan & Lui, 2016).

Hence, this study expects that firm's financial distress influences the association between changes in pension accounting reform and risk-taking behaviour post-IAS 19R, however, due to the mixed results, the second non-directional hypothesis will be as follows:

H2: *There is a significant impact of a firm's financial distress on the association between IAS 19R adoption and allocation of pension plan assets.*

2.4 Research Design

2.4.1 Data and sample selection

The samples and data revealed were collected from the Thomson Reuters Eikon and Bloomberg databases, and manual collection for DB pension plan data was carried out from financial statements. While IAS 19R was officially published on June 16th, 2011, and became effective in the EC for the fiscal year beginning January 1st, 2013, this study assumes that sponsoring firms would have started reallocating pension plan assets in 2012. This assumption is consistent with previous literature that suggests the choice of the window in the post-IAS 19R period allows sufficient time for plan sponsors to adjust their allocations of pension plans (Agrawal, 2013; Barthelme et al., 2019; Roberts & Whited, 2013; Vu, 2017). Thus, this study is based on balanced panel data focusing on the period from 2009 to 2011 as a pre-adoption period, and 2012 and 2014 as a post-IAS 19R period (Table 2.3).

Table 2.1 illustrates the sample selection procedures by selecting all publicly listed firms in 13 EC stock market indices for the fiscal year 2009 to 2014, then excluding firms that are (1) cross-listed in multiple stock markets in the EC; (2) without DB plan; (3) with insufficient available information on the allocations of pension plans; (4) with insufficient control variables. The analysis yielded "3,030" observations for the treatment vs control samples.

Table 2.1 Sample selection process

	EC Observation	US Observation	Total
Number of publicly listed firms on Bloomberg	697	506	1203
Less:			
Firms cross-listed in multiple stock markets	16	0	16
Firms without a defined benefit plan	208	179	387
Firms with missing pension information	76	0	76
Firms with missing control variables	81	123	204
Number of unique firms	316	189	505
X 6 analysis period (2009-2014)	1896	1134	3030

Note: This table presents the sample selection procedures. The initial treatment (control) sample consists of all firms listed in the European stock market as of December 2014. Firms are excluded for (1) cross-listed in multiple stock markets; (2) without a defined benefit plan; (3) missing pension information; (4) missing control variables. This yielded 316 unique treatment firms and 189 unique control firms. This study analyses for six years yield 3030 firm-year observations.

2.4.2 Selecting the treatment sample

This study explores thirteen EC, and the choice of this setting is motivated by the fact that the EC represent the largest group of countries sharing a similar financial reporting environment (i.e., using IFRS) since the adoption of IFRS in 2005. However, an extensive literature has contributed to the debate on the classification of European countries into different types of welfare regimes (Arcanjo, 2011; Bonoli, 1997; Esping-Andersen, 1990; Ferrera, 1996; Kautto & Kvist, 2002; Kersbergen & Hemerijck, 2012). Thus, this chapter extends the work by Anantharaman & Chuk (2018) and Barthelme et al. (2019) to investigate the effect of changes in IAS 19R within a broader jurisdictional context. It can be argued that the countries'

adopted welfare models are likely to affect the implementation of IAS 19 differently across countries.

2.4.3 Selecting the control sample

Estimating the causal effects of accounting standards has always been challenging due to the unavailability of a control sample or the assignment of control samples is often non-random, which may give rise to selection bias (Starks et al., 2009). The control group consists of US firms reporting under SFAS 158 and having sponsored DB plans[1] since 2006, so firms would be less likely to make significant accounting adjustments in the allocations of pension plans.

Selection bias is one of the major problems in observational research, mostly due to the treatment and control groups having different characteristics (Starks et al., 2009). There are several common matching approaches, such as Propensity Score Matching (PSM) and entropy score matching. PSM is one of the most popular matching techniques, although there are still some caveats to using the PSM methodology. The PSM approach can only match observable characteristics, whilst a key assumption of using policy shock is the absence of other interventions occurring during the period of interest that could affect the outcome in the treatment group. To overcome the limitations of PSM matching technique, entropy balancing is used to eliminate differences in observational covariates across treatment and control groups (Hainmueller, 2012) and create a balanced sample by ensuring that a set of covariates is balanced. This balancing condition should be achieved when covariate distributions are equalised across treatment and weighted control groups. Although PSM and entropy balancing

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1 Statement of Financial accounting No 158 " Employers` Accounting for Defined Benefit Pension and other Postretirement plan. This standard is under US GAAP and similar to IAS 19 " Employees Benefits" under IFRS.

both adjust for multiple factors, the latter has two conceptual advantages in how it achieves the balance across covariates (McMullin & Schonberger, 2020). Firstly, entropy balancing ensures that the distribution of higher-order covariates across treated and control samples is nearly identical, whilst PSM does not. Secondly, the PSM focuses on balancing the score instead of balancing the covariates mean. In turn, the increase in covariate balancing increases the plausibility that any difference in outcome is driven by the treatment rather than correlated differences in determinants. Lastly, entropy balancing requires relatively few discretionary choices by researchers compared to propensity score matching. The following model is used to match the treatment and control sample:

$$Equity\%_{it} = \alpha_0 + \alpha_1 Treat_i + \Gamma X + \varepsilon_{it} \quad (1)$$

After the balancing conditions have been met, the *Equity%* is tested by estimating the difference between the Equity% of the treated sample and the weighted control sample using Equation (1). The treated sample is given a weight of one, whilst the control sample is assigned a weight determined by the entropy algorithm.

2.4.4 Multivariate analysis

This section explains the empirical model used to examine the causal effect of IAS 19R on the firms` allocations of pension plans and extends the analysis by investigating the moderating effects of financial distress on pension allocation decisions using OLS.

2.4.4.1 Hypothesis 1: Modelling the allocations of pension plans in the EC

This study follows previous studies using the DID approach to measure the impact of change in accounting policies (Agrawal, 2013; Anantharaman & Chuk, 2018; Barthelme et al., 2019; Vu, 2017). The effect of IAS 19R adoption on asset allocation is measured by matching

the treatment sample (i.e., EC firms) with the control sample (i.e., U.S. firms) across IAS 19R adoption pre-period and post-period using DID specification.

H1 predicts that when firms adopt IAS 19R, they are more likely to reduce their investment in equities to reduce pension risks and volatility in the balance sheet and income statement due to the elimination of the corridor approach and mandate for immediate recognition of actuarial gains and losses in the other comprehensive income. In particular, treated firms are expected to reduce investment in equity instruments compared to firms in the control sample in the post-period relative to pre-periods. Using the DID approach, the following equation, using OLS, is employed to examine H1:

$$Equity\%_{it} = \alpha_0 + \alpha_1 Post_{it} + \alpha_2 EC_{it} + \alpha_3 PostxEC_{it} + \alpha_4 \sum Controls + \varepsilon_{it} \qquad (2)$$

Post is a dummy variable that is equal to 1 during the post-adoption period, and 0 otherwise. *EC* is a dummy variable that is equal to 1 for EC firms, and 0 otherwise. To examine changes in pension plan allocations across the treatment and control sample during the pre-period and post-period, an interaction term *PostxEC* is used to capture this change. Specifically, this term captures the difference between treatment and control firms during the pre-adoption and post-adoption periods.

2.4.4.2 Hypothesis 2: Modelling the allocations of pension plans in the EC: The role of financial distress.

H2 predicted that a firm's financial distress moderates the association between IAS 19R adoption and pension investment decisions. To empirically test this prediction, Equation (2) is extended by including an interaction between financial distress and *PostxEC*, yielding the following equation:

$$Equity\%_{it} = \alpha_0 + \alpha_1 Post_{it} + \alpha_2 EC_{it} + \alpha_3\, PostxECxFD_{it} + \alpha_4 \sum Controls + \varepsilon_{it} \quad (3)$$

where *FD* is to capture firms' financial distress, this study employs Altman's (1968) model to measure the firm's financial distress[2]. The following equation is used to measure the distress score:

$$Z - Score_{it} = 1.2\ x\ A + 1.4\ x\ B - 3.3\ x\ C - 0.6\ x\ D + 1.0x\ E \quad (4)$$

where :
A = Working capital / Total assets
B = Retained earnings / Total assets
C = Earnings before interest and tax / Total assets
D = market value of capital equity / Total liabilities
E = Revenue / Total assets

2.4.5 Control variables

The dependent variable *Equity%* represents the percentage of pension plan assets invested in equity securities. Several control variables are used *(i.e., variables definitions and measurements in* Table 2.2*)* to capture firm-specific characteristics, and plan and sponsor characteristics on pension allocation. For example, managers of pension plans with younger (older) beneficiaries would have incentives to invest in equity (fixed-income securities) to hedge future salary escalation (Rauh, 2009). Hence, a positive relationship is expected between pension plan horizon (*Horizon*) and equity allocation. The exposure (*EXP*) of a firm's book value of shareholders' equity to the size of pension plan assets, may also influence the impact of changes in accounting regulation on the allocation of pension plan assets (Barthelme et al., 2019).

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[2] Credit rating may reflect the level of uncertainty about firms' financial performance and stability. Previous studies find that a positive association between credit rating decision and risk-taking reflect the firms' financial stability (Koerniadi, 2021). This study employs credit rating as an alternative measure of financial distress collected from Thomson Reuter Eikon. This study use credit rating as an alternative measurement of financial distress as a robustness test, see Table 2.6, Panel C. The inferences remain unchanged.

The funding level (*Funding*) is an indication of the level of equity investments. Harrison and Sharpe (1986) argue that firms with low funding levels should invest more in equities. On the other hand, Rauh (2009) and Anantharaman and Lee (2014) find that firms with higher funding levels have more investment in equities. Bader (1991) and Amir & Benartzi (1999) discuss the impact of funding levels on the volatilities of future pension contributions suggesting that contribution is predictable in sponsors with moderate contributions yet less predictable in extreme contribution levels, and argue that moderately funded plans should invest in equities, whilst extremely funded plans should allocate assets to fixed-income securities to reduce contribution volatility. This argument concludes that the relationship between funding level and investment in equities is non-linear (an inverted U-shape).

One of the options under the original IAS 19 allowed firms to disclose actuarial gains and losses (AGL) in the notes to the financial statements (off-balance sheet) and amortise them to the income statement when the AGL exceeds a corridor threshold. IAS 19R mandates immediate recognition of AGL (on-balance sheet). These changes in the recognition requirements could motivate firms to de-risk pension investment strategies towards fixed-income securities to mitigate volatility in funding status. The dummy variable *(Corridor)* is incorporated, which is equal to 1 to identify firms that adopt the corridor approach in the IAS 19R pre-period, 0 otherwise.

The deviation between ERR assumption and the discount rate assumption (ERR_DR) has been included to capture whether this deviation motivates managers to take higher risks in pension plans (Chircop & Kiosse, 2015). Anantharaman & Chuk (2018) find that Canadian sponsors shift out of equity allocation when ERR_DR is higher. In contrast, Barthelme et al. (2019) point out that the ERR_DR in German firms is lower relative to Canadian firms,

suggesting that the expected ERR-induced earning impact of IAS 19R is larger for Canadian firms and the finding for ERR effect on equity allocation cannot be generalised.

In terms of sponsor-level characteristics, firm size (*Size*) is included to capture sponsors' size effect as large firms tend to have more investment opportunities and thus have lower operating risk. In addition, firms with high volatility in operating cash flow invest in bonds to offset corporate risk. This reflects that firms may avoid contributions to pension plans due to a shortage in operating cash flow *(STDCF*). Therefore, the volatility of operating cash flow is expected to be negatively associated with equity allocation.

The model includes variables *(i.e., variables definitions and measurements in* Table 2.2*)* to capture funding arrangements across debt covenants and dividend payments. Firms have similar motives to avoid violating debt covenants or reserve cash flow to pay annual dividends, motivating controls for both the debt covenants *(Lev)* and dividends paid to shareholders *(Dividends).* Sponsors with tight debt covenants and higher dividend pay-outs are expected to invest in bonds. Therefore, pay-out dividends (*Dividend*) and financial leverage (*Lev*) are expected to be negatively associated with pension allocation to equity (*Equity%*). Firms with a large percentage of shareholders are more effectively monitored against executives' compensation-related incentives to risk-taking behaviour in pension investment strategy (Anantharaman & Lee, 2014). Following Barthelme et al. (2019), the Free Float percentage *(FF)* is included to capture the size of block holders.

Table 2.2 Variable descriptions

Variable	**Descriptions**	**Source**
EC	Dummy variable is equal to 1 if the firms in listed in any of the EC stock markets, and 0 Otherwise.	N.A.
Post	Dummy variable is equal to 1 for the post-IAS 19R period, and 0 otherwise.	N.A.
Equity%	Equity investment in pension plans to total pension plans.	Bloomberg
Debt%	Debt investment in pension plans to total pension plans.	Bloomberg

Private Equities %	Private Equity investment in pension plans to total pension plans.	Bloomberg
HF%	Hedge Fund investment in pension plans to total pension plans.	Bloomberg
Cash%	Cash investment in pension plans to total pension plans.	Bloomberg
Alternative%	Alternative investment in pension plans to total pension plans.	Bloomberg
RE%	Real Estate Investment in pension plans to total pension plans.	Bloomberg
Others%	Other investments in pension plans to total pension plans.	Bloomberg
Control Variables		
Horizon	The natural log of the ratio PBO to the current service cost.	Bloomberg & Thomson Reuters
Exposure	Pension plan assets are divided by the book value of shareholders` equity. The negative book value amount was replaced by TA-S & Long-term debt.	Bloomberg & Thomson Reuters
Funding	The fair value of pension plans is divided by the projected benefit obligation.	Bloomberg & Thomson Reuters
Corridor	If the company applies the corridor approach =1, 0 otherwise.	Manual collection from Annual reports
ERR_DR	The difference between the ERR and the discount rate.	Bloomberg & Thomson Reuters
Size	The natural log of market capitalisation.	Bloomberg & Thomson Reuters
STDCF	The standard deviation of the operating cash flow to book value of equity for the last five years	Bloomberg & Thomson Reuters
Leverage	Long-term debt is divided by the sum of long-term debt and market capitalisation.	Bloomberg & Thomson Reuters
Dividends	The dividends pay-out ratio is dividends paid divided by net income.	Bloomberg & Thomson Reuters
FF	Percentage of free-floating.	Bloomberg & Thomson Reuters
Macroeconomic variables		
Investor Protection	Strength of investor protection ranked 0-10 (best)	World Bank
Regulation Qual. Rank	Perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development, 0-100% (best)	World Bank
Legal system	Countries follow common law =1, whilst civil law =0	World Legal Systems, Website of the Faculty of Law of the University of Ottawa
Control of Corruption	Perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.	World Bank
Corporate governance variables		
Board Size	Number of directors on a board	Bloomberg
Boarding Meet %	Percentage of director attendance to board meetings.	Bloomberg

Independent Director%	Percentage of independent directors to the board size	Bloomberg
Women%	Percentage of women directors on the board	Bloomberg
Audit committee independent director%	Percentage of independent directors to the audit committee size.	Bloomberg
Audit committee attendance	Percentage of director attendance to audit committee meetings.	Bloomberg
Audit committee Size	Number of directors in the audit committee	Bloomberg

2.5 Results

2.5.1 Descriptive statistics

In Table 2.3, Panel A and B present the observation at country level and industry level showing that the UK and the Industrials sector have the largest percentage by 50.32% and 28%, respectively. In Table 2.3, Panel C, the pension investment in equities in 2014 is 29.34% on average. There is a remarkable pension investment in equities in the United Kingdom and Ireland, having more than 39% and 37%, respectively. The funding rations for the Netherlands are the highest at 91.14%. Sponsors in Finland, Belgium, Spain, Sweden, and Denmark also invest an important weight of their pension plans in equities (35.08%, 33.88%, 32.59%, 31.90%, and 30.57%). The fair value of the plan assets (FVPA) for the top countries with significant pension plan assets are as follows: the United Kingdom at USD 2.56 million, Germany at USD 0.970 million, and Sweden at USD 0.872 million.

Table 2.3 Total Observation

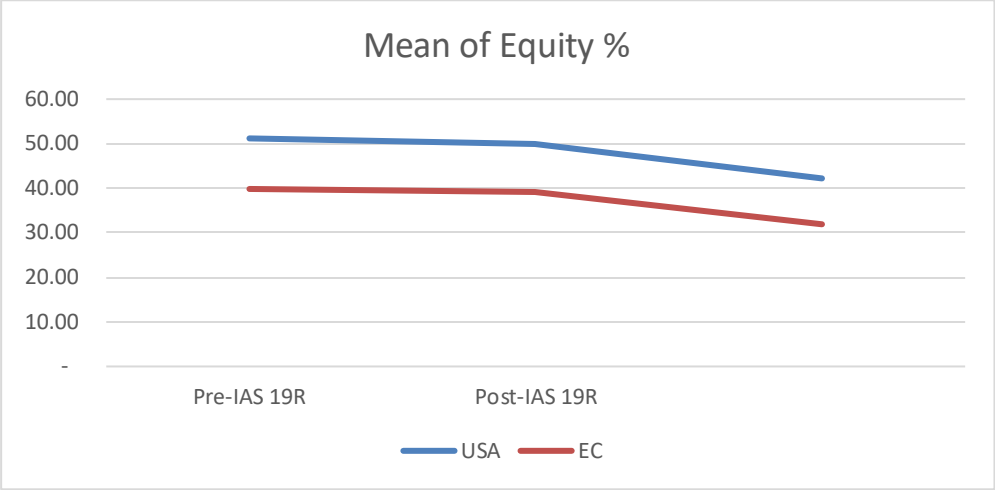
Panel A: Total observations by country and year								
Country	2009	2010	2011	2012	2013	2014	Total	Total%
Ireland	11	11	11	11	11	11	66	3.48%
UK	159	159	159	159	159	159	954	50.32%
Austria	7	7	7	7	7	7	42	2.22%
Belgium	5	5	5	5	5	5	30	1.58%
France	22	22	22	22	22	22	132	6.96%
Germany	21	21	21	21	21	21	126	6.65%
Portugal	6	6	6	6	6	6	36	1.90%
Spain	5	5	5	5	5	5	30	1.58%
Denmark	9	9	9	9	9	9	54	2.85%
Finland	16	16	16	16	16	16	96	5.06%
Netherland	9	9	9	9	9	9	54	2.85%

Norway	34	34	34	34	34	34	204	10.76%
Sweden	12	12	12	12	12	12	72	3.80%
Total	**316**	**316**	**316**	**316**	**316**	**316**	**1896**	**100.00%**
Panel B: Total observations by industry and year								
Industry	2009	2010	2011	2012	2013	2014	Total	Total%
Basic Materials	36	36	36	36	36	36	216	11%
Consumer Cyclicals	49	49	49	49	49	49	294	16%
Consumer Non-Cyclicals	37	37	37	37	37	37	222	12%
Energy	20	20	20	20	20	20	120	6%
Financials	11	11	11	11	11	11	66	3%
Healthcare	16	16	16	16	16	16	96	5%
Industrials	89	89	89	89	89	89	534	28%
Real Estate	8	8	8	8	8	8	48	3%
Technology	33	33	33	33	33	33	198	10%
Utilities	17	17	17	17	17	17	102	5%
Grand Total	**316**	**316**	**316**	**316**	**316**	**316**	**1896**	**100%**
Panel C: Pension plan by the country for 2014								
	FV of PA (USD)				Equity%			Funding Ratio
Ireland	20,546.47				39.70%			74.92%
UK	2,561,972.96				37.35%			88.96%
Austria	5,978.51				24.36%			51.63%
Belgium	47,940.48				33.88%			58.92%
France	270,370.71				28.02%			66.04%
Germany	872,524.34				24.05%			65.57%
Portugal	14,866.31				21.44%			80.60%
Spain	18,784.41				32.59%			62.26%
Denmark	84,391.22				30.57%			70.68%
Finland	37,398.70				35.08%			79.85%
Netherland	335,176.68				28.35%			93.14%
Norway	418,309.36				14.17%			79.96%
Sweden	970,680.90				31.90%			76.78%
Average	**435,303.16**				**29.34%**			**73.60%**

Table 2.4 presents descriptive statistics for all variables used in the model for the full sample, providing statistical insights into the control variables for treatment and control samples. In Panel A, the allocations of pension plans to equities for treatment firms show an average reduction from 49.1% to 40.3% (18% reduction) across pre-treatment and post-treatment periods. In Panel B, the control sample shows a fairly stable asset allocation to equities (*Equity%*) from 42.5% to 38.4% (9.5% reduction) (also see Figure 2.1). Panels C and D show descriptive statistics of pension fund characteristics, such as funding ratio (*Funding*), horizon (*Horizon*), and adoption of corridor approach (*Corridor*), for each country in the

sample. Although these figures reveal a range of values at the firm level, the underlying policies and regulations are predetermined at country level.

Figure 2.1 Mean of %Equities for European and US firms



The figure at the top depicts a graphical representation of the change in mean values of %Equities between the pre-and post-19R period for European (treatment) and the US (control) firms.

Table 2.5 presents Pearson correlations between the main variables of interest in the empirical analysis, with Panel A representing EC firms and Panel B representing US firms. The expected investment behaviour of firms with longer horizons is to invest in more equities for both EC and US firms. However, EC firms with regular dividend pay-out tend to invest in fewer equities. In contrast, better-funded smaller firms with high leverage tend to invest more equities in the EC. In the US sample, plans with a higher gap between the ERR and discount rate tend to invest more in equities; despite the ERR manipulation, ERR assumption remains a determinant of the allocation of pension plans. In both samples, plans with higher floating rates invest higher equities. The correlation between control variables is low, suggesting no multicollinearity issue amongst variables, with variance inflation factors below 2 in the main analysis.

Table 2.4 Descriptive Statistics

	Pre-period					Post-period				
Variable	Mean	S.D.	Min	Median	Max	Mean	S.D.	Min	Median	Max
Panel A: Treatment Sample - EC countries										
Equity%	49.090	18.350	0.000	49.660	98.330	40.280	20.060	0.000	38.740	98.890
Horizon	3.990	0.800	1.540	4.010	6.700	4.190	0.960	1.000	4.100	8.100
Exposure	25.120	175.270	0.000	0.270	1991.370	20.280	124.630	0.000	0.290	1232.080
Funding	78.330	20.650	0.000	79.210	184.990	77.860	19.800	0.000	82.390	119.180
Corridor	0.300	0.460	0.000	0.000	1.000	0.310	0.460	0.000	0.000	1.000
ERR	6.420	2.520	0.000	6.620	17.800	6.100	1.990	0.000	6.300	13.000
DR	5.420	1.190	0.000	5.500	11.480	4.180	1.140	0.000	4.300	7.900
ERR_DR	1.000	2.510	-6.400	1.200	11.500	1.920	2.010	-5.050	2.000	7.860
Size	8.420	2.040	3.080	8.550	13.040	8.660	2.020	2.890	8.820	13.440
STDCF	0.070	0.350	0.000	0.030	5.840	0.060	0.230	0.000	0.030	3.650
Leverage	28.550	30.940	0.000	15.800	99.750	28.110	30.720	0.000	15.100	99.390
Dividend	0.540	0.990	0.000	0.380	14.790	0.620	1.020	0.000	0.420	11.640
FF	0.850	0.180	0.290	0.940	1.000	0.840	0.200	0.190	0.930	1.000
Panel B: Control Sample - USA										
Equity%	42.460	15.110	0.000	43.000	70.000	38.400	16.470	0.000	39.000	71.250
Horizon	4.070	1.020	0.260	3.940	7.760	4.250	1.010	1.640	4.100	8.140
Exposure	0.400	0.670	0.000	0.180	7.800	0.510	0.890	0.000	0.240	7.930
Funding	77.870	15.420	34.520	77.610	162.270	80.310	16.360	32.850	81.840	149.600
Corridor	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ERR	6.770	2.380	0.000	7.370	15.630	6.330	2.000	0.000	6.700	13.990
DR	5.410	0.860	0.000	5.500	10.500	4.260	0.790	1.400	4.200	8.100
ERR_DR	1.360	2.360	-7.380	1.900	10.170	2.070	2.040	-6.150	2.500	10.240
Size	9.590	1.170	7.110	9.500	12.690	9.850	1.040	7.780	9.720	13.000
STDCF	0.090	0.110	0.000	0.060	0.810	0.080	0.260	0.000	0.050	4.120
Leverage	0.340	0.200	0.000	0.330	0.880	0.390	0.200	0.000	0.360	1.750
Dividend	18.230	36.450	0.040	7.530	318.320	15.810	31.520	0.090	5.740	255.580
FF	0.960	0.090	0.360	0.990	1.000	0.960	0.070	0.430	0.990	1.000

Panel C: Descriptive statistics across countries

	Equity%		Horizon		Exposure		Funding		Corridor		ERR_DR	
Countries	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Ireland	47.873	53.333	4.393	4.258	1.091	0.400	88.438	86.232	0.182	0.000	-0.771	0.000
UK	43.611	43.460	4.636	4.465	13.121	0.485	87.969	88.335	0.107	0.000	-0.888	0.050
Austria	23.033	23.947	4.540	4.433	0.250	0.045	51.288	53.947	0.714	1.000	-1.377	-0.500
Belgium	34.997	40.500	3.636	3.432	0.542	0.100	55.476	57.687	0.400	0.000	0.504	0.980
France	30.758	30.000	3.635	3.635	0.382	0.090	56.524	56.927	0.636	1.000	0.490	0.800
Germany	26.499	25.971	3.962	3.996	0.983	0.435	62.111	69.236	0.333	0.000	0.823	0.600
Portugal	26.027	20.400	4.597	4.560	0.308	0.050	81.896	86.432	0.167	0.000	0.226	0.265
Spain	35.694	29.000	4.749	4.706	0.082	0.040	78.568	57.909	0.800	1.000	-0.644	-0.220
Denmark	36.873	36.002	3.668	4.041	0.402	0.025	68.121	68.896	0.222	0.000	0.602	0.610
Finland	33.371	31.900	4.000	3.913	0.396	0.115	77.367	77.074	0.813	1.000	0.521	0.200
Netherland	29.360	29.642	4.087	4.397	2.284	1.140	85.058	88.139	0.778	1.000	0.945	0.900
Norway	15.614	12.000	2.925	2.941	4.644	0.035	112.353	69.574	0.794	1.000	1.043	1.200
Sweden	34.723	36.131	3.718	3.729	0.811	0.415	113.826	76.884	0.917	1.000	1.205	1.175
United States	46.692	48.000	4.054	3.914	0.580	0.310	79.292	79.055	0.000	0.000	2.348	2.600

Panel D: Descriptive statistics across countries (continuous)

	Size		STDCF		Leverage		Dividend		FF	
Countries	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Ireland	6.741	6.960	0.039	0.025	30.698	18.599	1.114	0.226	0.731	0.800
UK	7.470	7.270	0.047	0.033	32.383	18.237	0.587	0.408	0.884	0.961
Austria	7.507	7.456	0.039	0.031	33.915	25.033	0.568	0.381	0.616	0.691
Belgium	9.314	8.994	0.031	0.025	29.066	19.262	0.855	0.689	0.599	0.530
France	9.763	9.725	0.030	0.018	24.215	19.151	0.568	0.404	0.691	0.724
Germany	10.068	10.249	0.031	0.024	31.475	20.881	0.587	0.357	0.844	0.911
Portugal	7.986	7.740	0.070	0.045	46.470	53.451	0.786	0.706	0.394	0.399
Spain	9.343	9.529	0.029	0.031	47.867	37.382	0.870	0.718	0.420	0.420
Denmark	10.570	10.242	0.049	0.037	13.181	1.655	0.273	0.241	0.773	0.885
Finland	7.801	7.768	0.046	0.038	27.634	24.962	1.088	0.750	0.638	0.646
Netherland	9.072	9.266	0.035	0.029	26.942	17.991	0.628	0.429	0.809	0.894
Norway	8.489	8.551	0.115	0.070	28.786	11.533	1.140	0.314	0.475	0.472
Sweden	11.542	11.526	0.035	0.032	19.356	9.050	0.696	0.556	0.905	0.968

United States	9.734	9.666	0.206	0.056	0.407	0.390	13.805	5.709	0.963	0.992

Note: This table provides descriptive statistics for the variables used in the main analyses.
Panel A and Panel B provide descriptive statistics for variables of interest for treatment firms and control firms across pre-period and post-period.
Panel C and Panel D provide descriptive statistics for variables of interest across countries.
All variable definitions are presented in Table 2.2
All continuous variables are winsorised to 1 and 99 percentiles levels to mitigate potential bias associated with outliers.
*, ** and *** indicate significance at the 10%, 5%, and 1% levels.

Table 2.5 Correlations Matrix

Panel A: EC

Variables	Equity%	Horizon	Exposure	Funding	Corridor	ERR_DR	Size	STDCF	Leverage	Dividend	FF
Equity%	1.00										
Horizon	0.16*	1.00									
Exposure	0.03	0.01	1.00								
Funding	0.17*	0.28*	0.07*	1.00							
Corridor	-0.24*	-0.22*	0.12*	-0.22*	1.00						
ERR_DR	-0.05	0.10*	0.08*	0.02	-0.01	1.00					
Size	-0.31*	-0.14*	0.19*	-0.24*	0.15*	0.19*	1.00				
STDCF	-0.05	0.07*	-0.02	0.02	-0.02	-0.03	-0.09*	1.00			
Leverage	0.13*	0.08*	-0.13*	0.04	-0.06	-0.17*	-0.41*	0.08*	1.00		
Dividend	-0.07*	-0.05	-0.03	-0.04	0.13*	0.01	0.010	-0.01	0.17*	1.00	
FF	0.13*	-0.01	0.09*	0.24*	-0.20*	-0.07*	-0.05	0.02	-0.07*	-0.07	1.00

Panel B: USA

Variables	Equity%	Horizon	Exposure	Funding	ERR_DR	Size	STDCF	Leverage	Dividend	FF
Equity%	1.00									
Horizon	0.09*	1.00								
Exposure	-0.01	0.19*	1.00							
Funding	0.03	0.05	0.12*	1.00						
ERR_DR	0.07*	0.04	0.10*	0.08*	1.000					
Size	-0.05	-0.18*	0.14*	0.10*	0.040	1.00				
STDCF	0.05	-0.02	0.31*	0.01	0.040	0.09*	1.00			

Leverage	-0.07*	0.18*	0.37*	0.04	0.28*	-0.11*	0.31*	1.00		
Dividend	0.04	-0.13*	-0.18*	-0.20*	-0.09*	-0.04	0.02	-0.30*	1.00	
FF	0.01	-0.25*	0.02	-0.09*	0.050	0.07*	0.05	0.20*	-0.05	1.00

Note: This table provides a correlation matrix for the treatment and control sample
Panel A provides correlation coefficients for the treatment sample between variables used in the main study in Table 2.2
Panel B provides correlation coefficients for the control sample between variables used in the main study in Table 2.2
All continuous variables are winsorised to 1 and 99 percentiles levels to mitigate potential bias associated with outliers.
*, ** and *** indicate significance at the 10%, 5%, and 1% levels.

2.5.2 Main results

2.5.2.1 Univariate results

Panel A of Table 2.6 presents univariate tests of differences in %Equity between the treatment and control groups as well as over time. Treatment firms exhibit a decline in %Equity by − 4.791; this difference is significant (p-value = 0.000). Control firms' %Equity declines by 4.329; again, this difference is significant (p-value = 0.000). The difference-in-differences of interest, − 4.618, is significant at the 1% level (p-value = 0.000).

2.5.2.2 Multivariate results

This study examines how changes in accounting regulation affect the allocation of equity in DB pension plans. First, the OLS was compared with the random effect model using the Breusch and Pagan Lagrangian multiplier test for random effects to test the accuracy of the random effect model. The results (*the coefficient is 4027.75; and statistically significant with a p-value 0.000*) suggest rejecting the null hypothesis of zero variance across equity allocation (see Appendix 2.1), indicating that the random effects model is a proper estimation model.

Following, the study estimates fixed effects and random effects panel estimators using clustered standard error (conditional on independent variable) within the country dimension to choose the exact model specification. The Hausman test is also adopted to test the correct model (see Appendix 2.2). The Hausman test results (*the coefficient is 268.50; p-value 0.000*) show that the null hypothesis is rejected; hence the fixed effect model is the correct model. The fixed effect estimations outperform random effect estimation and are more appropriate for specific units, such as countries, considering the correlation between the error term and the constant.

2.5.2.3 Hypothesis 1: Modelling the allocations of pension plans in the EC.

Table 2.6 Panel B presents the results of the multivariate analysis for the DID specifications among the EC sample and US sample pre- and post-IAS 19R. Model (1) shows the experimental variable *PostxEC* to test H1, showing a significant negative association (*the coefficient is -4.000, and statistically significant at a 10% level*). The results indicate that the proportion of pension assets invested in equities declined by 4% in the treatment group relative to the control group in post-IAS19. On average, the IAS 19 reform caused a reduction in equity investment for EC firms by an amount equal to 0.22 standard deviation change in the equities investments (4%/18.350%, as per Table 2.4 and Table 2.6 Panel B (1)).

Amongst the control variables, *Funding* shows an insignificant negative association between the funding level and the allocation of pension equities to pension plans, suggesting that mandatory funding disincentivises firms from investing in high-risk assets. While the coefficient for *Funding* is insignificantly negative for the entire sample, it shows statistical significance for individual countries. The overall coefficient varies depending on welfare models and specific countries. For example, in Ireland, the negative effect is statistically significant (*coefficient is -0.370, significant at the 5% level*). In contrast, in France and Denmark, the coefficients is positive (*coefficient is 0.344 and 0.435 and are statistically significant at the 10% and 5% levels, respectively*).

Moreover, the corridor variable (*Corridor*) shows a significant and negative association with equity investment (*the coefficient is -4.029, and statistically significant at a 10% level*), suggesting that the reduction in equity investment is negatively associated with the presence of the corridor mechanism, and abolishing the corridor approach significantly influences the increase of equity investment. While the coefficient of *Corridor* is significantly negative for the entire sample, the coefficient for individual countries is insignificant, and the overall

coefficient for the entire sample varies according to welfare models and individual countries. For instance, while the negative effect is statistically significant in the Nordic welfare model and its underlying countries (i.e., Denmark, Finland, Norway, and Sweden) (*the coefficients are -13.330***, -29.491**, -22.471**, -12.893**, -24.189**, respectively*), the association is significantly positive in Spain (*coefficient is 53.048, statistically significant at a 5% level*). These results suggest that the abolishing of the corridor effect varies across countries according to their welfare system.

In addition, firm size (*Size*) is negative and significant. The other variables, such as *Leverage* and *STDCF* are negative and significant and loaded as expected. The multivariant analysis shows that firms with higher volatility in cash flow and leverage ratio are negatively associated with the allocation of pension plan assets in equities.

The adjusted R^2 of 35% surpasses the findings in prior literature (Anantharaman & Chuk, 2018; Barthelme et al., 2019; Bergstresser et al., 2006; Rauh, 2009) This is aligned with the findings in prior literature that agents opportunistically increase investment in high- risk securities to boost reported income using pension accounting settings. Additionally, the results complement the economic consequences of accounting regulation literature, particularly the economic consequences of IAS 19 on pension asset allocation (Amir et al., 2010; Anantharaman & Chuk, 2018; Barthelme et al., 2019; Chuk, 2013; Glaum & Giessen, 2009; Mashruwala, 2008)

2.5.2.4 Hypothesis 2: Modelling the allocations of pension plans in the EC: The role of financial distress

Table 2.6, Panel B (2) and (3), present results for testing H2, which predicts that a firm's financial distress (*FD*) moderates the impact of IAS 19R on equity allocation (*Equity%*). It shows the results for financial distress measured by Alman's Z-score (*Z-Score*). The main

coefficient of interest in the three-ways interaction *PostxECxFD,* where *FD* is *Z-Score* allows the capture of the incremental changes in *Equity%* post-IAS 19R. The coefficient of *PostxECxZ-Score* is negative and significant (*the corresponding coefficient is -1.363 and is statistically significant at the 5% level*). The results indicate that the proportion of pension assets invested in equities declined by 1.363 points in the treatment group relative to the control group in post-IAS19 in financially distressed firms. On average, the IAS 19 reform caused a reduction in equity investment for financially distressed firms in the EC by an amount equal to 0.25 standard deviation change in the equity's investments (*1.363%/18.350%, as per* Table 2.4 *and* Table 2.6 *Panel B*). In sum, the main analysis to test H2 supports the prediction that financially distressed firms adjust their pension investment strategy and shift out of equity in response to changes in the pension accounting standard (i.e., IAS 19R) and removal of the ERR assumption, supporting the notion that firms in financial distress adopt risk management strategies in pension investment strategies. These results are consistent with prior studies that support risk plan sponsors reduce pension risk by reducing investment when facing weak financial condition (Amir & Benartzi, 1999; Petersen, 1996; Rauh, 2009).

While the overall results are consistent with the risk management assumption that removing ERR assumptions reduces risk-taking behaviour by allocating pension plan assets in less risky assets in financially distressed firms, there is variation at the country level, as observed in countries such as Austria and Spain (Table 2.8). This variability can be attributed to institutional differences, which play a fundamental role in assessing the economic consequences of changes in accounting regulation, such as pension accounting (Cocco & Volpin, 2007; Guan & Lui, 2016; Rauh, 2009) as pension regulators in some jurisdictions allow pension trustees more freedom to take risks in pension plans (Guan & Lui, 2016).

Table 2.6 Matching Treatment and Control Samples using Entropy Matching

Panel A: Univariate analysis

	Pre-treatment		Post-treatment		Difference (post-pre)	
	N	Mean	N	Mean	Change	p-value
Treatment observations	948	38.605	948	33.814	-4.791	0.000***
Control observations	567	48.856	567	44.528	-4.329	0.000***
Difference	1515	42.442	1515	37.824	-4.618	0.000***

Panel B: Multivariate analysis – H1 and H2

	Pred.	(1) H1		(2) H2		(3) H2	
		Original Model		FD=Z-Score		FD=Rating	
		Est.	t-test	Est.	t-test	Est.	t-test
PostxEC	***-***	***-4.000****	***(-1.71)***	***0.711***	***(0.25)***	***3.776***	***(1.22)***
PostxECxFD	***-***			***-1.363****	***(-2.39)***	***-0.150*****	***(-2.67)***
FD				1.331**	(2.33)	0.204***	(3.30)
EC		-5.181	(-0.70)	-1.879	(-0.25)	-4.446	(-0.67)
Post		-3.117	(-1.18)	-2.876	(-1.18)	-1.003	(-0.37)
Horizon	+	-0.517	(-0.51)	-1.378	(-1.30)	-1.171	(-1.30)
Exposure	-	0.022**	(2.24)	0.025**	(2.54)	0.024**	(2.46)
Funding	+	-0.001	(-0.39)	-0.002	(-0.65)	-0.001	(-0.25)
Corridor	+	-4.029*	(-1.69)	-4.428*	(-1.84)	-4.276*	(-1.75)
ERR_DR	+	0.433	(1.30)	0.375	(1.15)	0.075	(0.24)
Size	+	-2.101***	(-2.66)	-2.239***	(-2.92)	-2.282***	(-3.21)
STDCF	-	-15.172*	(-1.69)	-15.886*	(-1.86)	-12.838*	(-1.74)
Leverage	-	-0.065**	(-2.08)	-0.057*	(-1.84)	-0.056*	(-1.77)
Dividend	-	-0.047	(-1.12)	-0.053	(-1.11)	-0.032	(-0.66)
FF	+	-19.053***	(-2.77)	-14.878**	(-2.36)	-16.288***	(-3.06)
_cons		67.981***	(5.63)	63.209***	(5.47)	57.229***	(5.33)
Year FE		Yes		Yes		Yes	
Industry FE		Yes		Yes		Yes	
Country FE		Yes		Yes		Yes	
N		3030		3030		3030	
Adj. R2		0.35		0.37		0.39	

t-tests are in parenthesis. *, ** and *** indicate significance at the 10%, 5%, and 1% levels. Standard errors are clustered by firms. All continuous variables are winsorised to 1 and 99 percentiles levels to mitigate potential bias associated with outliers. All control variables are defined in Table 2.2

2.5.3 Additional analysis

2.5.3.1 Effect of IAS 19R on plan assets allocation to different asset classes.

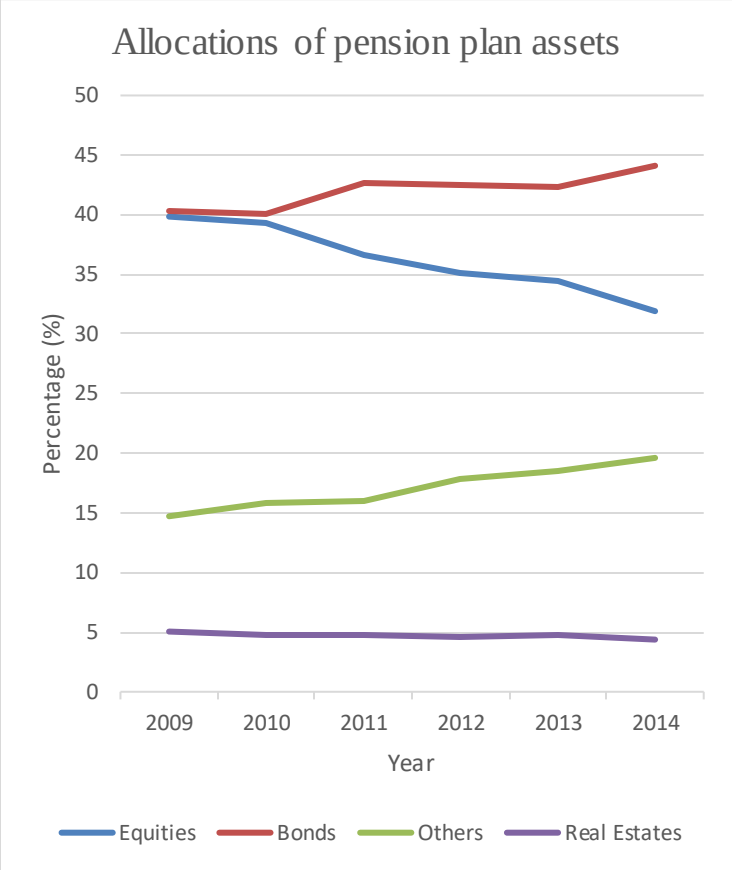
The relative importance of equities and bonds in pension plan allocation varied considerably across countries (OECD, 2021b) (see Appendix 2.3) with emphasis on investing a relative proportion of assets in the *other asset* class. Pension plan allocation across European countries have moved from traditional investment strategies to more diversified plans. In 2014,

the European institutional marketplace overview documented that the average equities and bonds are 34% and 52% respectively (Mercer, 2014, p8) compare to 22% and 54% in 2020 respectively (Mercer, 2020, p7) suggesting a drop in equity investment by nearly 38%. This combined with a growing trend in the investment in *other assets* class such as cash, properties, alternatives, and hedge funds. For example, Mercer (2020, p9) documents a surge in the investment of the o*ther assets* class over the years for UK firms having DB pension plans reaching 27% in 2020 compared to 2% and 6% in 2004 and 2009, respectively (Appendix 2.4). Furthermore, *other assets* groups such as real estate, private investments, and alternative investment account for a relatively small proportion of investment in pension assets, but this proportion is high in some countries, such as 37.10% in Austria, 42.5% in Denmark, and 42.90% in Germany. This variation in investments of *other assets* class has emerged from the institutional differences across jurisdictions, such as investment restrictions in some asset classes such as real estate (OECD, 2021a).

Although, the literature of pension plan allocation primary focus on the two main asset classes (i.e., equity and bods), there is a lack of research on the disaggregation of the opaque asset class (i.e., *other assets*) due to a lack of detailed disclosure (Anantharaman & Chuk, 2017; Barthelme et al., 2019). These asset classes can contain a combination of high-risk assets, such as hedge funds as well as low-risk assets such as cash and loans, and firms can mix their investment between these asset classes to diversify returns. Furthermore, for the purpose of this study, Figure 3 shows increased investment in other assets for the sample period (2009-2014). The percentage of allocation to equities decreases, those to bonds increases, and *other assets* increase. The increase in pension assets invested into *other assets* is consistent with the findings Barthelme et al. (2019). Therefore, this study examines extend the current literature of pension

plan allocation and examine the effect of changes in the pension accounting standard on the *other assets* class.

Figure 2.2 Average allocation of pension plan assets for EC



The figure at the top depicts a graphical representation of the average allocations of pension plan assets for the main asset classes (equities, bonds, real estate and others).

Table 2.7 shows the result of asset allocation to different asset classes using entropy balance matching. In Panel A, the coefficient of *PostxEC* is statistically significant and supports the main analysis for testing H1, suggesting that sponsors shift out of equity allocation post-IAS 19R, but the coefficient of *PostxEC* is positively insignificant for the *other asset*s class. Panel B reports the results at the pension model level. The coefficient of *PostxEC* in the Anglo-Saxon model is significantly negative (positive) for equity and real estate (bonds and hedge funds). Similarly, *PostxEC* coefficient is statistically significant for equity and real estate investment in continental economies at a 10% level. The Mediterranean countries show an

insignificant negative shift in equities investment but show a significant increase in bonds and cash investment (toward more liquid and lower-risk assets). The Nordic countries report a statistically insignificant decline in both equities and bonds but a significant increase in alternative investment (higher-risk assets). At country level, the UK, the Netherlands, and Sweden show a significant decline in their pension investment in equities, while a significant increase in bonds in Ireland and the UK at 10% and 5% levels, respectively. In the Netherlands, the *PostxEU* coefficient is significant and positive with cash investments suggesting that firms re-allocate pension plan assets towards lower-risk assets.

Although the results in Table 2.8, Panel A, show that sponsors facing financial distress in EC reduce pension assets invested in equities, there is a variation across social models and countries. The results in Panel B are insignificant at pension model level. In addition, Panel C shows the results at country level, and on average, Austria shows that firms in financial distress increase pension assets invested in equities by 3.68%. In addition, Spain shows a statistically significant increase in pension assets invested in equities (the *coefficient is 14.89 and statistically significant at 10% level*), coupled with a significant decline in pension assets invested in bonds (the *coefficient is -28.38 and statistically significant at 10% level*). The other economies show an insignificant shift in pension assets invested in equities, but they show variations in the *other assets* class.

2.5.3.2 Pension scheme and country's welfare system

While previous literature suggests that European countries have differences in their social or welfare model, some countries share some features that allow categorising them into groups (Boeri, 2002; Esping-Andersen, 1990; Ferrera, 1998; Sapir, 2006; Sengoku, 2004). These differences in the social or welfare model reflect the established national public pension systems that influence private pension funds, and eventually the private pension investment

decisions (Gough & Adami, 2012). In this regard, it is important to focus on variations in countries' welfare and social policies when assessing the changes in pension accounting standards on their allocation of pension plan assets in order to understand the implications of social system as an influential factor on the changes in accounting regulations.

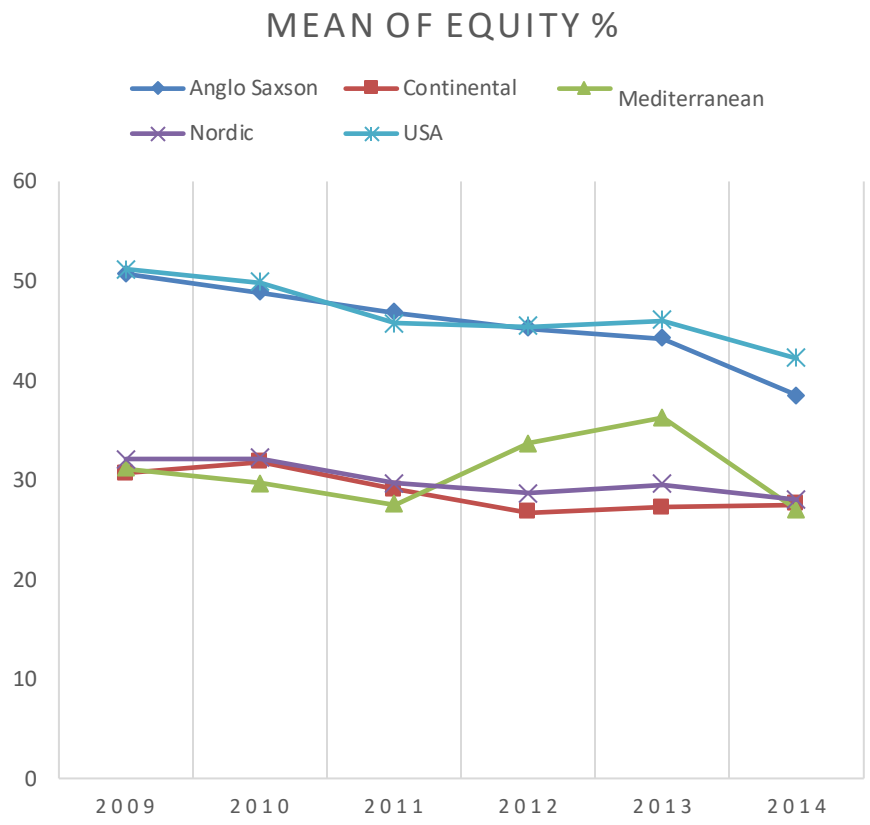
Table 2.7, Panel B, shows changes in equities allocation across welfare models and countries. The results document that introducing changes to the pension accounting standards - especially removing the ERR assumption - results in a significant reduction in the allocation of pension plan assets to equities, particularly in countries that adopt the Anglo-Saxon and continental social model. More specifically, the results show that pension assets invested in equities declined in the Anglo-Saxon model and the Continental model, on average, by 9.31% and 4.31% respectively, compared to the Mediterranean and Nordic models. Panel C presents the results at country level, showing that firms in the UK, the Netherlands, and Sweden reduce pension assets invested in equities by 9.16%, 9.90% and 8.79% respectively.

In general, countries that follow the Anglo-Saxon and Nordic models have a greater pension investment in equities compared to their counterparts in the European economies (see Figure 2.3 and Figure 2.4 Average allocation of pension plan assets based on the welfare system) and funding ratios. In particular, both Ireland and the UK display substantial investments in equities and higher funding ratios. In contrast, Austria, Belgium, France, Germany, Portugal, and Spain show significantly lower funding ratios and equity investments in pension assets. Countries such as Denmark, Finland, the Netherlands, Norway, and Sweden maintain an intermediate position in terms of equity investment but have the highest funding ratios (see Table 2.3, Panel C).

This study also explores how firms' financial distress may influence pension asset allocations under different welfare models and pension systems. Table 2.8, Panel B, shows that

whilst sponsors facing financial distress in all welfare models except for the Nordic model reduce pension assets invested in equities post-IAS19R, their coefficients are insignificant. However, this study also finds that sponsors following the Nordic model increased investment in equity post-IAS19R. Panel C shows that, whilst there is a large variation in the changes in equity investment across countries post-IAS19R, most economies show an insignificant shift in pension assets invested in equities. However, a significant increase has been observed in allocations to equities by firms in financial distress from Austria and Spain.

Figure 2.3 Mean of %Equities for European and US firms-the role of pension module



The figure at the top depicts a graphical representation of the change in mean values of %Equities between the pre-and post-19R period for each pension module for European (treatment) and the US (control) firms.

Figure 2.4 Average allocation of pension plan assets based on the welfare system

Table 2.7 Allocation of pension plans assets: (H1)

Post x EC	Equities	Bonds	Private Equities	Hedge Fund	Cash	Alter-natives	Real Estate	Others
Panel A: All countries								
	-4.00*	1.62	0.51	0.48	1.82	0.22	0.16	-3.23
	(-1.71)	(0.41)	(0.59)	(0.41)	(0.91)	(0.85)	(0.29)	(-0.77)
Panel B: Pension Model level analysis								
Anglo Saxon	-9.31**	4.50*	0.00	0.04*	0.22	0.07	-0.50***	4.78***
	(-15.37)	(-2.03)	(.)	(7.96)	(0.43)	(5.92)	(-3.17)	(5.25)
Continental	-4.31*	-0.53	0.00	0.00	1.52	0.00	-0.96*	4.28*
	(-2.56)	(-0.20)	(.)	(.)	(1.35)	(.)	(-2.31)	(2.75)
Mediterranean	-4.06	16.09***	0.00	0.00	1.17***	0.00	-8.41***	-4.80***
	(-1.22)	(6.44)	(.)	(.)	(9.29)	(.)	(-6.32)	(-12.33)
Nordic	-3.46	-0.80	0.40	0.00	-0.21	0.27**	-0.62	4.41*
	(-1.21)	(-0.35)	(1.24)	(.)	(-0.29)	(2.78)	(-0.93)	(2.36)
Panel C: Country-level analysis								
Ireland	-8.21	24.28**	0.00	0.00	-3.09	0.00	-1.04	-11.93
	(-1.22)	(2.66)	(.)	(.)	(-1.25)	(.)	(-1.04)	(-1.62)
UK	-9.16***	3.58*	0.00	0.04	0.47	0.08	-0.43	5.17***
	(-4.57)	(1.69)	(.)	-1.52	(0.74)	(1.30)	(-0.93)	(2.90)
Austria	2.90	-9.63	0.00	0.00	-0.73	0.00	-0.48	7.93
	(0.64)	(-1.40)	(.)	(.)	(-0.39)	(.)	(-0.28)	(1.67)
Belgium	4.12	-2.72	0.00	0.00	-0.39	0.00	-0.44	-0.57
	(0.37)	(-0.60)	(.)	(.)	(-0.65)	(.)	(-0.68)	(-0.04)
France	-3.53	0.60	0.00	0.00	-1.62	0.00	-2.84	7.38*
	(-0.92)	(0.12)	(.)	(.)	(-0.56)	(.)	(-1.48)	(1.98)
Germany	-6.98	-2.21	0.00	0.00	2.44	0.00	-0.88	7.63
	(-1.58)	(-0.36)	(.)	(.)	(1.35)	(.)	(-0.69)	(0.91)
Portugal	-9.37	23.29	0.00	0.00	-2.39	0.00	-0.95	-10.58
	(-0.60)	(1.07)	(.)	(.)	(-0.85)	(.)	(-0.82)	(-1.24)
Spain	-8.26	15.84	0.00	0.00	-6.90*	0.00	3.71*	-4.39
	(-1.38)	(1.64)	(.)	(.)	(-2.17)	(.)	(2.47)	(-0.86)
Denmark	-12.35	11.84	0.00	0.00	-3.78	0.00	-2.95	7.24
	(-1.37)	(1.11)	(.)	(.)	(-1.49)	(.)	(-0.87)	(0.53)
Finland	9.71	-2.49	0.00	0.00	1.21	0.31	2.07	-10.80

	(1.17)	(-0.36)	(.)	(.)	(0.80)	(1.17)	(1.17)	(-1.15)
Netherland	-9.90**	0.40	0.00	0.00	2.70**	0.00	-2.90*	9.70**
	(-3.22)	(0.10)	(.)	(.)	(2.91)	(.)	(-2.06)	(2.63)
Norway	-0.35	-5.38	1.87	0.00	-1.20	0.96	-2.22	6.31
	(-0.17)	(-1.35)	(1.08)	(.)	(-0.96)	(1.08)	(-1.62)	(1.16)
Sweden	-8.79**	10.52	0.00	0.00	2.91	0.00	1.48	-6.11
	(-2.64)	(1.53)	(.)	(.)	(0.83)	(.)	(0.76)	(-0.81)

t-tests are in parenthesis. *, ** and *** indicate significance at the 10%, 5%, and 1% levels. Standard errors are clustered by firms. All continuous variables are winsorised to 1 and 99 percentiles levels to mitigate potential bias associated with outliers. All control variables are defined in Table 2.2.

Table 2.8 Allocation of pension plans assets for financially distressed firms: (H2)

	Equities	Bonds	Private Equities	Hedge Fund	Cash	Alternatives	Real Estate	Others
Panel A: All countries								
	-1.36**	0.79	-0.02	0.37	0.41**	0.05	-0.24**	-0.12
	(-2.39)	(1.56)	(-0.15)	(1.32)	(2.23)	(0.85)	(-2.48)	(-0.14)
Panel B: Pension Model level analysis								
Anglo Saxon	-0.10	-0.09	0.00	-0.01***	0.26***	0.04***	0.09***	-0.15***
	(-1.38)	(-1.02)	(.)	(-6.72)	(65.86)	(77.42)	(11.33)	(-6.76)
Continental	0.57	-0.14	0.00	0.00	-0.08	0.00	-0.15	-0.22
	(-1.50)	(-0.13)	(.)	(.)	(-0.38)	(.)	(-1.79)	(-0.18)
Mediterranean	1.29	1.29	0.00	0.00	-2.71	0.00	2.54**	-2.43
	(-0.33)	(0.21)	(.)	(.)	(-1.55)	(.)	(2.06)	(-0.88)
Nordic	0.30*	1.85**	-0.22	0.00	-0.26	-0.12	-0.04	-1.51***
	(1.80)	(4.54)	(-1.52)	(.)	(-1.13)	(-1.53)	(-0.52)	(-5.46)
Panel C: Country-level analysis								
Ireland	-0.92	2.18	0.00	0.00	-0.77	0.00	0.47	-0.96
	(-0.45)	(0.47)	(.)	(.)	(-0.53)	(.)	(1.47)	(-0.24)
UK	-0.15	-0.02	0.00	0.00	0.26*	0.04	0.09	-0.16
	(-0.30)	(-0.08)	(.)	(-0.37)	(1.79)	(0.60)	(0.75)	(-0.31)
Austria	3.68**	-1.00	0.00	0.00	1.30	0.00	-1.53*	-2.45**
	(3.14)	(-0.54)	(.)	(.)	(1.47)	(.)	(-2.39)	(-2.84)
Belgium	-0.10	0.51	0.00	0.00	-0.33**	0.00	-0.01	-0.07
	(-0.09)	(0.56)	(.)	(.)	(-2.87)	(.)	(-0.26)	(-0.04)

France	0.90	0.49	0.00	0.00	-0.49	0.00	-0.37	-0.54
	(1.50)	(0.61)	(.)	(.)	(-0.92)	(.)	(-1.63)	(-0.71)
Germany	-0.59	-3.83	0.00	0.00	0.50	0.00	0.12	3.79
	(-0.49)	(-1.70)	(.)	(.)	(0.94)	(.)	(0.42)	(1.25)
Portugal	4.47	3.69	0.00	0.00	2.68	0.00	-0.81	-10.04*
	(0.37)	(0.22)	(.)	(.)	(0.92)	(.)	(-0.46)	(-2.51)
Spain	14.89*	-28.68*	0.00	0.00	0.41	0.00	2.07*	11.30*
	(1.86)	(-2.37)	(.)	(.)	(0.15)	(.)	(2.30)	(1.90)
Denmark	0.60	0.80	0.00	0.00	-0.56	0.00	-0.33	-0.50
	(0.71)	(0.97)	(.)	(.)	(-1.18)	(.)	(-1.13)	(-0.39)
Finland	2.22	-1.50	0.00	0.00	-1.29**	0.05	0.80*	-0.29
	(1.20)	(-0.88)	(.)	(.)	(-2.77)	-0.81	(1.95)	(-0.11)
Netherland	3.01	-0.65	0.00	0.00	-0.60	0.00	0.56	-2.33
	(1.23)	(-0.22)	(.)	(.)	(-1.25)	(.)	(1.09)	(-1.19)
Norway	0.20	1.58	-0.31	0.00	0.21	-0.19	0.23	-1.71
	(0.49)	(1.20)	(-0.88)	(.)	(0.68)	(-0.88)	(0.88)	(-1.21)
Sweden	1.65	-2.75	0.00	0.00	1.94	0.00	1.09	-1.93
	(0.94)	(-0.75)	(.)	(.)	(0.87)	(.)	(1.70)	(-0.72)

t-tests are in parenthesis. *, ** and *** indicate significance at the 10%, 5%, and 1% levels. Standard errors are clustered by firms. All continuous variables are winsorised to 1 and 99 percentiles levels to mitigate potential bias associated with outliers. All control variables are defined in Table 2.2.

2.5.3.3 Macroeconomic and Corporate governance mechanisms

In order to examine whether the main results are not driven by omitted variables, the main models employ additional firm and country-specific control variables discussed in previous studies (Almaghrabi et al., 2020; Anantharaman & Lee, 2014; Cocco & Volpin, 2007; Karamanou & Vafeas, 2005; Li & Al-Najjar, 2021; Phan & Hegde, 2013; Vafeas & Vlittis, 2016, 2018; Yu-Thompson et al., 2015). More specifically, this study assesses the sensitivity through control variables. First, macroeconomic control variables are included *(i.e., variables definitions and measurements in* Table 2.2*)* to capture the variation across countries such as investor protection, regulation quality, country law system (common vs civil), and corruption level.

The results show that corporate governance mechanisms are included to capture the firm-level variation such as board size, board attendance percentage, percentage of women on the board, percentage of independent directors, size of the audit committee, audit committee attendance percentage, and percentage of independent directors on the audit committee. Amongst the corporate governance mechanisms, the results show that the percentage of women present on the board of directors (*Women%*) is positively associated with equity allocation with is against prior literature that female directors reduce pension risk (Li & Al-Najjar, 2021). Table 2.9 presents the results for H1 and H2 consistent with the main analysis, suggesting that the main findings are robust to these macroeconomic factors and corporate governance mechanisms across countries.

Table 2.9 Test additional Macroeconomic factors and CG mechanisms for (H1) and (H2)

	Pred.	Panel A H1 Original Model		Panel B H2 FD=Z-Score		Panel C H2 FD=Rating	
		Est.	t-test	Est.	t-test	Est.	t-test
PostxEC		-5.556**	(-2.31)				
PostxECxFD				-1.413***	(-2.88)	-0.125***	(-3.17)
FD				1.390**	(2.50)	0.198***	(3.54)
EC		-4.267	(-0.11)	21.167	(0.52)	13.820	(0.36)
Post		-3.573	(-1.16)	-3.666	(-1.34)	-1.086	(-0.39)
Horizon	+	-0.172	(-0.19)	-1.040	(-1.11)	-0.772	(-0.95)
Exposure	-	0.025**	(2.46)	0.027***	(2.80)	0.026***	(2.63)
Funding	+	-0.000	(-0.10)	-0.001	(-0.36)	0.000	(0.04)
Corridor	+	-4.535*	(-1.82)	-4.964**	(-1.99)	-4.884*	(-1.94)
ERR_DR	+	0.481	(1.53)	0.416	(1.37)	0.109	(0.36)
Size	+	-2.532**	(-2.57)	-2.691***	(-2.82)	-2.752***	(-3.09)
STDCF	-	-13.785	(-1.54)	-14.675*	(-1.72)	-11.207	(-1.51)
Leverage	-	-0.063**	(-2.01)	-0.054*	(-1.73)	-0.057*	(-1.82)
Dividend	-	-0.046	(-1.09)	-0.053	(-1.07)	-0.032	(-0.65)
FF	+	-20.433***	(-2.96)	-15.829**	(-2.55)	-17.028***	(-3.25)
Inv_pro	+	0.603	(0.06)	5.830	(0.59)	1.398	(0.15)
Regulation Qual. Rank	-	-0.923	(-0.14)	-4.549	(-0.68)	-5.819	(-0.92)
Legal (common=1)		-6.752	(-0.22)	8.346	(0.28)	25.980	(0.95)
Corruption level	+	-0.798	(-0.16)	1.848	(0.39)	2.209	(0.49)
B_size		-0.064	(-0.37)	-0.092	(-0.54)	-0.026	(-0.15)
B_Meet%		0.016	(0.50)	0.013	(0.44)	0.007	(0.23)
IND %		-0.018	(-0.31)	-0.013	(-0.23)	-0.030	(-0.58)
Women%		0.221**	(2.18)	0.234**	(2.46)	0.227**	(2.54)
AC_IND %		0.068	(1.63)	0.061	(1.49)	0.065	(1.62)
AC_attendance		-0.014	(-0.42)	-0.016	(-0.50)	-0.017	(-0.53)
AC_Size		-0.956	(-0.98)	-0.833	(-0.87)	-0.614	(-0.71)
_cons		223.222*	(1.78)	265.915**	(2.14)	365.859***	(3.10)
Year FE		Yes		Yes		Yes	
Industry FE		Yes		Yes		Yes	
Country FE		Yes		Yes		Yes	
N		3030		3030		3030	
Adj. R^2		0.36		0.38		0.40	

t-tests are in parenthesis. *, ** and *** indicate significance at the 10%, 5%, and 1% levels. Standard errors are clustered by firms. All continuous variables are winsorised to 1 and 99 percentiles levels to mitigate potential bias associated with outliers. All control variables are defined in Table 2.2.

2.6 Conclusion

The accounting standards change the perception of risk of defined benefit pension plans and could trigger risk-taking in the allocation of pension plan assets from equities to bonds (IMF, 2004). The revised IAS 19R changed the mechanism of recognising pension expenses and eventually the reported net income by removing the expected rate of return (ERR) on pension assets and replacing it with the discount rate. This mechanism prevents sponsoring firms from reporting higher expected returns immediately in the net income from higher investment. Previous studies examine the impact of eliminating the ERR on risk-taking behaviour in different pension environments (i.e., Canada, Germany, and the UK), and they reported a competing argument for the effectiveness of eliminating ERR on risk-taking behaviour considering the differences in countries' pension systems (Anantharaman & Chuk, 2018; Barthelme et al., 2019; Vu, 2017). Therefore, this study responded to the call by Barthelme et al. (2019) by examining whether the elimination of ERR assumption affects the allocation of a firm's pension assets in different jurisdictions. In addition, this study examines whether firm-specific characteristics such as financial distress alters the allocation of firms' pension assets.

To examine these research questions, this study draws upon a sample of thirteen European countries between 2009 and 2014 using the DID technique. The findings show that DB pension plan sponsors shift-out equities in pension plans after eliminating the earning smoothing device (the ERR assumptions) as the discretion in the expected reported income was removed. Furthermore, the results show that, in general, firms in financial distress reduce pension investment in equity after eliminating the ERR assumptions. The results are robust to an alternative measure of financial distress and control variables.

This study further investigates a less explored asset class, *other assets* class in the pension funds, which has not yet been applied in previous research; this study demonstrates a significant decline in real estate asset classes, suggesting that firms not only de-risk pension plan portfolios by shifting-out of equity but also shifting-out of real estate (i.e., high-risk asset class) to reduce pension plan risk across the four pension models. Therefore, the findings suggest that the effect of changes in the pension accounting standards is contingent upon the firms' financial positions and social welfare system. For instance, the implication of the social system and the mandatory requirements for finding ratios which may have an impact on a firm's financial stability. Put together, these contributions to the literature shed light on the real effect of changes in pension accounting standards (IAS 19R) on the risk-taking behaviour of sponsors of the DB pension scheme.

This research offers several contributions. First, the empirical evidence is consistent with the risk management perspective that pension investment risk influences firms to adopt pension de-risking strategies after eliminating the income smoothing device. Second, the findings of this study extend the literature on the determinants of the allocation of pension plan assets highlighting the implications of firms' financial position on pension investment strategies. Third, previous studies mainly focused on investigating factors that influence the allocation of pension plan assets from high-risk assets (i.e. equities) to fixed-income securities (Amir et al., 2010; Anantharaman & Chuk, 2018; Barthelme et al., 2019), this study extends the current literature by examining whether firms re-allocate pension plan assets from equities to *other assets* class, other than fixed-income securities to reduce pension risk shedding light on the residual asset class (i.e. *other assets*). Fourth, as a pension scheme reflects a country's

welfare system, this study examines the implications of changes in the accounting standards on a broader range of economies, considering the dimension of social welfare characteristics.

Whilst this study has some limitations. Firstly, the DB obligation is subject to several assumptions, such as interest rate, longevity assumption, and salary progression assumption. Therefore, future research can extend the current literature (Billings et al., 2017) by examining whether the mandatory elimination of ERR assumptions is combined with changes in other pension assumptions that could affect projected pension obligation and funding status. This can help regulators better understand whether sponsor firms use their judgment in other places on the pension policy to avoid the impacts of changes in accounting standards and to boost the reported income. Secondly, recent studies have documented the impact of public policy options on managing benefit risks. Thus, future studies may examine whether countries' public policy influences public-private mix systems on the firms' policy options. Lastly, the fertility rate influences the pension system (Boldrin et al., 2015; Cigno, 1993) and is declining in some European countries (Eurostat, 2022). Future studies could also examine the impact of the employment-population ratio across age groups on pension plan assets investment decisions and their implication on matching pension plan assets and pension plan obligations (i.e., pension risk) (Chapman & Naughton, 2016; Franzoni & Marín, 2006).

Chapter 3: Unionisation and pension information specificity: Evidence from the UK Strategic Report

ABSTRACT

Purpose

This study investigates the effect of stakeholder pressure, specifically arising from strong unionisation, on a firm's disclosure strategy. It explores whether firms adjust the quality and quantity of their disclosure in response to high labour proprietary costs of disclosure when facing salient stakeholders such as organised labour. In particular, this study examines whether unionisation has an impact on the pension information specificity and whether this relationship is moderated by the level of cash holdings.

Design/Methodology/Approach

The study relies on an automated content analysis approach to evaluate the specificity of defined benefit pension plan information for 119 FTSE350 listed firms over the period 2017 to 2019, resulting in a total of 357 firm-year observations. Trade union density is measured by multiplying the firms' industry average of unionisation by the number of employees.

Findings

The results show a decline in the pension information specificity in the strategic report over the years despite an increase in the reports' length. Trade union density is positively associated with the pension information specificty, suggesting that the presence of salient stakeholders (employees), reflected in higher levels of unionisation, improves the quality and quantity of pension disclosure. This relationship is stronger when sponsoring firms have higher cash holdings or when firms face social or environmental issues, presumably to mitigate legal risk, maintain information advantage and secure more bargaining power with trade unions.

Originality/Value

This study contributes to the determinantal role of unionisation as a salient stakeholder in firms' disclosure strategies. The findings also highlight the relevance of cash holdings on employee-related disclosures.

Keywords

unionisation; pension disclosure; cash holdings; specificity of disclosure; proprietary cost of disclosure; social issues; strategic disclosure

3.1 Introduction

Trade unions normally play a significant role in advancing staff employability, protecting worker interests, and improving working conditions (Böheim & Booth, 2004; Freeman & Medoff, 1984; Green et al., 1999; Kaufman, 2004; Saundry et al., 2011). While trade unions may collaborate with management to facilitate corporate operations when the goals of shareholders and employees are aligned (Bronars & Deere, 1991; Chen et al., 2011; Freeman, 1984; Hirsch, 1991; Kaufman, 2004), in some cases, various tactics such as collective bargaining, lobbying, and industrial actions may be employed to make employees' voices heard and advance employees' benefits (Aobdia & Cheng, 2018; Chyz et al., 2013; Faleye et al., 2006; Verrecchia, 1983). These activities may be perceived by managers as a way for trade unions to gain undue power to influence operations (Xing et al., 2017) and to exert pressure through rent-seeking behaviours (Baldwin, 1983). This can undermine the collaborative and trust-based relationships between trade unions and management, potentially resulting in negative consequences for firms and their shareholders (Chantziaras, Dedoulis, & Leventis, 2020; Chantziaras et al., 2021; Chyz et al., 2013).

Prior literature provides consistent evidence that managers seek to curb trade unions' bargaining power and rent-seeking behaviours and improve their bargaining position with trade unions by adopting diverse strategies, such as altering information asymmetry (Bova et al., 2015; Cheng, 2017; Hilary, 2006; Scott, 1994), earnings management (DeAngelo & DeAngelo, 1991), corporate investment and finance decisions (Denny & Nickell, 1991; Eberts, 1983; Fallick & Hassett, 1999), limit cash holdings (Ahmad & Kowalewski, 2021; Chen et al., 2011; Klasa et al., 2009), increase leverage (Bronars & Deere, 1991; Klasa et al., 2009; Matsa, 2010) and exhibit higher levels of tax aggressiveness (Chyz et al., 2013); with a view to convey an unflattering financial picture and secure concessions. On a related point, since trade unions could rely on narratives in financial disclosures to convey a picture of firms' financial

performance (Aobdia & Cheng, 2018), previous research contends that managers are reluctant to disclose information about their firms' performance to preserve an information advantage, which therefore gives them a better bargaining position (Bova et al., 2015; Cheng, 2017; Chung et al., 2016; Hilary, 2006; Kalyta & Magnan, 2008; Kleiner & Bouillon, 1988). For instance, Chung et al. (2016) provide evidence that firms facing powerful trade unions disclose information less frequently, particularly information about "good news", during the negotiations period. Hence, managers appear to adopt disclosure strategies to gain a better bargaining position. In addition, Arslan-Ayaydin et al. (2021) document that a more unionised firm can influence the narrative content of corporate disclosure and document. So, firms use a less-optimistic tone of qualitative information in earning press releases during labour negotiations.

While previous studies examine information related to firms' financial performance disclosed that is primarily focused on the equity market, there is limited understanding of the impact of the quality and quantity of disclosure on stakeholders outside the equity market, such as employee-related non-financial information (Aobdia et al., 2022; Blankespoor et al., 2020).

This may be consistent with the evidence that trade unions are involved in the strategic planning of organisations, indicating the awareness of trade unions regarding the long-term future of the industry in which they are engaged. This, in turn, implies a greater acceptance of responsibility by unions for that future. It also suggests that employers are willing to share that responsibility. Mills (1978) documented an agreement between the government and a major UK company, Chrysler UK, wherein the participating trade unions explicitly stated that their involvement would not impact their collective bargaining agreements. However, they diligently examined sales forecasts, manufacturing and sourcing plans, employment considerations, financing, and actively engaged in working parties. It is worth noting that Chrysler experienced an 80 percent improvement in the company's strike record in 1976,

attributed not to the threat of redundancies but to the enhanced information available to the workforce resulting from the planning agreement process.

In this context, while it could be argued that trade unions might obtain pension information from the footnotes of financial statements, the information presented in the strategic report serves as a fundamental source of long-term insights for trade unions in their planning processes, surpassing what is available in the financial statement footnotes. For instance, strategic reports offer analyses of key risks and types of principal risks, with pension risk being identified as a principal risk to the corporation. Additionally, firms may include information in their strategic reports about their fund arrangements for funding pension schemes in the upcoming years, detailing amounts by years and scheme names, which is not available in the financial statement footnotes. This type of information is crucial for long-term decision-making due to its inherently long-term nature.

Against this backdrop, this study examines the impact of unionisation on pension information disclosures[3] in UK companies' strategic reports. More specifically, this study investigates whether firms facing stronger unionisation alter the pension information specificity in the strategic report, a disclosure strategy by sponsoring firms to obfuscate disclosure to maintain their information advantage or gain bargaining power. In addition, previous literature suggests that managers tend to maintain lower cash holding to improve their bargaining power against trade unions (Klasa et al., 2009; Matsa, 2010) to make a more convincing argument that the risk of liquidity shortages threatens their viability; a situation that may grant managers additional concessions from trade unions. Thus, this study also examines whether sponsoring firms use cash holdings as a mechanism to moderate this relationship.

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[3] pension information disclosures, pension information specificity

To address the above, this study relies on a sample of publicly listed companies in FTSE350 companies between the years 2017 and 2019, yielding a total of 357 firm-year observations. The method for measuring *Specificity* follows Hope et al. (2016) and seeks to quantify the extent of specific words used in the qualitative information for the defined benefit (DB) pension plans in the strategic report. The results indicate that managers of companies facing higher unionisation tend to provide more specific pension information, counter to the belief that highly unionised firms provide less transparent and vague information to weaken the trade unions' power (Arslan-Ayaydin et al., 2021; Chung et al., 2016). Furthermore, an interaction of cash holding with unionisation is used in explaining the direction of the relationship between pension information specificity and unionisation. The results show that high cash holding positively influences the association between unionisation and pension information specificity. These results suggest that firms with higher cash holding tend to disclose more specific information, potentially because they have more resources to do so and may also perceive the benefit of providing such information as a mean of maintaining a positive relationship with employees and improving their bargaining position with trade unions.

Since firms have a greater incentive to maintain information asymmetry by altering the quality and quantity of the disclosure to gain higher bargaining power, they may potentially face higher proprietary costs of disclosure from labour bargaining, such as those with heavier pension obligations (Aobdia et al., 2022). Thus, the pension information specificity in the strategic report may be driven by the overall disclosure strategy of the report rather than its specific component. Dyer et al. (2017) examined the textual characteristics of whether firms' disclosure strategies for the same topic differ across the 10-K report, irrespective of whether the topic appears in any section, such as the footnote, risk factors, or MD&A. They found that firms significantly increase the disclosure length even when additional information may not have been as relevant. These results suggest that firms appear to be more flexible in tailoring

their disclosure strategy based on materiality. In this regard, further analysis was conducted to examine the association between the specificity of the strategic report as a whole and unionisation. The findings reveal no significant evidence of the impact of unionisation on the specificity of strategic reports, suggesting that firms employ flexible disclosure strategies. These pivotal insights are robust to a battery of sensitivity tests.

This chapter contributes to the literature in the following ways. First, whilst previous studies have raised concerns about the marginalisation of the role of employees in corporate reporting (Chantziaraset al., 2020; Vithana et al., 2021), this study provides more direct evidence for the impact of trade unions as a salient stakeholder on the quality of disclosure in a narrative report. This also answers the call by Blankespoor et al. (2020) to examine the impact of disclosure on non-equity stakeholders and the context that can influence empirical prediction differently. The results show that when the labour-related proprietary cost is high, firms disclose high quality and more specific disclosure.

Second, scholars also demonstrated that vague and non-specific information has capital market implications such as increases in the costs of capital (Campbell et al., 2014; Cazier et al., 2020; Hope et al., 2016; Kravet & Muslu, 2013). The current pension disclosure proxies that measure the quality of pension disclosure are based on the mandatory requirement of IAS 19R in the notes of the financial statements (Almaghrabi et al., 2020). The current study contributes to the pension accounting literature by providing an alternative mechanism to examine the narratives of pension information (within the strategic report) as a new dimension of the quality of pension disclosure; particularly, firms have become more reliant on non-financial disclosure from narrative information (Noh et al., 2019) as a mechanism to reduce information asymmetry and improve decision-making (Healy & Palepu, 2001).

Third, this study contributes to the literature on textual analysis by using an alternative measure for information characteristics. While previous studies have extensively examined the quality of qualitative information such as readability (Li, 2008), length (Dyer et al., 2017), and boilerplate (Cazier & Pfeiffer, 2017; Dyer et al., 2017), there is a lack of research on other qualitative disclosure characteristics such as specificity (Cazier & Pfeiffer, 2017; Dyer et al., 2017; Hope et al., 2016)[4].

Finally, practitioners and regulators have also expressed concerns about the increasing trend of vagueness and decreasing specificity of textual disclosure. This trend raises information asymmetry concerns for disclosures in financial statements (FRC, 2018, 2022; IASB, 2018; SEC, 1998), ultimately affecting stakeholders' decisions. This study illustrates how the specificity of information within the strategic report can provide a complementary dimension of disclosure quality. Additionally, the results demonstrate how firms use different disclosure strategies across the strategic report based on the salience of their stakeholders.

The remainder of this study is organized as follows. Section 3.2 presents the background on unionisation and reviews the relevant literature, whilst section 3.3 presents the hypotheses. Section 3.4 discusses the research design, and section 3.5 presents the main results and additional analysis. Finally, section 3.6 offers concluding remarks.

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[4] See Appendix 3.2 and 3.3 for additional sources.

3.2 Background and Literature Review

3.2.1 Background on unionisation

Trade unions play a vital role in the workforce, typically negotiating wages and benefits for their members, impacting productivity, work allocation, and health, safety and well-being aspects (Böheim & Booth, 2004; Freeman & Medoff, 1984; Green et al., 1999; Kaufman, 2004; Saundry et al., 2011; Sowden & Sinha, 2005). However, the impact or influence of trade unions can vary significantly. Over the last two decades or so, unionisation rates differed significantly across countries and industries, with Europe generally having higher rates than other regions. Notwithstanding the contemporary shows of force in 2022 and 2023, the status of trade unions in the UK has been in a state of decline. This decline in union power has been attributed to a variety of factors, such as changes in the labour market, government policies, legislation governing industrial actions and changes in employment relations (Addison, 2020). It is worth noting that the decline in UK trade union density, i.e. the percentage share of employees who are union members, has decreased over the last two decades, from 50% in the mid-1980s to 18% in 2000 and 12.8% in 2021 (ONS, 2022). This reduction is most noticeable in the private sector, whilst trade union density in the public sector was 60% in 2000 and 50.1% in 2021. Despite this decline, the Trades Union Congress still represents 5.5 million members belonging to 48 affiliated trade unions (TUC, 2023a), which is still high and close to the membership figures in other countries, such as Germany which has 6 million members from 8 trade unions (ETUI, 2020).

Industrial relations practices and frameworks do vary significantly between countries, highlighting the levels of formalisation regarding trade union negotiations, with some having more formal legal contracts and others relying on voluntary agreements. In a majority of countries on the European continent, collective agreements are a form of legal contract. For example, the law assists union-based institutions in Sweden and Norway. The United States of

America is well known for having a mechanism in place to protect the mandatory recognition of trade unions by law since the mid-thirties as part of American labour law. In Britain, there were several attempts to mandate the recognition of trade unions which were later repealed (Townshend-Smith, 1981). Hyman (2001) documents that the government was reluctant to directly regulate collective bargaining, with some minimal intervention through Arbitration Services.

The level of unionisation across advanced market economies is also affected by structural economic characteristics, and institutional and political factors such as government antagonism towards trade unions, employer organisations, and societal policies and values (OECD, 1990). The voluntary nature of the industrial relationship between capital and labour, and the lack of institutionalism in the relationship between employees and employers make trade unions vulnerable to a low level of trade union support, and some employers attempt to exclude trade unions from companies (Korpi & Shalev, 1979). Trade unions in countries such as Germany rely on their strong institutional role to affect public policy and industrial change at the national and sector level. Whilst UK's trade unions have taken a more defensive approach to their pay and condition (TUC, 2023b), focusing on protecting pension rights (Flynn et al., 2013). Consequently, the UK's trade unions' activism remains localized and decentralized, which generally hampers their attempts to confront employers. Additionally, the nature of the UK's relationship between trade unions and employers suggests that the stronger the relationship between trade unions and employers, the higher the collective agreement. This implies that higher collective agreement stems from the solid relationship between trade unions and employers, not due to the pressure of trade unions on employers due to legal requirements. In this regard, employers are capable of doing so due to their greater resources and may also view the provision of such information as a way to cultivate a positive relationship with employees and enhance their bargaining position with trade unions.

3.2.2 Corporate disclosure in the presence of unionisation

While employees believe, from their perspective, that they invest their time and expertise which contribute to the growth and success of the company (Chen et al., 2016; Edmans, 2011; Faleye & Trahan, 2011; Hasan et al., 2018; Wei et al., 2020), they require transparency and timely information about the firm's plans and financial performance to make informed decisions about their human capital investment (Hasnaoui et al., 2021; Lajili & Zéghal, 2006; Lin et al., 2012) and their employment benefits, including pension plans (Chen et al., 2011; Scott, 1994). However, managers of sponsoring firms may view such demands for information as rent-seeking behaviour by employees and their representatives, to extract unjustified benefits and consume a firm's resources (DeAngelo & DeAngelo, 1991; Klasa et al., 2009; Matsa, 2010). This perception arises due to the perceived ability of trade unions to influence corporate decisions or operations through organized strikes (Hui & Chan, 2021; Jansen, 2014; Korpi & Shalev, 1979; Molina & Barranco, 2016).

In response, managers may engage in various strategies to mitigate trade union pressures and protect shareholders' wealth, such as downward reported earnings during union negotiations (DeAngelo & DeAngelo, 1991), downward reported earnings more frequently (Bova, 2013), smoother earnings (D'Souza et al., 2001; Hamm et al., 2018; Liberty & Zimmerman, 1986), more debt issuance (Bronars & Deere, 1990; Matsa, 2010), dividend cuts (DeAngelo & DeAngelo, 1991), and lower cash holding (Ahmad & Kowalewski, 2021; Chen et al., 2011; Klasa et al., 2009).

Furthermore, previous studies provide evidence that firms facing strong unionisation alter their disclosure quality, such as narrative disclosure depending on the proprietary costs of such information (Healy & Palepu, 2001; Verrecchia, 2001), to secure favourable collective bargaining results. Tan et al. (2022) examined the relationship between firms' employment

quality and the readability of their 10-K disclosures, and found a positive association between employment quality and 10-K readability. This suggests that firms consider employees a key stakeholder, and that initiatives to promote disclosure readability may be undermined by firms that place less emphasis on employment quality. Aobdia et al. (2022) investigated the implications of disclosure frictions on trade unions as stakeholders and in decision-making contexts outside the equity market. They found that firms reduce the likelihood and frequency of voluntary disclosures of "good news" to maintain an information advantage and bargaining power position with labour unions, highlighting the importance of higher labour-related proprietary costs of disclosures. Arslan-Ayaydin et al. (2021) studied narrative tone as a text attribute, specifically the influence of trade unions on firms' disclosure tone. They found a positive association between trade unions and the tone of the disclosure, with firms deflating the tone of earnings press releases to convey a less optimistic image of the firm's financial performance to unions. They documented that firms facing higher unionisation use a less optimistic tone in the qualitative part of their earnings press release when financial performance is strong. In short, given that trade unions primarily rely on public disclosure for collective bargaining purposes, firms facing strong unionisation continue to change their disclosure strategies to improve their information advantage and gain more bargaining power.

While unionisation incentivises managers to maintain an opaque information environment to gain information collective bargaining advantage (Hilary, 2006), these disclosure strategies can have negative consequences for firms, particularly if they decide to disclose poor-quality information. This is due to stakeholders, including equity and non-equity stakeholders, being uncertain about the firm’s intentions and performance due to poor disclosure, resulting in higher reporting bias (Blankespoor et al., 2020; Cukierman & Meltzer, 1986; Fischer & Verrecchia, 2000). This bias can translate into higher costs of capital, greater stock price volatility, stock price crash risk, and a decline in the ability of market analysts to

assess fundamental risks (Ben-Nasr & Ghouma, 2018; Callen et al., 2013; Franco et al., 2015; Hope et al., 2016; Huang et al., 2014; Jin & Myers, 2006; Lehavy et al., 2011; Merkley, 2014; Miller, 2010). Despite the positive accounting theory concerning different stakeholders, firms may also have an objective to under-report the disclosure quality to mitigate trade unions from extracting above-market rent (Watts & Zimmerman, 1986).

Recent studies have found that narrative disclosure can significantly impact a firm's capital market outcomes, with a strong association between textual narrative attributes, such as readability, tone, and boilerplate language, and various factors, including earnings performance (Huang et al., 2014; Merkley, 2014), analysts' perceptions (Franco et al., 2015; Lehavy et al., 2011), market reaction and trade volume (Callen et al., 2013; Franco et al., 2015; Hope et al., 2016; Miller, 2010), litigation risk (Nelson & Pritchard, 2007), disclosure of risk factors (Campbell et al., 2014; Cazier et al., 2020; Hope et al., 2016; Kravet & Muslu, 2013) and the cost of capital (Athanasakou et al., 2020; Bonsall & Miller, 2017). This means that firms should aim to provide high-quality disclosure that is relevant and credible, whilst also considering the potential negative consequences of withholding (good or bad news) or disclosing poor-quality information (Goldstein & Yang, 2019; Indjejikian, 1991; Skinner, 1994; Teoh & Hwang, 1991). By doing so, they can better manage their capital market outcomes and improve their overall financial performance.

In this regard, it is evident that there is a conflict between employees' demand for transparency through high-quality disclosure and managers' inclination to safeguard shareholders' wealth. This tension is fuelled by employees' ability and power to strike, which could have negative consequences on firms' performances. As a result, managers may adopt certain disclosure strategies to curb rent-seeking behaviour that could harm the companies. However, the nature of this relationship is not fully comprehended, particularly in the context of unionisation. Therefore, the trade-off between the disclosure strategy employed by firms in

the context of unionisation and narrative disclosure and how this association could affect multiple non-equity market stakeholders, such as employees and their representatives, remains inconclusive (Aobdia et al., 2022; Blankespoor et al., 2020).

3.3 Theoretical Framework and Hypotheses Development

3.3.1 Theoretical framework

Freeman (1984) and Mitchell et al. (1997) both extended stakeholder theory (i.e. stakeholder salient), which is framed to understand how a group of people can affect or are affected, by an organisation's objectives (Leopizzi, 2020). Freeman (1984) introduced the concept of stakeholder salience, which posits that organisations have multiple stakeholders, including shareholders, customers, employees, suppliers, and the community, each with their interests and expectations. Mitchell et al. (1997) builds on Freeman's (1984) definition and suggest that stakeholders vary in their salience, whereby firms will prioritize the needs and demands of stakeholders who are most important to the organisation. Mitchell et al. (1997) reveal that a stakeholders' salience is a function of three main factors: the power to influence the firm, the legitimacy of the relationship, and the urgency of their claim on the firm. Firms prioritise their stakeholders based on these three dimensions to satisfy their expectations. However, these dimensions change over time as the organisation's goals and strategies change, and as the external environment changes. This overcomes the limitation of stakeholder theory in terms of defining which stakeholder(s) matters. From a unitarist perspective, employees represented by trade unions are viewed as primary stakeholders (Brown, 2000; Clement, 2005; Mitchell et al., 1997). This is due to employees being considered business partners who invest their time and expertise, which contributes to the growth and success of the company (Chen et al., 2016; Edmans, 2011; Faleye & Trahan, 2011; Hasan et al., 2018; Wei et al., 2020).

The stakeholder salient theory (Mitchell et al., 1997) has been proposed to explain the disclosure practices in firms facing powerful stakeholders such as employees and their trade unions to meet their expectations, and how powerful stakeholders such as trade unions can influence the firm's disclosure strategy. This theory identifies the links between stakeholder management and the achievement of organisational objectives, such as manipulating disclosures in favour of powerful stakeholders (Ntim & Soobaroyen, 2013).

Collective Bargaining Theory (CBT) also suggests that trade unions work in the interests of their members and negotiate with management on their behalf (Feller, 1973). Trade unions discuss several elements about employees; however, one of the fundamental elements is employees' benefits, particularly pension schemes which utilise in the annual report to enhance their bargaining power. Thus, the more detailed information about pension schemes, the better the trade union's position to negotiate a fair and equitable benefit for members. Moreover, detailed information about pension schemes allows trade unions to monitor management performance and hold them accountable for funding the scheme. Thus, CBT suggests that stronger unionisation may lead to greater pension information specificity due to the bargaining power that the trade unions can exert over management to disclose more detailed information. Taken together, these theories suggest that trade unions may play a significant role in shaping firms' disclosure strategies, particularly for employee-related ones such as pension information. Hence, in firms with higher trade union density, trade unions may be able to negotiate for greater specificity in the information provided about pension plans, which may be used to improve their bargaining position during collective agreements. Hence, theory x and theory y serve as the underpinning perspective for the hypotheses.

3.3.2 Hypotheses development

Unionisation could affect the disclosure quality through its real effect on firms' activities. Regarding the real effect of trade unions, the literature on the impact of trade unions on corporate decisions is divided. The collective voice view suggests that trade unions have a positive effect on productivity by reducing employee turnover, improving morale and cooperation among workers, and allowing for the implementation of better policies that reflect the aggregate preferences of all employees (Freeman & Medoff, 1979). This is because employees and their trade unions are seen as primary stakeholders (Brown, 2000; Clement, 2005; Mitchell et al., 1997) who contribute to the growth of the company (Chen et al., 2016; Edmans, 2011; Faleye & Trahan, 2011; Hasan et al., 2018; Wei et al., 2020). However, the collective bargaining view argues that trade unions can influence and raise wages above the equilibrium level, encouraging shirking, and lowering society's output due to the ability and realisation of workers to go on strike (Hui & Chan, 2021; Jansen, 2014; Korpi & Shalev, 1979; Molina & Barranco, 2016). When both parties are powerful, the conflict between management and trade unions becomes more pronounced (John et al., 2015), making it more difficult for managers to balance interests and set priorities (Tirole, 2001).

Regarding information quality, trade unions rely on annual reports as a primary source of firm-specific information, such as the company's culture, employment quality, strategies, risks, and governance (Tan et al., 2022; Vithana et al., 2021). On the one hand, according to the stakeholder salient perspective, it can be expected that firms may provide high-quality disclosure regarding their employees, especially about employee benefits, as it affects the usefulness of the information and ultimately the decisions and bargaining position of trade unions during collective bargaining. This implies that companies with higher unionisation may provide more specific information, for example, about pension schemes, to assist employees in making retirement decisions as they view employees represented by trade unions as primary

stakeholders. Moreover, unionisation could improve the quality of the information environment in unionised firms through their proactive role in improving the information flow (Kim et al., 2021) through union's rent-seeking that could reduce the managerial tendency to withhold bad news to provide a negative picture about their future to strengthen their negotiation position (Bova, 2013; Bowen et al., 1995; DeAngelo & DeAngelo, 1991; Goldstein & Yang, 2019; Kim et al., 2021).

On the other hand, it can also be argued that a higher unionisation rate can increase information opacity because it may incentivise managers to withhold and preserve information asymmetry between firms and employees due to their concern that an information release would weaken firms' bargaining power over trade unions (Chung et al., 2016; Hilary, 2006; Verrecchia, 1983). Scott (1994) finds that Canadian firms tend to disclose less regarding their pension plan, which is one of the important disclosures for trade union negotiation when a strike is looming. Therefore, managers of higher unionisation might obscure the disclosure in annual reports to gain an information advantage and strengthen their bargaining power. Moreover, other reasons for the lack of information flow could be the higher level of employees' welfare that management can use as a tool to gain loyalty and lower effort wage bargaining (Cronqvist et al., 2009) and to make employees less likely to act as potential whistle-blowers (Ben-Nasr & Ghouma, 2018; Dyck et al., 2010).

Despite claims that employees are primary stakeholders and that firms incorporate their demands into corporate decisions, the impact of unionisation on firms' disclosure policies regarding detailed and symbolic disclosure about the firm and employment benefits, remains inconclusive. Therefore, it is proposed to consider the following non-directional hypothesis:

H1: *There is a significant association between unionisation and pension information specificity.*

A larger cash balance may allow unionised workers to capture a larger fraction of firm profits through rent-seeking behaviour. Matsa (2010) argues that firms with high liquidity may face challenges from unionised workers engaging in rent-seeking behaviour. Thus, firms may reduce cash holdings to mitigate such behaviour, as large cash holdings may also weaken their bargaining power during negotiation in the face of strong trade unions, as well as to protect corporate income from trade unions' demands (Ahmad & Kowalewski, 2021; Klasa et al., 2009). This suggests that higher unionisation leads to holding fewer liquid assets to make a more credible case that the risk of liquidity shortages threatens their competitive viability. This situation may grant additional concessions from unions and improve future collective bargaining outcomes. According to collective bargaining theory, although, it can be expected that firms with higher cash holding may be less inclined to provide detailed information about their pension schemes when facing higher unionisation to avoid potential proprietary costs such as strikes and increasing bargaining power, firms may provide more detailed information when facing weak financial position or liquidity to grant additional concessions from unions and improve future collective bargaining outcomes

In contrast, unionisation may facilitate transparency of information flow and reduce information asymmetry (Kleiner & Bouillon, 1988) by requesting additional information from management (Robbins, 1994). Drawing upon stakeholder salience theory (Brown, 2000; Mitchell et al., 1997), it can be argued that firms with a high cash holding may be more willing to provide detailed information about the firm and their pension scheme to employees represented by trade unions. This is because they have more resources to do so and may also perceive the benefit of providing such information as a mean of maintaining a positive relationship with employees and improving their bargaining position with trade unions.

Given the theoretical and empirical evidence on how cash holding may affect the association between the level of unionisation and quality of pension information specificity, the second non-hypothesis has been formulated as follows:

***H2**: Firm's cash holding has a significant impact on the association between unionisation and pension information specificity.*

3.4 Research Design

3.4.1 Data and sample selection

The present study aims to investigate the relationship between unionisation and the pension information specificity in the strategic report of firms. The sample covers all firms listed in the London stock exchange (LSE) for three years with active defined benefit plans from 2017 to 2019. Firms with defined contribution plans are excluded to isolate risk-taking behaviour. Additionally, sponsoring firms with the missing firm- and pension plan-specific control variables are excluded.

Finally, the sample is limited to large firms listed in FTSE 350 which yielded 357 firm-year observations, as shown in Table 3.1. The allocation of the sample across years and industry are presented in Table 3.2. The annual reports for the sample were obtained from various sources, including annualreports.com and firm websites and pension information is collected manually from the strategic report for each firm-year observation. Additionally, control

Table 3.1 Sample Selection

	Total firms	
All listed firms in LSE between 2017 and 2019 have active DB pension plan		662
Less:		
Firms with defined contribution plans	-41	
Missing observation with firm-specific variables	-81	
Missing observation with pension-specific variables	-84	
Total sample for all listed firms between 2017 and 2019	-206	456
Limit the sample to firms listed in FTSE 350		-99
Final Sample		**357**

variables such as financial and performance indicators are obtained from Bloomberg and Thomson Reuters Eikon. The definition of all variables is provided in Table 3.4.

Table 3.2 Sample Composition

Panel A: By years		
Years	Obser.	Obser. %
2017	119.00	33.33%
2018	119.00	33.33%
2019	119.00	33.33%
Total	**357.00**	**100.00%**
Panel B: By Industry		
Industries	Obser.	Obser. %
Wholesale and retail trade; repair of motor vehicles and motorcycles	42.00	11.76%
Manufacturing	135.00	37.82%
Accommodation and food service activities	12.00	3.36%
Transportation and storage	12.00	3.36%
Financial and insurance activities	6.00	1.68%
Administrative and support service activities	15.00	4.20%
Utilities	21.00	5.88%
Professional, scientific, and technical activities	21.00	5.88%
Construction	27.00	7.56%
Information and communication	30.00	8.40%
Real estate activities	21.00	5.88%
Arts, entertainment, and recreation	3.00	0.84%
Mining and quarrying	12.00	3.36%

This table provides data for sample composition based on the industry average for the number and percentage of pension information and strategic information relative to the length (total number of words) of the entire strategic report.

The focus of this study is on pension information in the Strategic Reports of UK-listed companies for several reasons. Firstly, regulators require publicly listed companies to include a strategic report as part of their annual report and to provide specific information about elements that have an impact on the firm's strategy, such as defined benefit pension plan information (FRC, 2014, 2018) and their implications on firm decisions, such as risk uncertainty and funding arrangements. Additionally, management scholars have found that strategic planning plays a key role, not only in communication but also in providing supplementary corporate information about firms' performance to stakeholders (Al-Bazzaz & Grinyer, 1980; Armstrong, 1982; Greenley, 1986). Furthermore, unlike in the USA where annual reporting is structured by a highly regulated form of *10-K*, UK firms are granted

considerable discretion in both the content (i.e., breadth and depth) and format of their annual report disclosure, allowing for variation across firms in their reporting behaviour.

The lack of availability of unionisation data at the firm level in the UK market poses a significant challenge for this research. To overcome this issue, following the literature in labour economics (Bronars & Deere, 1990; Hilary, 2006; Mitra & Hakjoon Song, 2017), a proxy for trade unions has been operationalized using industry-level unionisation data. The Office for National Statistics (ONS) provided the industry unionisation data for the 2017-2019 period, which is publicly available online.

3.4.2 Measure of unionisation

Previous studies on trade unions assume that industry unionisation rates are a reasonable proxy for the expected unionisation rates of firms within an industry and use them as a proxy for a union's bargaining power (Bronars & Deere, 1991; Karier, 1985; Rosen, 1969). The underlying argument is that a union's bargaining power is stronger for highly unionised firms due to the significant consequences a disruption of labour might cause for such firms. The lack of availability of unionisation data at firm level in the UK market poses a significant challenge for this research as it was difficult to reliably collect firm-level unionisation data from the filing of annual reports of listed companies as firms do not have to provide the number of unionised workforces. Thus, following the literature in labour economics (Bronars & Deere, 1990; Hilary, 2006; Mitra & Hakjoon Song, 2017), the level of a firm's unionisation is measured as a function of industry unionisation rate by multiplying the industry average of trade union density from ONS by the number of employees following Equation (1):

$$Unionisation_{ix} = \text{Log}\ (Trade\ union\ density_{iy} x\ Number\ of\ employees_{ix}) \quad (1)$$

where:
Trade union density: Industry average of Trade union membership as a proportion of employees.

i: the current year
x: firm name
y: Industry name

3.4.3 Measure of specificity

This study examines the specificity of the text which is a measure of the extent of specific reference material in the narrative that uses clear and precise language to convey its meaning, making it more cohesive (Sydserff & Weetman, 1999). Historically, large firms are known for providing a more symbolic or passive disclosure and lower substantiative disclosure about their compliance statutes for the legal requirements (Day & Woodward, 2004; Shrives & Brennan, 2015; Sydserff & Weetman, 1999; Warsame et al., 2002). Therefore, several authors emphasise the importance of narrative specificity and incorporate it in their assessment (Akkermans et al., 2007; Beretta & Bozzolan, 2004; de Beaugrande & Dressler, 1981; Dyer et al., 2017; Hope et al., 2016; Sydserff & Weetman, 1999).

In the context of pension information in the strategic report, the specificity of narrative disclosure refers to the frequency and precision of the pension information provided in the strategic report. This gives a sense of the density of pension information, in quantitative terms, as texts that have quantitative information tend to be more precise and more verifiable than symbolic disclosure that contains general descriptions of information (Beretta & Bozzolan, 2004; Shrives & Brennan, 2015; Sydserff & Weetman, 1999).

This study utilizes a sample of 357 strategic reports from firms having active defined benefit (DB) pension plans. The pension information section in the strategic report is initially extracted manually from the annual report and then analysed using the Quenteda package, which utilizes R and Python programming languages to identify group-specific data types using a Natural Language Processing (NLP) tool (Lewis & Young, 2019a). This package allows for separation and detects each word in the text with a separate tag and then groups the words with

similar characteristics to each tag. The package allows the capture of eighteen tags, and each tag represents different types of data, as shown in Table 3.3.

Table 3.3 Types of Specificity Tags

Sn	spaCy recognizes the following entities	Meaning	Tag	Hope et al. (2016)
1	PERSON	People, including fictional.	Person	Yes
2	NORP	Nationalities or religious or political groups.	Other	No
3	FAC	Buildings, airports, highways, bridges, etc.	Other	No
4	ORG	Companies, agencies, institutions, etc.	Organisation	Yes
5	GPE	Countries, cities, states.	Location	Yes
6	LOC	Non-GPE locations, mountain ranges, bodies of water.	Location	No
7	PRODUCT	Objects, vehicles, foods, etc. (Not services.)	Other	No
8	EVENT	Named hurricanes, battles, wars, sports events, etc.	Other	No
9	WORK_OF_ART	Titles of books, songs, etc.	Other	No
10	LAW	Named documents are made into laws.	Other	No
11	LANGUAGE	Any named language.	Other	No
12	DATE	Absolute or relative dates or periods.	Dates	Yes
13	TIME	Times smaller than a day.	Times	Yes
14	PERCENT	Percentage, including ”%“.	Percentage	Yes
15	MONEY	Monetary values, including unit.	Money	Yes
16	QUANTITY	Measurements, as of weight or distance.	Other	No
17	ORDINAL	“first,” “second,” etc.	Other	No
18	CARDINAL	Numerals that do not fall under another type.	Other	No

Following Hope et al. (2016) and Dyer et al. (2017), tags have been limited to seven types of specific information (i.e. Person Name, Organisation Name, Location, Date, Time, Percentage, and Monetary values). This approach provides a score based on several criteria of the text, which extend the previous textual measure of specificity that was built using only three categorial variables (de Beaugrande & Dressler, 1981; Sydserff & Weetman, 1999). The approach followed in this study creates a score calculated as the ratio of pension information-specific words in the strategic report as a proportion of all pension information words in the strategic report, excluding stop words. This scoring approach provides a continuous variable that allows a higher level of variation across firms in capturing the specificity in their text.

To establish external validity, since the concept of specificity is novel in the literature, validity tests were conducted by soliciting manual scores of pension disclosure and strategic report

from both senior undergraduate accounting students and PhD students in accounting. Subsequently, a comparison was made between the scores obtained using the NER-based measure and the scores provided by the students, revealing a strong correlation, suggesting that the chosen measure exhibits external validity.

3.4.4 Multivariate analysis

3.4.4.1 Hypothesis 1: Unionisation and Pension Information Specificity (PIS)

To determine the relationship between narrative pension information specificity and unionisation, this study employs a pooled regression with standard error clustered at firm level, as outlined by (Petersen, 2009). This method accounts for both year and industry-fixed effects, to control for any external factors that may influence the results. The following model using Equation (1), examines the effect of unionisation on the level of pension information specificity.

$$PIS_{it} = \alpha_0 + \alpha_1 Unionisation_{it} + \alpha_2 Controls_{it} + \Sigma\, Year + \Sigma\, Ind + \varepsilon_{it} \qquad (1)$$

3.4.4.2 Hypothesis 2: Unionisation and Pension Information Specificity (PIS) – The role of cash holding.

To examine the relationship between unionisation and the level of pension disclosure, this study uses cash holdings as a moderating variable to capture whether firms disclose more specific pension information in the face of stronger unionisation. The hypothesis suggests that higher cash holdings indicate a stronger association between unionisation and pension information specificity as an indication of the impact of unionisation on disclosure. To test this hypothesis, the baseline model is extended to include the moderating effect of cash holdings on the relationship between unionisation and pension information specificity, as shown in Equation (2), as follows:

$$PIS_{it} = \alpha_0 + \alpha_1 Unionisation\ x\ CH_{it} + \alpha_2 Control_{it} + \Sigma\ Year + \Sigma\ Ind + \varepsilon_{it} \quad (2)$$

3.4.5 Control variables

To test the main hypothesis, this study employs a regression specification and control variables that have been used in previous studies (see Table 3.4). It has been established that firm performance can significantly influence disclosure content (Miller, 2002); therefore, the study includes measures of firm performance as control variables. Additionally, the study includes control variables such as the specificity of the entire strategic report (Hope et al., 2016), the level of cash holding (Benmelech et al., 2012; Klasa et al., 2009; Matsa, 2010), the firm's financial distress (*Altman Z-Score*) (Benmelech et al., 2011, 2012), leverage (*Leverage*) (Hope et al., 2016), market-to-book ratio (*MTB*) (Dyer et al., 2017; Hope et al., 2016), firm size (*Size*) (Dyer et al., 2017; Hope et al., 2016), return on assets (*ROA*), and a dummy variable for firms that have losses at the end of the accounting period (*Loss*) (Dyer et al., 2017). Moreover, this study includes pension plan performance variables, such as the funding ratio (Funding) (Rauh, 2006), as control variables to account for any potential impact of pension plan specifications on disclosure specificity.

Table 3.4 Variable Descriptions

Variable		Description	Source/Database	Reference from previous literature.
Dependant Variables (DV)				
Specificity		The number of entities (locations, people, organisations, currency, percentages, dates, or times) identified by the Stanford Named Entity Recognizer (NER) tool, scaled by the total number of words (see Hope et al., 2016, for more details). This ratio is then multiplied by 100.	Annual reports/Strategic reports Manually /Computerized generated score using Python and R	(Dyer et al., 2017; Hope et al., 2016)
Independent Variables (IDV)				
Trade Union Density	+	Trade unions membership as a proportion of employees.	Office for National Statistics (ONS)	(Denny & Nickell, 1991; Menezes-Filho et al., 1998)
Collective Bargaining Agreements	+	The proportion of employees whose pay and conditions are agreed upon in negotiations	Office for National Statistics (ONS)	(Denny & Nickell, 1991; Menezes-Filho et al., 1998)

		between the employer and a trade union.		
Control Variables				
SRS	+	Strategic report specificity		(Dyer et al., 2017; Hope et al., 2016)
Cash holding	-	Natural log of cash and cash equivalent at the end of the period	Bloomberg	(Benmelech et al., 2012; Klasa et al., 2009; Matsa, 2010)
Altman Z-score	-	A score of financial distress. The firm is in financial distress if the score is below or equal to 1.8, and safe otherwise.	Bloomberg	(Benmelech et al., 2011, 2012)
Leverage	+	Long-term debt and short-term debt divided by total assets	Bloomberg	(Hope et al., 2016)
MTB ratio	-	Market value of Equity to Book value of Equity	Bloomberg	(Dyer et al., 2017; Hope et al., 2016)
PB ratio		Price-to-book value ratio	Bloomberg	
Size	-	Natural logarithm of market capitalisation	Bloomberg	(Dyer et al., 2017; Hope et al., 2016)
ROA		Net income to total assets.	Bloomberg	
Loss	-	Dummy variable equals one if the firm reports a loss in the current year and 0 otherwise.	Bloomberg	(Dyer et al., 2017)
Funding	+	Percentage of pension plan assets to projected benefit obligation	Bloomberg	(Rauh, 2006)
Board size		Number of directors on the board	Bloomberg	(Bowe & Larik, 2014)
Board_ID%		Percentage of independent directors on the board	Bloomberg	(Bowe & Larik, 2014)
Board_ FEMALE%		Percentage of Female directors on the board	Bloomberg	(Bowe & Larik, 2014)
AC_ID%		Percentage of independent directors in the audit committee	Bloomberg	(Bowe & Larik, 2014)
AC_MEET		Number of audit committee meetings during the year	Bloomberg	(Bowe & Larik, 2014)
AC_SIZE		Size of the audit committee	Bloomberg	(Bowe & Larik, 2014)
No. Analysts		Number of analysts following the company	Bloomberg	(Chang et al., 2023 ; Hu et al., 2021)
Equity_ category%		Percentage of equity investment in the defined benefit pension plan.	Bloomberg	

3.5 Results

3.5.1 Trends in information attributes

Figure 3.1 Panels A and B, illustrate the trade-off between the specificity and length of the strategic report and whether an increase in the length of the report is consistent with an increase in the level of detail and specific information provided. Although there is an increase in the length and word count of strategic reports, there is a drop in the level of detail and specific information provided, suggesting that reports have become vaguer and do not provide clear and specific information. Particularly, the pattern of decreasing information specificity in strategic reports has been nearly monotonic over the period analysed. Similarly, Panels C and D show pension information, which follows a similar trend as the strategic report, highlighting that pension information in the strategic report has become less specific and vaguer despite being lengthier. Although, Pension Information Specificity (PIS) shows an upward trend between 2017 and 2018, however, this trend began to decline from 2018 onward.

The change in information attributes behaviour was observed around 2018, which could be ascribed to public policy forces and changes in corporate governance codes, specifically the mandatory workforce engagement mechanism required by Section 172. These findings provide initial evidence of the impact of public policy and corporate governance on the pension information specificity in strategic reports (see Appendix 3.1)[5].

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[5] Additional analysis to examine whether the drop in pension information specificity is due to introducing the new requirement of Section 172 Companies Act 2006. The baseline regression is used by adding Year 2018 as a dummy variable and interaction between Year 2018 and the unionisation proxy to examine the impact of introducing the new policy. The results show that the coefficient of the interaction is insignificant suggesting that the main results are not driven by the new policy – see Appendix 3.1.

Figure 3.1 Textual Attributes of strategic report and pension information

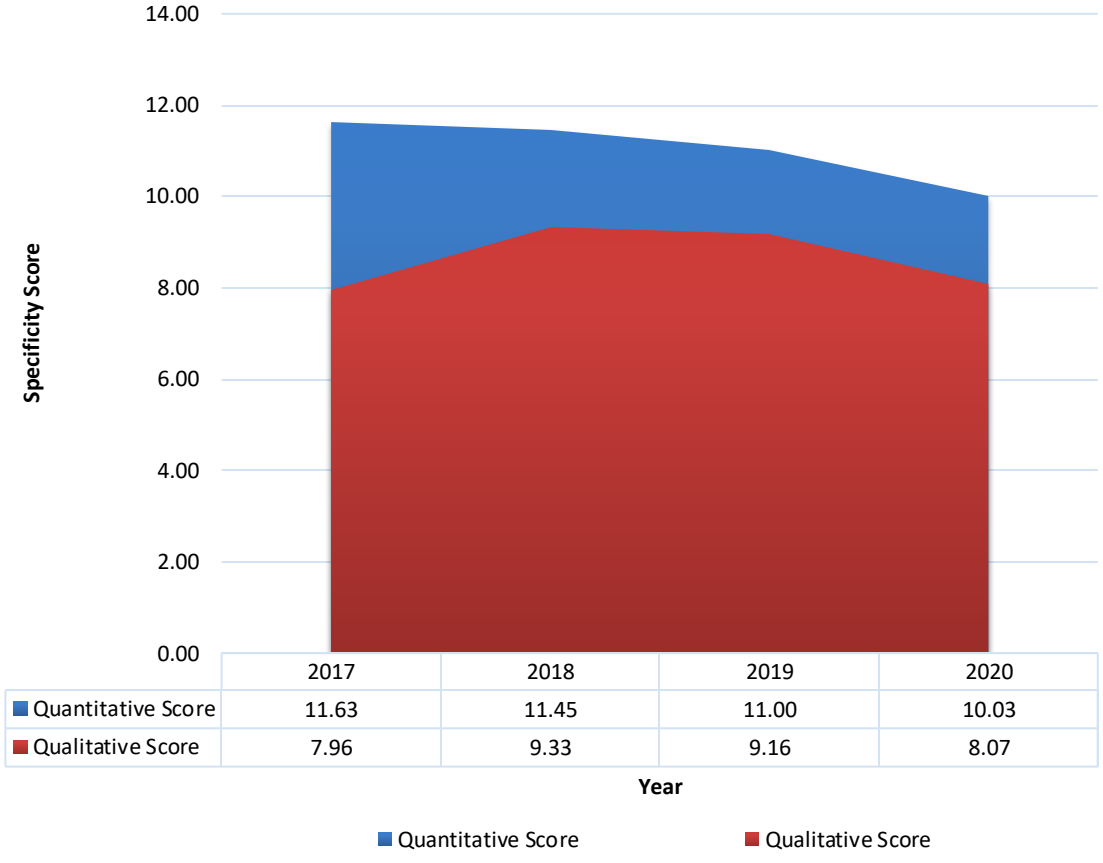
The extent to which each of the entire strategic report and pension information topic inside the strategic report changed for the average length and average specificity of text over time between 2017 and 2020.

Figure 3.2, Panel A, illustrates the degree of pension information specificity in the strategic report, which is further classified into qualitative (e.g., locations, people, organisations) and quantitative characteristics (e.g., currency, percentages, dates, or times).

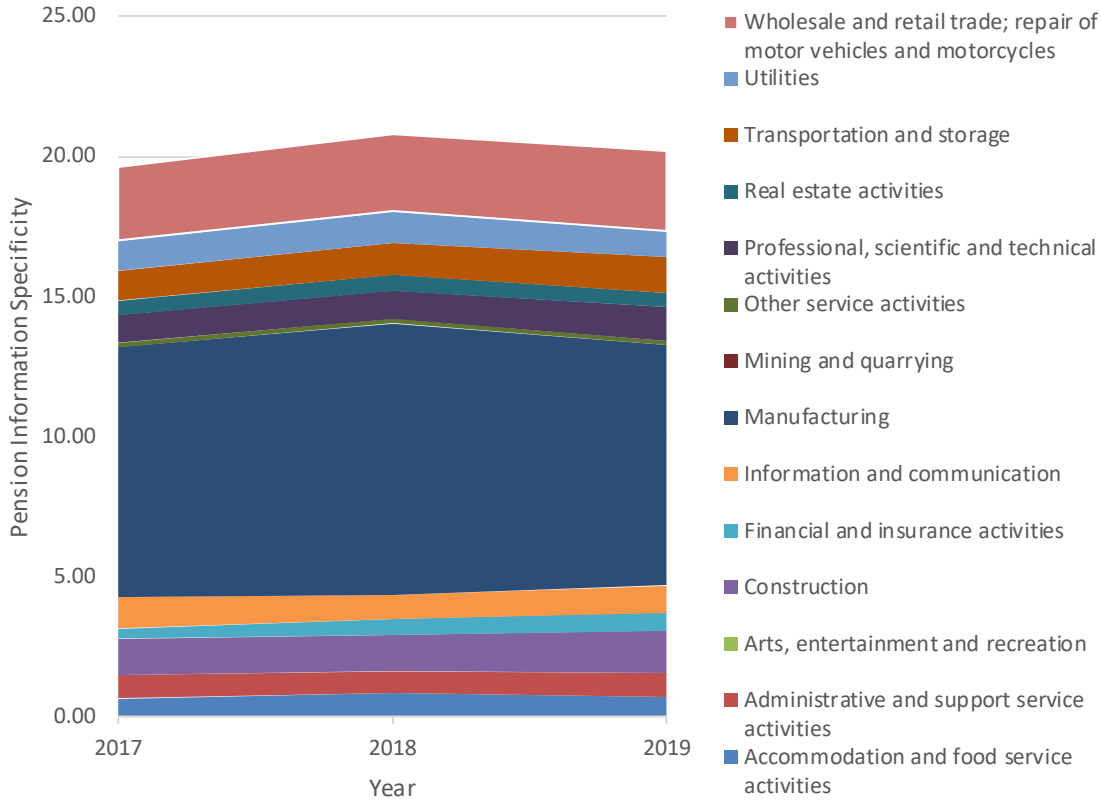
The figure indicates that the level of quantitative information is higher than that of qualitative information in the pension disclosure in the strategic report. Specifically, in 2017, the gap between the qualitative and quantitative information was wider, indicating that the disclosure was more specific. However, whilst this gap has since narrowed, the reduction in quantitative information exceeds that of qualitative information. Panel B presents the allocation of pension information specificity scores across these industries. The graph illustrates significant variability in scores across industries, with the highest scores observed in the utilities and technology sectors and the lowest scores in the basic materials and consumer cyclical sectors.

Figure 3.2 Pension Information Specificity (PIS) in strategic reports

Panel A Pension Information Specificity (PIS) Score by characteristics



Panel B Pension Information Specificity (PIS) Score by industry



3.5.2 Descriptive statistics

The sample composition, as presented in Table 3.5, Panel A, is balanced and distributed equally across firms. The table shows that firms increase the length of their strategic reports and disclose more specific information. However, the increase in pension information specific words is lower than the increase in the overall length of the strategic reports. This suggests that although firms provide lengthier reports, they may not be providing proportionate specific information regarding pension plans. Table 3.5, Panel B, reports on the sample allocation based on ONS industry classification. The dataset reports industry unionisation rates for thirteen industry classifications, representing the percentage of trade union density for each industry. The sample is concentrated in certain industries as shown in Table 3.2, Panel B, such as manufacturing, which accounts for 37.50% of the sample, and wholesale and retail trade, repair of motor vehicles and motorcycles, which accounts for 11.18%. Whilst these industries

represent a sizable portion of the sample, it is noteworthy that the sample is not dominated by a specific industry. Amongst all industries represented in the sample, other service activities, wholesale, and retail trade, repair of motor vehicles and motorcycles, and manufacturing exhibit the highest level of specificity at 17.07%, 16.06%, and 15.84%, respectively.

Table 3.5 Descriptive statistics for information specificity in the Strategic Report

Panel A: By years						
Years	PIS (%)	PIS (# of Words)	PI (# of Words)	SRS (%)	SRS (# of Words)	SR (# of Words)
2017	12.63	27.87	180.03	11.56	1796.22	15559
2018	13.33	30.55	185.65	11.47	1941.26	16838
2019	13.11	29.26	186.84	11.26	2015.01	18209
Panel B: By Industry						
Industries	PIS (%)	PIS (# of Words)	PI (# of Words)	SRS (%)	SRS (# of Words)	SR (# of Words)
Wholesale and retail trade; repair of motor vehicles and motorcycles	16.62	31.38	179.62	11.80	1575.45	13593
Manufacturing	16.06	37.03	219.65	11.01	1895.17	17139
Accommodation and food service activities	15.70	28.50	155.50	12.90	1956.83	15035
Transportation and storage	14.66	19.25	132.67	12.80	2169.75	16991
Financial and insurance activities	12.92	26.83	150.33	12.28	1765.17	14110
Administrative and support service activities	12.46	30.47	215.13	10.94	2188.00	19955
Utilities	11.91	35.48	287.76	10.25	2027.29	19902
Professional, scientific, and technical activities	10.85	34.52	258.33	11.35	1920.19	16981
Construction	10.61	17.22	100.93	11.45	1732.70	15274
Information and communication	9.75	29.57	202.63	11.48	1902.27	16942
Real estate activities	4.66	4.95	31.62	12.23	1888.86	15444
Arts, entertainment, and recreation	0.00	0.00	1.00	12.03	1313.67	10930
Mining and quarrying	0.00	0.00	2.17	12.70	3270.33	26395

This table provides data for sample composition based on the industry average for the number and percentage of pension information and strategic information relative to the length (total number of words) of the entire strategic report.
PIS(%): The ratio of pension information-specific words in the strategic report, as a proportion of all pension information words in the strategic report, excluding stop words.
PIS(#of Words): Total specific words of pension information in the strategic report excluding stop words.
PI(#of Words): Total number of pension-related Words in the strategic report, excluding stop words.
SRS(%): The ratio of specific words in the strategic report, as a proportion of all words in the strategic report, excluding stop words.
SRS(#of Words): Total number of specific words in the strategic report, excluding stop words.
SR(#of Words): Total number of words in strategic report, excluding stop words.

Table 3.6, Panel A, provides an overview of the sample used in this study. The average level of specificity in pension disclosure is 13.02, indicating that on average, firms provide a moderate level of detail in their pension disclosure. In terms of the correlation among the variables, Table 3.6, Panel B, shows a positive but statistically insignificant association between trade union density and the level of specificity in pension disclosure. This suggests that the relationship between unionisation and pension information specificity is not clear-cut. However, there is a significant negative relationship between specificity and cash holding, which implies that firms with high levels of cash holdings tend to provide less specific information about their pension plans. Furthermore, there is a negative significant relationship between specificity and firm size, with small firms tending to provide more specific information than large firms. Finally, there is a positive significant association between specificity and funding ratio, showing that firms with strong funding for their pension plans tend to provide more detailed information in their disclosures compared to firms with weaker funding ratios.

Table 3.6 Descriptive Statistics

Panel A Summary statistics of dependent variables and control variables								
Variable	Obs.	Mean	S.D.	Min	0.25	Median	0.75	Max
PIS	357	13.02	8.37	0.00	7.79	14.34	18.67	40.00
SRS	357	11.43	2.27	6.85	10.08	11.18	12.40	34.35
Unions Density	357	5.38	1.53	0.21	4.52	5.37	6.39	8.97
Cash Holding	357	12.45	1.71	7.17	11.32	12.23	13.48	17.10
Altman Z-Score	357	4.50	4.25	-0.68	2.37	3.71	5.28	39.96
Leverage	357	5.14	19.04	0.00	1.83	2.28	3.52	199.12
MTB	357	3.72	8.98	-43.30	1.43	2.32	4.22	82.50
PB	357	6.08	32.23	0.00	1.50	2.43	4.48	596.12
Size	357	8.36	1.36	5.28	7.34	8.26	9.00	12.25
ROA	357	7.44	7.59	-16.90	3.36	6.09	10.55	50.00
Loss	357	0.08	0.26	0.00	0.00	0.00	0.00	1.00
Funding	357	92.29	23.73	0.00	86.43	97.26	104.54	131.98

Panel B: Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) PIS	1.00											
(2) SRS	0.08	1.00										
	(0.11)											
(3) Union Density	0.05	-0.10	1.00									
	(0.24)	(0.03)										
(4) Cash Holding	-0.13*	0.02	0.63*	1.00								
	(0.01)	(0.74)	(0.00)									
(5) Altman Z-Score	-0.05	-0.09	-0.22*	-0.24*	1.00							
	(0.32)	(0.06)	(0.00)	(0.00)								
(6) Leverage	0.02	-0.09	0.14*	0.11	-0.13*	1.00						
	(0.62)	(0.06)	(0.00)	(0.02)	(0.01)							
(7) MTB	-0.07	-0.06	-0.06	-0.11	0.59*	0.05	1.00					
	(0.12)	(0.22)	(0.23)	(0.02)	(0.00)	(0.31)						
(8) PB	-0.07	-0.01	-0.07	-0.09	0.40*	0.13*	0.53*	1.00				
	(0.13)	(0.82)	(0.14)	(0.06)	(0.00)	(0.01)	(0.00)					
(9) Size	-0.21*	0.00	0.56*	0.75*	0.05	0.02	0.12*	0.04	1.00			
	(0.00)	(0.93)	(0.00)	(0.00)	(0.31)	(0.67)	(0.01)	(0.34)				
(10) ROA	-0.01	0.01	-0.13*	-0.07	0.60*	-0.10	0.44*	0.27*	0.18*	1.00		
	(0.75)	(0.81)	(0.00)	(0.14)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)			
(11) Loss	-0.02	-0.02	0.00	-0.03	-0.18*	0.17*	-0.13*	-0.01	-0.15*	-0.49*	1.00	
	(0.70)	(0.67)	(0.96)	(0.55)	(0.00)	(0.00)	(0.00)	(0.78)	(0.00)	(0.00)		
(12) Funding	0.14*	-0.18*	0.06	0.12*	0.04	-0.04	0.08	-0.01	0.08	-0.03	0.02	1.00
	(0.00)	(0.00)	(0.21)	(0.01)	(0.45)	(0.42)	(0.08)	(0.84)	(0.08)	(0.53)	(0.70)	

*** p<0.01, ** p<0.05, * p<0.1

3.5.3 Multivariate regression

3.5.3.1 Hypothesis 1: Unionisation and Pension information specificity (PIS)

Table 3.7 presents the results for the impact of unionisation on Pension Information Specificity (PIS). A regression analysis was conducted, with the level of pension information specificity modelled as the dependent variable and unionisation as the independent variable. The analysis shows a statistically significant positive association between unionisation and the pension information specificity in the narrative of a firm's strategic report. The coefficient of *Unionisation* is 1.322 and statistically significant at a 5% level of significance. On average, a one standard deviation increase in trade union density level is associated with an 11.07% increase in the pension information specificity in the strategic report ((1.322*8.37) as per Table 3.6, Panel A, and Table 3.7).

The findings indicate that firms with higher levels of unionisation rates are more likely to provide more specific pension information. These findings support the view of stakeholders' salience (Brown, 2000; Clement, 2005; Mitchell et al., 1997) and prior literature that firms disclose high-quality disclosure about their employees' benefits when the unionisation rate is high (Bova, 2013; Bowen et al., 1995; DeAngelo & DeAngelo, 1991; Goldstein & Yang, 2019; Kim et al., 2021, 2021) suggesting that trade unions are powerful stakeholders who can contribute to improve the quality of firms' disclosure quality, and firms should align and strengthen the trust relationship.

In addition, the study controls for various firm-specific characteristics, including leverage (*Leverage*), return on assets (*ROA*), and funding ratios (*Funding*), which are found to positively impact the pension information specificity. Whilst firm size (*Size*) is found to negatively impact the pension information specificity. The coefficient for cash holding (*Cash Holding*), Altman's Z-Score (*Altman's Z-Score*), market-to-book ratio (*MTB*), price-to-book ratio (*PB*), and loss

(*Loss*) are found to be insignificant. The positive association between trade union density as a measure of unionisation and pension information specificity suggests that firms provide more detailed pension-related information in the presence of higher unionisation.

Table 3.7 Unionisation and PIS (H1)

	(1)		(2)	
	OLS		2SLS	
Unionisation	***1.322****	***(2.07)***	***2.950****	***(1.67)***
SRS	0.602**	(2.55)	0.688***	(3.53)
Cash Holding	-0.209	(-0.38)	-0.520	(-1.03)
Altman Z-Score	-0.019	(-0.11)	0.175	(0.69)
Leverage	0.022*	(1.74)	0.013	(0.54)
MTB	-0.079	(-1.20)	-0.102	(-1.56)
PB	-0.011	(-1.62)	-0.011	(-0.85)
Size	-1.950***	(-2.98)	-2.640***	(-3.05)
ROA	0.132*	(1.67)	0.133*	(1.86)
Loss	-0.498	(-0.33)	-0.376	(-0.24)
Funding	0.075***	(2.76)	0.070***	(3.56)
cons	-0.785	(-0.11)	-1.047	(-0.22)
FE Year	Included		Included	
FE Industry	Included		Included	
N	357		357	
Adj. R^2	0.33		0.30	

This table presents the results of OLS analysis of the relationship between the pension information specificity and trade union density, controlling for various firm characteristics and performance indicators. The regression model includes year and industry fixed effects, and standard errors are adjusted for heteroskedasticity and serial correlation, as well as clustered at the firm level.
The number in parentheses represents the t-test value.
***, **, and * denote the statistical significancy at 1%, 5%, and 10%, respectively.
All variables are defined in Table 3.4

Weak instrument test	
F-test	18.86
Critical value	16.38
Endogeneity test	
Durbin-Wu-Hausman test	0.87
p-value	0.35

3.5.3.2 Hypothesis 2: Unionisation and Pension information specificity (PIS) - The role of cash holding policy.

Table 3.8 presents the results for testing the second hypothesis (H2) using Equation (2). The sample is divided into subsamples based on the cash holding median, and OLS regressions are conducted separately for each subsample. Column 1 suggests a positive association between PIS and trade union density in firms with high cash holding (coefficient: 2.153, statistically

significant at 1% level). However, in firms with low cash holding, there is a negative association between PIS and trade union density (coefficient: -0.345), which is not statistically significant. This implies that firms with high cash holding may be more willing to provide detailed information about their pension schemes with higher unionisation, as they may have more resources to do so and may also see the benefits of providing such information in terms of supporting positive relationships with employees and improving their bargaining position with trade unions.

Moreover, the study further documents that firms with high cash-holding disclosure are more precise in pension disclosure when the unionisation rate is higher. These findings support the view that unionisation may facilitate transparency of information flow and reduce information asymmetry (Kleiner & Bouillon, 1988) by requesting additional information from management (Robbins, 1994), and firms consider trade unions as a salient stakeholder (Brown, 2000; Mitchell et al., 1997). This is because they have more resources to do so and may also perceive the benefit of providing such information as a mean of maintaining a positive relationship with employees and improving their bargaining position with trade unions. In the same vain, the results are against the view that firms with high liquidity may face challenges from unionised workers engaging in rent-seeking behaviour (Ahmad & Kowalewski, 2021; Klasa et al., 2009; Matsa, 2010).[6]

Table 3.8 Unionisation and PIS - The role of cash holding policy (H2)

	(1)		(2)	
	High Cash holding		Low Cash holding	
Unionisation	***2.153******	***(3.12)***	***0.345***	***(0.30)***
SRS	0.532	(1.29)	0.660**	(2.60)
Altman Z-Score	1.112**	(2.38)	-0.225	(-1.11)
Leverage	0.006	(0.21)	-0.047	(-0.28)
MTB	0.016	(0.26)	-0.123*	(-1.72)
PB	0.094	(0.97)	-0.002	(-0.75)
Size	-2.513***	(-3.59)	-1.539	(-1.53)
ROA	0.069	(0.65)	0.147	(0.75)
Loss	0.448	(0.23)	0.014	(0.01)

[6] In untabulated additional analysis using a pooled specification and include an interaction, i.e. Unionisation X Cash holdings (Cash holding can be defined as a dummy above/below the median value, the results shows that co-efficient of the interaction is statistically insignificant.

Funding	0.102***	(2.69)	0.039	(0.87)
_cons	-7.602	(-0.89)	-2.873	(-0.30)
FE Year	Included		Included	
FE Industry	Included		Included	
N	207		150	
Adj. R^2	0.32		0.41	

This table presents the results of an OLS analysis, which examines the relationship between pension information specificity and unionisation measured by trade union density whilst controlling for various other factors. The sample is divided into two sub-samples based on the median level of cash holdings. The regression includes year and industry-fixed effects, and standard errors are corrected for heteroskedasticity and serial correlation and clustered at the firm level.
The number in parentheses represents the t-test value.
***, **, and * denote the statistical significancy at 1%, 5%, and 10%, respectively.
All variables are defined in Table 3.4

Furthermore, healthy firms (*Altman Z-Score*) tend to disclose more detailed and specific information about their pension schemes when they have high cash holdings. Moreover, the study also found that large firms (*Size*) with high cash holdings are often unwilling to disclose specific information about their pension plans compared to those with low cash holdings. Lastly, firms with higher funding ratios (*Funding*) and high cash holdings tend to provide more specific information about their pension schemes. Overall, the findings suggest that trade union density improves the quality of disclosure and provides more specific information about pension plans in firms with high cash holdings. However, in firms with low cash holdings, the potential proprietary costs of disclosing such information outweigh the benefits.

3.5.4 Additional analysis

3.5.4.1 Is the effect confined to trade unions' density? – The role of collective bargaining

Despite the results of the main analysis, there is an inherent issue with the measurement of the independent variable. Trade union density does not measure union power and voice fully. More importantly, trade union density does not indicate where the interest of trade unions lies. While the average impact of trade union density on pension information specificity is statistically and economically significant, a question about different trade unions' utility functions remains. Therefore, this study aims to find if the association between trade unions and pension

information specificity persists when using collective agreements as an alternative measure of trade union power. The idea is to examine not only the presence of trade unions in organisations but also the power of trade unionisation, specifically their ability to influence management decisions or have proprietary costs.

Since collective bargaining is a measure of unionisation power and trade union density can capture the union's ability to change disclosure strategy, results should remain the same if a collective agreement is used instead of trade union density as a measure of union power. If the result does not hold, it means that a higher trade union density does not necessarily imply that they are powerful enough to influence management decisions or have significant proprietary costs. To examine the unionisation power, the study employs trade union collective agreement (*Unionisation_CA*) as an alternative proxy which is measured as collective agreement per industry multiplied by the number of employees per firm.

Table 3.9 presents the results of the trade unions' proxy for the H1 and H2. Column 1 reports the results for H1 showing that pension information specificity is positively associated with trade unions proxies which are consistent with the main analysis. Column 2 shows that the level of pension information specificity is positively associated with the unionisation collective agreement (*Unionisation_CA*). Whilst the results reported in Column 3 show insignificant results for form holding law cash holding. These findings suggest that the trade union's density is a reliable proxy for trade union power, as the results are consistent with the main hypothesis.[7]

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[7] In untabulated additional analysis for using collective agreement as an alternative measure for unionisation using a pooled specification and include an interaction, i.e. Unionisation X Cash holdings (Cash holding can be defined as a dummy above/below the median value, the results shows that co-efficient of the interaction is statistically insignificant.

Table 3.9 Additional Test: Alternative Proxy for Unionisation Power

	(1)		(2)		(3)	
	H1		H2			
	Full Sample		High Cash holding		Law Cash holding	
Unionisation_CA	***1.312****	***(2.05)***	***2.231*****	***(3.29)***	***0.289***	***(0.25)***
SRS	0.604**	(2.56)	0.632	(1.52)	0.656**	(2.56)
Cash Holding	-0.204	(-0.37)	-0.914	(-1.13)	-0.065	(-0.06)
Altman Z-Score	-0.018	(-0.10)	0.935*	(1.85)	-0.233	(-1.15)
Leverage	0.022*	(1.75)	0.012	(0.41)	-0.045	(-0.26)
MTB	-0.079	(-1.20)	0.018	(0.30)	-0.123	(-1.55)
PB	-0.011*	(-1.67)	0.073	(0.76)	-0.002	(-0.72)
Size	-1.950***	(-2.97)	-1.963**	(-2.33)	-1.494	(-1.35)
ROA	0.131	(1.65)	0.073	(0.70)	0.147	(0.76)
Loss	-0.497	(-0.33)	0.863	(0.44)	-0.040	(-0.02)
Funding	0.075***	(2.76)	2.231***	(3.29)	0.289	(0.25)
_cons	-1.024	(-0.14)	-0.561	(-0.05)	-2.115	(-0.24)
FE Year	Included		Included		Included	
FE Industry	Included		Included		Included	
N	357		207		150	
Adj. R^2	0.33		0.32		0.40	

The following table presents the results of the OLS estimation, which uses collective agreement as an alternative measure of trade union power to test H1. H2, and H3. The regression includes year and industry fixed effects, and the standard errors are robust to heteroskedasticity and serial correlation, as well as clustered at the firm level.
The number in parentheses represents the t-test value.
***, **, and * denote the statistical significancy at 1%, 5%, and 10%, respectively.
All variables are defined in Table 3.4

3.5.4.1 Does strategic report specificity (SRS) tell a different story?

Although firms continue to provide lengthy strategic reports, they often lack detailed and firm-specific information, as illustrated in Figure 3.1 Panels A and B. Previous studies have provided evidence of this lack of specificity and the increase in boilerplate disclosure (Cazier & Pfeiffer, 2017; Dyer et al., 2017). In addition, these findings suggest that firms tend to follow topical strategies when disclosing information in their annual reports. Moreover, both practitioners and regulators claim that firms still provide generic and excessively long disclosure (Berkman, 2018; FRC, 2022). The main hypothesis of this study posits that trade unions exert pressure on firms to extract more benefits, which may result in managers manipulating disclosure to gain better bargaining power during negotiations. However, it remains unclear whether managers manipulate information about the company's overall financial performance and adopt different disclosure strategies to serve different stakeholders

or adopt topical disclosure strategies (Dyer et al., 2017), such as focusing specifically on pension information to mislead trade unions.

To investigate whether firms consistently exhibit transparency and disclosure behaviour in their strategic reports or alter their behaviour in response to higher unionisation rates, particularly with respect to their pension information, which is often a significant aspect of employee benefits, this study utilizes a consistent method to measure the specificity score of all information included in the strategic reports of 119 companies over the period 2017 to 2019. By applying the same procedures to measure pension information specificity and other information in the strategic reports, this study facilitates a comprehensive and objective evaluation of the relationship between trade unions and pension information attributes in the strategic reports of companies.

Table 3.10 presents the result for the association between unionisation and strategic report specificity, which suggests a negative association between trade union density and the level of specificity of information in strategic reports. Specifically, column 1 shows the results of H1 that the coefficient for trade union density is -0.302 but statistically insignificant. This suggests that firms tend to decrease the level of specificity in their strategic reports when the presence of unionisation is high. This finding contradicts the initial hypothesis proposed in this study, which anticipated a positive correlation between trade union density and the pension information specificity contained in strategic reports. This could be due to firms adopting different disclosing strategies according to the salient and proprietary costs of their stakeholders.

Columns 2 and 3 report the results to test H2 for the moderating effect of cash holding on the association between the strategic report specificity and trade unions' density. In contrast to the main analysis, a negative association is observed between the specificity of information

provided in the strategic report and trade union density in firms with low cash holding, which is statistically significant at a 10% level. These findings suggest that firms with low cash holding may use vaguer and less specific information in their strategic reports as a means of manipulating disclosure quality to affect capital markets and strengthen their bargaining power with trade unions, and therefore, corporate cash holding may play a moderating role in the relationship between trade union density and the pension information specificity provided in the strategic report. Furthermore, it shows that firms adjust their reporting strategies according to the significance of their stakeholders (Mitchell et al., 1997)[8].

Table 3.10 Additional Test: Unionisation and Strategic Report Specificity (SRS)

	(1)		(2)		(3)	
	H1		H2			
	Full Sample		High cash holding		Low cash holding	
Unionisation	***-0.302***	***(-1.49)***	***0.039***	***(0.23)***	***-0.651****	***(-1.70)***
Cash Holding	0.246**	(2.06)				
Altman Z-Score	-0.124***	(-3.00)	-0.145	(-1.58)	-0.169***	(-2.95)
Leverage	-0.014**	(-2.12)	-0.018***	(-2.75)	-0.102**	(-2.39)
MTB	0.008	(0.68)	-0.036	(-1.59)	-0.008	(-0.41)
PB	0.003	(1.49)	0.044**	(2.37)	-0.001	(-0.45)
Size	0.087	(0.50)	0.479***	(2.70)	-0.370	(-1.42)
ROA	0.026	(1.20)	0.015	(0.86)	0.062	(1.12)
Loss	-0.057	(-0.13)	-0.206	(-0.49)	0.006	(0.01)
Funding	-0.017***	(-2.64)	-0.016*	(-1.90)	-0.004	(-0.49)
_cons	11.588***	(6.23)	8.610***	(4.58)	20.084***	(10.32)
FE Year	Included		Included		Included	
FE Industry	Included		Included		Included	
N	357		207		150	
Adj. R^2	0.10		0.20		0.16	

This table presents the results of the OLS estimation for H1, H2, and H3, with the inclusion of strategic report specificity (SRS) as a substitute for pension information specificity (PIS). The regression analysis examines the association between SRS and unionisation measured by trade union density while controlling for various firm and pension plan characteristics such as firm size, market-to-book ratio, leverage, return on assets, and funding ratio. Additionally, year and industry fixed effects are included in the regression, and the standard errors are adjusted for heteroskedasticity and serial correlation and are clustered at the firm level.
The number in parentheses represents the t-test value.
***, **, and * denote the statistical significancy at 1%, 5%, and 10%, respectively.
All variables are defined in Table 3.4

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[8] In untabulated additional analysis for using strategic report specificity instead of pension information specificity as an alternative measure for disclosure transparency using a pooled specification and include an interaction, i.e., Unionisation X Cash holdings (Cash holding is defined as a dummy above/below the median value, the results shows that co-efficient of the interaction is statistically significant consistent with the main analysis

3.5.4.2 Alternative firm-level classification for the effect of trade unions on the asymmetric disclosure using Altman's Z-Score for financial distress.

The relationship between wages and employee benefits is a critical aspect of the negotiation process between trade unions and employers. Previous literature has explored the interaction of finance and labour and highlighted the impact of firms' financial conditions on labour negotiations (Benmelech et al., 2012; Klasa et al., 2009; Matsa, 2010). Specifically, Benmelech et al. (2012) found that firms with underfunded pension plans tend to reduce wages during financial distress periods to acquire concessions from employees whose pension plans are underfunded. This, in turn, can weaken the bargaining position of trade unions, allowing management to use the underfunded pension plans as a means of extracting greater concessions from trade unions.

In light of the aforementioned findings, this additional analysis aims to investigate the role of a firm's financial distress, as an alternative measure of cash holding, in the relationship between trade unions and pension information quality. Specifically, this study examines whether trade unions of financially distressed firms can influence the level of pension information specificity. The sample is divided into two subsamples based on the level of financial distress, using Altman's Z-score threshold (low financial distress >3 and high financial distress = <1.8).

Table 3.11, column 1, shows that unionisation is positively associated with the level of pension information specificity in low-distressed firms (with a coefficient of 1.850, statistically significant at a 5% level). Column 2 shows that firms' unionisation is positively associated with pension information specificity in financially distressed firms. These results suggest that the level of financial distress can impact the disclosure strategy in firms facing strong trade unions and that firms' unionisation improves the pension information specificity in less distressed firms. These findings are consistent with the main analysis, which indicates that firms in good

financial positions are more transparent and provide more detailed disclosure when unionisation is high[9].

Table 3.11 Additional Test: Unionisation and PIS - the Role of Firm Financial Distress.

	(1)		(2)	
	Safe Zone Altman's Z-Score above 1.8		Distress Zone Altman's Z-Score equal to or below 1.8	
Unionisation	***1.850*** **	***(2.45)***	***0.758***	***(0.95)***
SRS	1.056*	(1.85)	0.534*	(1.90)
Leverage	-0.058**	(-2.21)	0.046**	(2.25)
MTB	-0.100	(-1.18)	-0.090	(-1.29)
PB	-0.011	(-1.47)	-0.024	(-0.40)
Size	-2.380***	(-3.27)	-1.692**	(-2.09)
ROA	0.113	(0.81)	0.182**	(2.27)
Loss	6.245***	(3.63)	0.137	(0.11)
Funding	0.066*	(1.67)	0.085**	(2.51)
_cons	-6.791	(-0.51)	0.962	(0.12)
FE Year	Included		Included	
FE Industry	Included		Included	
N	167		190	
Adj. R^2	0.27		0.36	

This table presents the results of an OLS estimation that examines the relationship between pension information specificity and trade union density while controlling for various factors. The sample is divided into three subsets based on the level of financial distress, as determined by the Altman Z-score threshold. The subsets are: "Safe Zone" (low financial distress > 1.8) and "Distress Zone" (financial distress = < 1.8). The regression includes year and industry-fixed effects, and the standard errors are adjusted for heteroskedasticity and serial correlation and clustered at the firm level.
The number in parentheses represents the t-test value.
***, **, and * denote the statistical significancy at 1%, 5%, and 10%, respectively.
All variables are defined in Table 3.4

[9] In untabulated additional analysis for using Altmen Z-score for level of financial distress as an alternative measure of firms' cash holding using a pooled specification and include an interaction, i.e., Unionisation X Z-score (Z-Score is defined as a dummy above/below the Z-score threshold 1.8, the results shows that co-efficient of the interaction is statistically insignificant.

3.5.5 Endogeneity concern

There is a potential endogeneity concern in the model between the level of unionisation and pension information specificity. The implementation of firms' fixed effect removes the omitted time-invariant firm characteristics that could potentially cause a correlation between unionisation rates and pension information specificity. The results of all fixed effect regression models are in line with the main findings and confirm the robustness of the main results. The level of unionisation among firms is highly variable and depends on the number of employees who are members of trade unions. To address the possibility of an endogeneity problem, this study uses the instrumental variable (IV) technique with two-stage least squares (2SLS), using the workforce and their engagement as a mechanism that captures unionisation power. The level of workforce engagement is a fundamental element in the trade unions' agenda. In this study, the relevance and exclusion conditions are satisfied by using the workforce engagement score (*WFE*) as the instrumental variable[10]. Firms with a higher level of workforce engagement tend to be more aligned with the trade unions' demands. However, it is unlikely that the discussion of disclosure quality and quantity would be affected by the level of engagement with the firm's workforce.

Table 3.12 present the results for the IV estimation to address potential endogeneity. The results shows that the two stages of regression that workforce engagement (WFE) is positively associated with the level of pension infromaiton specificity(PIS) (the corresponding coefficient for the instrumented Pension_Actu._Disc. variable is 2.950) and is statistically

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[10] Several instrumental variables have been adopted to overcome the endogeneity issue. Prior literature document that the power of trade unions can be demonstrated by the political connection between the location of the head office and whether the ward elected a Labour MP from the UK Parliament website (https://members.parliament.uk/members/commons). Data has been manually collected for each Labour MP and their ward, then mapped to the location of each firm's head office. There is a significant association, but the results show that it is a weak instrumental variable. Another instrumental variable was used for the level of donation to the Labour Party (see Appendix 3.5), but the results (not presented in tabular form) remain the same, indicating a weak instrumental variable.

significant at 10% level), which is consistent with the results obtained using the OLS estimation which support the first hypothesis. Additionally, the tests used to establish the strength the instrument variable, and the Kleibergen-Paap Wald F-statistic exceeds critical value which suggests that the instrument is not weak.

Table 3.12 Instrumental variable analysis for endogeneity

	2SLS	
Unionisation	***2.950****	***(1.67)***
SRS	0.688***	(3.53)
Cash Holding	-0.520	(-1.03)
Altman Z-Score	0.175	(0.69)
Leverage	0.013	(0.54)
MTB	-0.102	(-1.56)
PB	-0.011	(-0.85)
Size	-2.640***	(-3.05)
ROA	0.133*	(1.86)
Loss	-0.376	(-0.24)
Funding	0.070***	(3.56)
cons	-1.047	(-0.22)
FE Year	Included	
FE Industry	Included	
N	357	
Adj. R^2	0.30	

This table presents the result of IV estimation using an instrumental variable approach between the pension information specificity and the instrumental variable is workforce engagement (WFE), controlling for various firm characteristics and performance indicators. The regression model includes year and industry fixed effects, and standard errors are adjusted for heteroskedasticity and serial correlation, as well as clustered at the firm level.
The number in parentheses represents the t-test value.
***, **, and * denote the statistical significancy at 1%, 5%, and 10%, respectively.
All variables are defined in Table 3.4

Weak instrument test	
F-test	18.86
Critical value	16.38
Endogeneity test	
Durbin-Wu-Hausman test	0.87
p-value	0.35

3.5.6 Sensitivity analysis

To ensure the robustness of the results presented in the main findings, a series of sensitivity tests were conducted. Table 3.13 presents the results of these tests. Previous year funding ratio may influence the current year disclosure about the defined benefit plan; thus,

further analysis is to eliminate any potential skewing of the results due to the funding ratio in previous years. To accomplish this, as shown in columns 1, 3, and 4, funding ratios for t-2 and t-1 were collected, and dummy variables were utilized to identify firms with significant changes in funding ratios (i.e., a minimum of a 10% increase or decrease in funding ratio relative to t-2 and t-1) (Almaghrabi et al., 2020). Additionally, to ensure that the main results were not influenced by omitted variables, the main models in Equation (1) and Equation (2) were re-estimated after incorporating and/or substituting control variables. Specifically, firm-specific variables such as corporate governance mechanisms, the number of financial analysts, and defined benefit pension plan-specific controls such as *Equity%* were included in the analysis as shown in Table 3.13 Columns 2, 5, and 6[11].

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11 In untabulated additional analysis using a pooled specification and include an interaction, i.e. Unionisation X Cash holdings (Cash holding can be defined as a dummy above/below the median value, to factors such as previous year funding ratio and corporate governance mechanisms that may influence the disclosure about the defined benefit plan. The results shows that co-efficient of the interaction is statistically insignificant.

Table 3.13 Sensitivity analysis regressions

	(1)		(2)		(3)		(4)		(5)		(6)	
	H1				H2				H2			
	Baseline Model				High Cash Holding		Low Cash Holding		High Cash Holding		Low Cash Holding	
Unionisation	***1.329****	***(2.10)***	***1.374****	***(2.01)***	***2.119*****	***(3.06)***	***0.342***	***(0.29)***	***2.248*****	***(3.17)***	***0.358***	***(0.31)***
SRS	0.610**	(2.59)	0.595**	(2.59)	0.542	(1.30)	0.668**	(2.62)	0.564	(1.33)	0.584**	(2.54)
Cash Holding	-0.187	(-0.33)	-0.071	(-0.13)								
Altman Z-Score	-0.013	(-0.07)	-0.076	(-0.42)	1.103**	(2.35)	-0.235	(-1.11)	0.978*	(1.87)	-0.300	(-1.58)
Leverage	0.022*	(1.70)	0.010	(0.64)	0.008	(0.24)	-0.040	(-0.23)	-0.008	(-0.20)	-0.080	(-0.38)
MTB	-0.075	(-1.11)	-0.075	(-1.04)	0.028	(0.43)	-0.120	(-1.66)	0.019	(0.26)	-0.094	(-1.08)
PB	-0.012	(-1.57)	-0.011	(-1.61)	0.094	(0.97)	-0.002	(-0.55)	0.109	(0.97)	-0.004	(-0.85)
Size	-2.001***	(-2.99)	-1.853*	(-1.88)	-2.523***	(-3.63)	-1.499	(-1.46)	-1.731	(-1.32)	-2.958*	(-1.70)
ROA	0.133*	(1.71)	0.102	(1.28)	0.068	(0.63)	0.156	(0.78)	0.084	(0.69)	-0.069	(-0.36)
Loss	-0.422	(-0.28)	-0.227	(-0.15)	0.527	(0.27)	0.105	(0.04)	1.256	(0.59)	-1.974	(-0.87)
Funding	0.073***	(2.72)	0.061	(1.51)	0.102**	(2.61)	0.039	(0.84)	0.114**	(2.00)	-0.010	(-0.17)
FR_t-1	-1.523	(-1.35)			-1.396	(-0.93)	-0.498	(-0.30)				
FR_t-2	0.440	(0.46)			-0.134	(-0.11)	0.791	(0.54)				
Board size			-0.704*	(-1.97)					-0.564	(-1.13)	-0.514	(-0.99)
Board_ID%			-0.020	(-0.30)					0.000	(0.00)	-0.090	(-0.97)
Board_FEMALE%			0.058	(0.91)					0.062	(0.83)	0.135	(1.55)
Ac_ID%			-0.012	(-0.07)					-0.184	(-0.94)	0.102	(0.77)
Ac_MEET			0.126	(0.32)					0.177	(0.41)	-0.475	(-0.48)
Ac_SIZE			1.052**	(2.17)					0.890	(1.58)	0.555	(0.64)
No.Analysts			0.001	(0.34)					-0.001	(-0.80)	0.004	(1.39)
Pension_Equity%			0.033	(0.98)					-0.010	(-0.19)	0.083*	(1.94)
_cons	-0.206	(-0.03)	-0.967	(-0.05)	-7.007	(-0.81)	-3.117	(-0.31)	4.202	(0.21)	8.664	(0.45)
FE Year	Included		Included		Included		Included		Included		Included	
FE Industry	Included		Included		Included		Included		Included		Included	
N	357		357		207		150		207		150	
Adj. R^2	0.33		0.34		0.32		0.40		0.32		0.46	

This table presents the results of sensitivity analysis for the additional control variables and the effect of prior years' plan funding. The regression includes year and industry-fixed effects, and the standard errors are adjusted for heteroskedasticity and serial correlation and clustered at the firm level. The number in parentheses represents the t-test value. ***, **, and * denote the statistical significancy at 1%, 5%, and 10%, respectively. All variables are defined in Table 3.4

3.6 Conclusion

Prior studies show that there is a complex relationship between firms and their salient stakeholders, particularly employees and their unionisation level, in terms of firms' disclosure strategies (Blankespoor et al., 2020; Hilary, 2006; Verrecchia, 1983). While it can be argued that firms work for the interest of their workforce and therefore provide detailed disclosure to enhance their decision-making, others may believe that higher unionisation rates may lead to rent-seeking behaviour to extract higher benefits. Thus, firms are expected to facilitate information asymmetry and reduce information flow to curb rent-seeking behaviour and weaken collective bargaining during negotiations (Chung et al., 2016; Hilary, 2006; Scott, 1994; Verrecchia, 1983). This study examines whether increased unionisation affects the reporting behaviour of managers regarding one of the most important employee benefits: the pension scheme. Specifically, this study tests whether the level of trade union density is associated with the pension information specificity and how this relationship may be affected by firm-specific characteristics such as cash holding.

The findings indicate that firms with higher levels of unionisation rates are more likely to provide more specific pension information. These findings support the view of stakeholders' salience that firms disclose high-quality disclosure about their employees' benefits when the unionisation rate is high suggesting that trade unions are powerful stakeholders, and firms should align and strengthen the trust relationship. Moreover, the study further documents that firms with high cash-holding disclosure are more precise in pension disclosure when the unionisation rate is higher. This finding implies that firms with abundant financial resources may be more inclined to provide detailed information about their pension schemes to employees represented by trade unions. This is likely due to firms recognising the benefits of sharing such information, as it can help foster positive relationships with employees and enhance their negotiation standing with trade unions. Moreover, firms may also improve the

quality of pension information disclosure to mitigate the negative consequences and proprietary costs associated with poor disclosure that may arise from trade unions. For example, strikes may be less likely to occur if employees have access to accurate and transparent information about their pension schemes. In addition, providing detailed information about pension schemes may also enhance the trust and loyalty of employees towards the firm.

The study further investigates the use of strategic report specificity as an alternative proxy to measure information specificity. The findings indicate that firms tend to report less specific information in their entire strategic report, suggesting that firms adopt various reporting strategies when facing salient stakeholders, such as trade unions. The results imply that management may selectively disclose information based on the perceived power of stakeholders, highlighting the importance of considering the role of stakeholder pressure in shaping corporate disclosure practices.

The study has implications for various stakeholders, including managers, employees and their representatives, and investors. The findings demonstrate the impact of unionisation on corporations, potentially exacerbating information asymmetry. Employees and their representatives need to be aware that managers may respond to their demands for better employment benefits and rent-seeking behaviour by exercising discretion in their narrative disclosure of fundamental elements of benefits, such as employees' pensions. In contrast, investors may find useful information for their portfolio selection by understanding that firms with stronger unionisation and higher cash holdings may follow different disclosure strategies.

This study is naturally subject to several limitations. First, the sample covers publicly listed companies on the London Stock Exchange, and the results may not be generalisable to other contexts, which is a common practice for studies that examine a single context (Dyer et al., 2017). Second, the study measures the power of unionisation by considering union density

at industry level, which might not entirely represent the strength and influence that heightened unionisation potentially carries. A further study using firm-level measures of the unionisation rate would be ideal to overcome this limitation. Third, the study tests the relationship between trade union density and pension information specificity, but it ignores other factors that may influence a company's decision to disclose specific information about their pension plans such as legal and political factors on firms' disclosure strategies. A cross-country study may provide insights into understanding the impact of political connections and the influence of labour parties on firms' decisions.

Chapter 4: Pension information specificity and credit rating decisions: Evidence from the UK strategic report

ABSTRACT

Purpose

Given the nature and size of pension commitments as a source of financial risk and liabilities, this study focuses on the pension information specificity published in the strategic report and whether it affects CRAs' decisions. It also examines whether and how pension information specificity influences credit rating disagreement between CRAs.

Design/Methodology/Approach

The study relies on automated content analysis to evaluate the specificity of defined benefit pension plan information extracted from strategic reports. Using a sample of 357 firm-year observations of listed firms in FTSE350 from 2017 to 2019 to examine the association between pension information specificity and credit rating and rating disagreement.

Findings

There is a significantly negative association between the level of pension information specificity in the firm's strategic report and credit ratings decision, suggesting that higher pension information specificity is associated with a lower credit rating or downgrading. There is also evidence that greater pension information specificity reduces rating disagreement, particularly when the ratings are two notches or higher. Additionally, the study reveals that pension-related qualitative information significantly mitigates credit rating disagreements compared to quantitative information. Various robustness tests confirm these results. Overall, the results demonstrate the impact of pension information quality in a strategic report on credit rating and reducing rating disagreement across rating agencies.

Originality/Value

This study contributes to an understanding of the benefits of strategic report information (pension disclosure) for credit rating assessments. Pension information contained in the strategic report informs both short-term credit assessments (in evaluating default risk) and long-term credit outlooks. The findings also highlight how the quality of disclosure (specificity) mitigates credit rating disagreements. Lastly, the incremental relevance of pension information in the strategic report is noted, in that while credit ratings can be consistent based on current pension plan performance, they do diverge when pension information is not sufficiently specific.

Keywords

Credit ratings; credit rating disagreement; Narrative disclosure; Pension information; Textual specificity.

4.1 Introduction

Credit rating agencies (CRAs) play a crucial role in financial markets by assessing the creditworthiness of firms, thereby reducing information asymmetry between investors and corporations (Lovo et al., 2022; Tang, 2009). Therefore, understanding the factors that influence the credit assessment process is of utmost importance. The credit assessment process typically begins with the incorporation of quantitative information (referred to as hard information), which is based on financial ratios, statistics, and information from financial statements (Akins, 2018; Bloomfield & Fischer, 2011; Bonsall et al., 2017; Ederington, 1986; Kim & An, 2021; Morgan, 2002). Subsequently, CRAs make adjustments to the initial assessment by incorporating qualitative information (known as soft information) from alternative sources (Bonsall & Miller, 2017; Hájek et al., 2017; Hilscher & Wilson, 2016; Rich et al., 2021) such as interviews, discussions with issuers' management, and press releases, through the application of analytical judgment to assess the entity's financial condition, operating performance, and risk management strategies (S&P, 2022). These adjustments can be considered "soft adjustments" to the assessment model (Fitch, 2022; Moody's, 2019; S&P, 2008, 2014).

The inherently subjective nature of soft adjustments in credit ratings often requires credit analysts to exercise higher judgment and high degrees of discretion, particularly when firms seek ratings from multiple CRAs (Bonsall & Miller, 2017; Bozanic et al., 2022). This subjectivity can arise from the evaluation of qualitative and narrative disclosures, and the quality of these disclosures can play a role in reducing subjectivity and improving the accuracy of rating decisions, leading to lower disagreement among CRAs. Although rating agencies acknowledge the importance of disclosure quality in their rating assessments (S&P, 2008), it

remains unclear which attributes of the disclosure are most significant. Therefore, this study aims to examine the association between more transparent and detailed narrative disclosures and rating decisions as well as rating disagreement. The study postulates that low quality and less transparent narrative disclosure is resulting a higher uncertainty about firms' fundamentals, leading to less informative ratings and greater disagreement between agencies.

Complex disclosure imposes a higher cognitive bias on the information users, and providing high-quality and more transparent disclosure can help alleviate this bias load (Lipe & Salterio, 2002). Given the complexity of pension information and the importance of clear and detailed narrative disclosure on credit rating assessment, firms need to provide detailed and transparent information about their defined benefit plan to reduce uncertainty about their defined benefit plan resulting in lower favourable ratings and greater disagreement. For instance, BP (2017) discussed the impact of its defined benefit pension plan on its credit rating in its strategic report. The company stated that a downgrade in its credit rating could lead to a review of its funding arrangements with the BP pension trustees and could result in other impacts on financial performance, such as reducing capital expenditure or increasing asset disposals. Similarly, BT (2019) noted that concerns over its pension plan and network investments had led to downgrades in its credit rating by S&P and Fitch and that the three main CRAs now rate it Baa2/BBB with a stable outlook. This anecdotal evidence points to the importance of pension information in credit rating assessments leading to a tension that firms may refrain from providing higher-quality information to avoid the risk of a credit rating downgrade (Kearney & Liu, 2014; Slapnik & Lončarski, 2021), but equally, the presence of low-quality information can increase uncertainty and generate unfavourable ratings.

The impact of pension information on defined benefit schemes is far from settled. Previous studies examined the creditworthiness of the defined-benefit pension schemes relying on mandatory quantitative information (Anantharaman & Henderson, 2016; Campbell et al., 2012; Cardinale, 2007; Jin et al., 2006; Rauh, 2006) and disclosures from footnotes (Almaghrabi et al., 2020; Basu & Naughton, 2020; Kalogirou et al., 2021). Just as it an important to re-examine this accounting relationship by using different contexts, it is equally important to examine whether it is unique to the assessment process. In particular, only a few studies have focused on the association between credit rating decisions and disclosure from alternative sources of narrative informational sources such as conference calls (Donovan et al., 2021), MD&A (Choi et al., 2020; Donovan et al., 2021; Mayew et al., 2015), Product and Business expansion Disclosures (He, 2018), and Strategy and the Business Model (SBM disclosures) (Athanasakou et al., 2023), making it unclear whether the credit assessment would reflect the incremental impact of the other sources of information.

Moreover, while previously studied focus on textual attributes such as readability and tone on the rating decision and rating disagreement (Bonsall & Miller, 2017; Hájek et al., 2017; Hilscher & Wilson, 2016; Rich et al., 2021), it is important to understand the impact of providing disclosure narrative with greater details and higher transparency (more specific) on the rating decisions, especially detailed and more specific disclosures can reduce uncertainty and enhance credit analysts' ability to assess pension liabilities, thereby enabling them to estimate the attributes of sponsoring firms' future cash flows. In sum, given the substantial importance and complexity of pension information for CRAs and the limited understanding of the rating process in accommodating the different textual attributes of disclosure from different

sources, it is important to examine the role of providing detailed and highly specific narrative disclosure to the credit rating decision.

Drawing on publicly listed companies in FSTE 350 between 2017 and 2019, yielding a total of 357 firm-year observations. Following Hope et al. (2016) in measuring the *Specificity* seeking to quantify the extent of specific words used in the qualitative information for the defined benefit pension plans in the strategic report. Additionally, following prior literature in measuring the credit rating and rating disagreement (Bonsall et al., 2017; Bonsall & Miller, 2017; Morgan, 2002), using the numeric scale for the credit rating of the main three CRAs (Moody's, S&P and Fitch (as shown in Table 4.1)). *Disagreement* between CRAs is measured as a binary variable that is equal to one if any of Moody's, S&P, and Fitch disagree on their initial credit ratings with any of the other two agencies and 0 otherwise, and *Disagreement_Magnitude* is measured as the absolute differences between rating numbers and ranges from zero, with greater positive values indicating greater rating agency disagreement.

The study first documents a downward trend in disclosing highly specific pension-related disclosure across firms, suggesting that not all firms provide the same level of information quality. Second, the findings show that pension information specificity is negatively associated with credit rating decisions, indicating that companies that provide more specific information about their pension plans tend to receive a lower rating (downgrading), consistent with the belief that detailed and highly transparent disclosure downgrade rating decision rather than upgrade it (Bozanic et al., 2022). Furthermore, the results show that pension information specificity is negatively associated with credit rating disagreement, suggesting that firms that provide more specific pension information about their defined benefit pension plan in their strategic report tend to have lower disagreement between CRAs when

they seek multiple credit rating, potentially because greater specificity improve transparency and minimise uncertainty toward rating decision resulting in lower disagreement between CRAs (Bloomfield & Fischer, 2011; Kim & An, 2021; Bonsall & Miller, 2014).

In additional analyses, first, a small variation between CRAs might just represent differences in the timing of their actions and decisions rather than representing the fundamental changes in CRAs' options on firms' creditworthiness (Bonsall & Miller, 2017; Slapnik & Lončarski, 2021). The results show that *PIS* is negatively associated with credit rating disagreement for two notches or more indicating that CRAs are better able to make informed decisions. Second, the study investigates whether the components of pension information specificity (i.e., quantitative, and qualitative components) may also impact credit rating analysts. These findings suggest that qualitative information may also play a role in influencing the behaviour of credit rating analysts and potentially reducing disagreement between CRAs. Third, the study uses firms' credit outlook as an alternative proxy for credit risk, which reflects the forecast bout potential changes in the credit rating and the direction in the future to be positive, stable and negative (Cantor & Mann, 2007; Agarwal et al., 2016; Martell et al., 2013),). The findings show that *PIS* has a statistically negative association with S&P and Fitch's credit outlook, but a positive association with Moody's credit outlook. This suggests that the pension information specificity affects CRAs differently. Nonetheless, S&P and Fitch share similar results that higher pension information specificity leads to a higher likelihood of a downgrade in credit rating outlook. This is different from Moody's, where higher pension information specificity leads to an upgrade in credit outlook.

This study contributes to the literature in several ways. First, this study extends the determinants of credit rating and rating disagreement, particularly the literature on qualitative

pension-related disclosure as a determinant of rating and rating disagreement. Prior work studies the impact of quantitative pension information and mandatory qualitative disclosure that is based on a set of requirements on the credit rating decision and rating disagreement when firms seek a multiple credit rating (Akins, 2018; Bloomfield & Fischer, 2011; Bonsall et al., 2017; Ederington, 1986; Kim & An, 2021; Morgan, 2002). However, narratives of disclosure also play an important role in credit rating decisions (Bonsall & Miller, 2017; Hájek et al., 2017; Hilscher & Wilson, 2016; Rich et al., 2021). This study suggests that using text specificity as a textual attribute in the credit rating assessment process reduces information asymmetry and uncertainty. This is because text specificity helps to reduce the level of judgment required by credit rating analysts, as the information is presented in a more precise and clear manner. This can lead to less disagreement among rating agencies, as well as a reduction in the level of uncertainty and risk associated with the credit rating decision (Ederington, 1986; Morgan, 2002).

Second, a stream of literature has suggested a link between credit rating decisions and the presence of defined-benefit pension schemes. Such studies rely on mandatory quantitative information (Anantharaman & Henderson, 2016; Campbell et al., 2012; Cardinale, 2007; Jin et al., 2006; Rauh, 2006, p. 200) and disclosures from footnotes (Almaghrabi et al., 2020; Basu & Naughton, 2020; Kalogirou et al., 2021). However, only a few studies have focused on the association between credit rating decisions and disclosure from alternative sources of narrative informational sources such as conference calls (Donovan et al., 2021), MD&A (Choi et al., 2020; Donovan et al., 2021; Mayew et al., 2015), Product and Business expansion Disclosures (He, 2018), and Strategy and the Business Model (SBM disclosures) (Athanasakou et al., 2023). This study departs from prior work by concentrating on pension-related information

from the strategic report as a new source of information that contributes to the credit rating assessment process. This is important to several stakeholders and capital market participants in the credit rating assessment for default risk and access to capital for the important strategic role of pension information for strategic decisions.

Third, the judgment of credit rating analysts is influenced by various aspects of narrative disclosure, including readability (Bonsall & Miller, 2017) and tone (Rich et al., 2021). Lower-quality information and less transparent text may lead to a higher degree of subjectivity and judgment on the part of credit rating analysts, which in turn can result in a greater degree of disagreement among rating agencies. In light of the finding by Hope et al. (2016) on the impact of information specificity on capital market participants, this study extends the evidence with regard to the influence of textual attributes of pension information on the credit rating assessment process. Thus, specificity can capture another aspect of quality in addition to readability and tone (Dyer et al., 2017; Franco et al., 2015; F. Li, 2008; Rich et al., 2021).

Finally, practitioners and regulators have also expressed concerns about the increasing trend of vagueness and decreasing specificity of textual disclosure. This trend raises information asymmetry concerns for disclosures in financial statements (FRC, 2018, 2022; IASB, 2018; SEC, 1998), ultimately affecting decision-making. This study illustrates how the specificity of information within the strategic report can provide a complementary dimension of disclosure quality. Additionally, the results demonstrate how firms use different disclosure strategies across the strategic report which affect the capital markets participants such as CRAs, and users of strategic reports differently.

The remainder of this study is organized as follows. Section 4.2 presents a background and reviews the literature. Section 4.3 presents the theoretical framework and hypotheses.

Section 4.4 discusses the research design. Section 4.5 presents the main results and some additional analysis. Finally, Section 4.6 offers concluding remarks.

4.2 Background and Literature Review

4.2.1 Background on the rating process

The credit rating process seeks to assess the ability and willingness of a firm to fulfil its financial obligations. The significant role of CRAs is to gather and analyse information about borrowers and synthesize it into a rating that can be easily understood by investors. This rating is expressed on a scale, with higher ratings indicating lower risk and lower ratings indicating higher risk (refer to Table 4.1). CRAs are thus seen as intermediaries between issuers and investors, tasked with bridging the information gap between the two and enabling issuers to access debt capital at competitive rates, and investors to supply debt capital with a clearer understanding of risk (Duff & Einig, 2009). Furthermore, CRAs have played a significant role in the global financial markets for several decades and are broadly relied upon by issuers of debt securities, investors, and regulatory bodies such as the SEC in the USA and the Financial Service Authority in the UK. Credit ratings provide capital market participants with information about a firm's bankruptcy and default risk, thus reducing information asymmetry and providing crucial information about a firm's ability to meet its obligations (Binici & Hutchison, 2018; Chen & Cheng, 2013; Kiff et al., 2012).

To assess creditworthiness, there are two accepted philosophies: the through-the-cycle (TTC) philosophy and the point-in-time (PIT) philosophy. The TTC philosophy takes a broader view and considers the economic cycle over a longer horizon, while the PIT philosophy reflects the current information and focuses on a shorter horizon (Slapnik & Lončarski, 2021). CRAs have long debated the approach they should take in incorporating macroeconomic factors in

credit ratings. CRAs have faced criticism for their inconsistency in adopting the cycle approach despite its general adoption (Kiff et al., 2012).

Moreover, CRAs rely on several statistical methodologies to model credit risk. These methodologies identify two sources of information: soft or qualitative information obtained from sources such as annual report narratives and press releases, and hard or quantitative information, such as accounting profit figures, stock returns and volatility (Bozanic et al., 2022; Cantor & Packer, 1995; Choi et al., 2020; Donovan et al., 2021). CRAs typically review the accounting characteristics of the issuer's financial statements to determine whether the ratios and statistics are appropriate to measure performance (i.e., hard information modelling). Following the hard information modelling, the CRAs then proceed to compare the obtained information and ratios to peer groups and a large universe of corporate issuers (Moody's, 2007; Standard & Poor's, 2008) which allows the CRAs to gauge the issuer's performance relative to its peers and other companies in the market.

The next step in the rating process involves the consideration of qualitative information, also known as 'soft information' adjustments (Fitch, 2022; Moody's, 2019; Standard & Poor's, 2014). Dimensions such as management quality, aggressive accounting practices, weak control systems, governance risk, industry structure, and managerial bondholder friendliness (Moody, 2007) are considered. A substantial body of research notes that CRAs also consider narrative features such as sentiment, tone, and forward-looking words in the annual reports as part of their independent risk assessment (Altman et al., 2002; Bozanic et al., 2022; Kuang & Qin, 2013; Shand & Baldassarri, 2021; Shorter & Seitzinger, 2010) to derive additional insights into the creditworthiness of the issuer and to form a more comprehensive picture of the issuer's financial performance. However, the methodologies used to process soft information are

subjective in nature, which may result in differing opinions among CRAs. Thus, while hard information can be obtained from the financial statement and assessed objectively, the consideration of soft information remains a crucial aspect of the credit rating process due to its subjective nature.

4.2.2 Qualitative information and rating decision

Despite the widespread use of credit ratings, the credit rating process has faced criticism and scepticism in the academic and financial community for its narrow focus on financial information and neglect of important non-financial factors such as political and social stability, which could impact a borrower's ability to repay debt (Altman et al., 2002; Forest et al., 2015). Additionally, CRAs primarily rely on quantitative information from financial statements, while non-financial information from alternative sources such as earnings press releases and MD&A - which is a rich information source and may contain strategic information influencing future performance and underlying functions generating financial statements such as accounting policies (Li, 2011) is less examined. For example, previous studies have looked at press releases and MD&A, but strategic reports, which contain relevant strategic information for credit rating assessment, are less structured and allow for more flexibility in disclosure, potentially creating differences across firms due to a lack of standardized information compared to MD&A.

Moreover, while hard information is a cornerstone of the rating process (Akins, 2017; Bierey & Schmidt, 2017; Kim et al., 2013; Livingston et al., 2007; Spiceland et al., 2016), there is an emerging recognition of the importance of the textual attributes of soft information, such as readability, tone, and forward-looking language for the convey information content in respect of firms fundamental and stock reaction, and pension information (Davis et al., 2006;

Davis & Tama-Sweet, 2012; Li, 2008) together with its incremental impact on predicting credit rating (Mayew et al., 2015). As such, credit analysts are expected to incorporate qualitative information in the credit rating assessment to improve the accuracy of the rating decision.

However, there is a lack of studies on the implications of textual attributes of soft information on the rating decision. Further investigation in this area may contribute to reducing subjectivity in assessing soft information and improving the accuracy of predicting default risk and the quality of ratings issued by Moody's, S&P, and Fitch (Basu & Naughton, 2020; deHaan, 2017; Mählmann, 2011). Even though variations in accounting numbers explain a sizable proportion of ratings, they do not fully capture the underlying rating process, as some information relevant to lending and the rating process is qualitative or soft, such as narrative disclosures, and is credit relevant.

4.2.3 Defined benefit pension plan and creditworthiness

Pension information is a fundamental component of annual reports and plays a central role in debt financing (Basu & Naughton, 2020; Kraft, 2015; Almaghrabi et al., 2020). Publicly disclosed pension information is subject to scrutiny from various stakeholders such as investors, unions, and regulators, making it a more credible source of information compared to privately communicated information (Armstrong et al., 2010; Gallagher & McKillop, 2010). Over time, political and public concerns about the financial viability and sustainability of pensions have to continue to grow, particularly in light of fundamental changes to the quality of life (i.e., longer life expectancy), medical advancement, workers' rights, and contracts, leading to inevitable rises in pension liabilities and concerns as to whether pension plans are sufficiently funded to meet future commitments.

Thus, publicly disclosed pension information impacts a firm's future cash flow and funding arrangements to meet the commitment of future funding plans, thereby influencing the CRA's evaluation of its creditworthiness (Chen et al., 2022; Gallagher & McKillop, 2010). Chen et al. (2022) document that pension plans' funding status influences corporate credit risk post-adoption of SFAS No 158, suggesting that pension plan information is value relevant to credit analysts. In addition, Gallagher & McKillop (2010) find that pension accounting disclosure risk is priced in corporate disagreement which supports the view that the market is efficient with regard to pension disclosure. While the main result support that the pension information is priced in corporate credit rating, there is still some variation across countries due to pension protections and requirements. Moreover, pension liabilities are considered to be one of the important inputs in credit rating assessments, and they account for a substantial proportion of firms' book value (Shivdasani & Stefanescu, 2010). Sasaki (2015) finds that pension deficits have a significant impact on sponsoring firms' internal resources. When obligations are not fully funded, firms may have to divert a significant portion of their future cash flows from operating activities to finance their pension obligations as they become due (Chaudhry et al., 2017; Glaum & Giessen, 2009; Wang & Zhang, 2014). This can reduce the capacity of sponsoring firms to repay debt holders and creditors together with a decrease in capital expenditure and future pension contribution (Sasaki, 2015), thereby increasing the likelihood of default (Chaudhry et al., 2017; Rauh, 2006).

Lambert et al. (2007) provide evidence that greater information transparency in the form of detailed and more specific disclosure is expected to reduce uncertainty and information asymmetry and provide a more comprehensive assessment of a firm's financial stability. Hence, funding arrangements and the type of main risk facing the company may limit credit

rating analysts' ability to predict firms' real credit ratings due to less precise disclosure. Even when the pension plan is fully funded, changes in the plan assets may cause fluctuations in the funding status, potentially rendering the sponsoring firm liable to cover the pension obligation if it becomes insufficient to meet the obligation (Chaudhry et al., 2017; Shivdasani & Stefanescu, 2010); thus affecting a firm's creditworthiness (Carroll & Niehaus, 1998; Chen et al., 2022; Wang & Zhang, 2014).

Despite this evidence, the risk and complexity posed by pension obligations and the impact of financial information, especially information about fund arrangements and expectations of future cash flows on creditworthiness, remains a topic of debate (Tsalavoutas et al., 2020). In particular, there is limited research on the impact of varying levels of detail and precision in pension-related information on credit rating judgments, particularly when considering the processing of information. In light of the complexity of pension-related transactions and their significant impact on creditworthiness (Basu & Naughton, 2020; Kraft, 2015), particularly due to their influence on the capital market such as firms' capital structure (Shivdasani & Stefanescu, 2010) and cost of debt (Almaghrabi et al., 2020), one does recognize that firms may have incentives to manage the narrative for pension information, especially when they face weak funding positions (Bauman & Shaw, 2014; Billings et al., 2017).

4.3 Theoretical Framework and Hypotheses Development

4.3.1 Theoretical framework.

Behavioural decision theory (BDT) and signalling theory can provide insights into the potential biases in credit rating analysts' decisions when assessing soft information, such as pension information specificity to conclude soft adjustments.

According to BDT (Tversky & Kahneman, 1973), credit rating analysts are susceptible to psychological biases such as confirmation bias, anchoring bias, and overconfidence bias, which can lead to biased decision-making despite the availability of accurate and complete information. In this regard, credit rating analysts with access to transparent and comprehensive pension information may still be influenced by their pre-existing beliefs or expectations about the company's financial health, leading to a biased credit rating assessment. Therefore, while the transparency and quality of the information disclosed by companies may reduce bias, BDT can still explain how cognitive biases impact credit rating assessment and disagreement.

Furthermore, behavioural biases such as confirmation bias and anchoring bias can result in credit rating disagreements among analysts by causing them to overweigh or underweight certain information based on their preconceived notions or prior experiences. The availability is heuristic, for instance, and can lead analysts to rely on readily available quantitative pension information, such as the level of pension fund assets, without considering the specificity of the information provided in the strategic report. This can result in a less nuanced and comprehensive credit rating assessment. In contrast, confirmation bias can cause analysts to interpret pension information specificity in a way that confirms their pre-existing beliefs about a company's financial health and management expertise. This can lead to a less objective credit rating assessment and contribute to rating disagreement among analysts.

To address biases in credit rating assessments, signalling theory (Spence, 1973) suggests that individuals and organisations can use certain signals to convey information to others (Goldstein & Yang, 2019; Indjejikian, 1991; Skinner, 1994), thereby improving the credibility and reliability of soft information provided by companies. Companies often rely on disclosures to credibly communicate their financial health and management expertise to

external stakeholders (Alduais, 2022; Goldstein & Yang, 2019; Li et al., 2022; Skinner, 1994). This, in turn, reduces information asymmetry and alleviates concerns about the quality of their financial reporting, leading to more accurate credit rating assessments. For instance, a company that discloses specific information about its pension plan, including funding status and expected future contributions, signals to credit rating analysts that they have a responsible approach to managing its employee retirement benefits. This signal can increase the analysts' confidence in the company's financial health and management expertise, ultimately resulting in a higher credit rating assessment. Overall, signalling theory plays a critical role in improving the credibility and reliability of soft information, such as pension information specificity, which is provided by companies, thus leading to more accurate credit rating assessments.

4.3.2 Hypotheses development

4.3.2.1 Hypothesis 1: Pension information quality and credit rating

The hypotheses in this chapter are centred on whether the extent to which credit rating analysts incorporate pension information varies with the level of pension disclosure accuracy and transparency in strategic reports, and if any, the magnitude of the disagreement that arises from these variations. These hypotheses are developed based on the assumption that the market is efficient, and the credit rating analyst makes the best use of the public information. Given the processing costs that are required to extract credit risk-relevant information from disclosure (Loughran & McDonald, 2014; Miller, 2002), the primary assumption is that narrative disclosure is informative and contains valuable information for CRAs, who should pay close attention to firms' performance during valuation.

As the market is assumed to be efficient, the relationship between qualitative disclosure and informativeness of credit rating is stronger for ratings that incorporate such information.

The relationship between narrative disclosure and credit ratings has been a subject of interest for both practitioners and academics. CRAs claim that the level of qualitative disclosure made to the public is considered a key factor in credit rating (Fitch, 2022; Moody's, 2019; Standard & Poor's, 2014). Previous literature suggests that narrative or soft information has an impact on firms' creditworthiness (Bozanic et al., 2022; Bonsall & Miller, 2017; Cantor & Packer, 1995; Slapnik & Lončarski, 2021). This is because soft information is useful for the public and provides more informative insights, reducing information asymmetry (Bonsall & Miller, 2017; DeBoskey & Gillett, 2013; Rich et al., 2021). As a result, the quality of disclosure influences the certainty of information users, such as credit analysts, about firms' performance, including cash flow and investment decisions, which may be viewed as signals by firms. The higher certainty about firms' performance reflects a greater accuracy in credit ratings. This is consistent with the claim that higher disclosure quality decreases uncertainty about credit risk and gives credit analysts greater confidence in the liquidity value of the firm (Akins, 2017; Bonsall & Miller, 2017).

In the context of pension disclosure, the credit risk value relevance of pension information should have a greater impact on creditworthiness, especially when high-quality soft information is available (ACCA, 2009; Chen et al., 2022; Hallman & Khurana, 2015; Choi et al., 2020; Donovan et al., 2021; Mayew et al., 2015; Gallagher & McKillop, 2010). Therefore, it can be predicted that higher-quality pension information, such as funding arrangements and consideration of pension risk as a main risk affecting financial stability (TPR, 2023), will be valued by credit rating analysts in the strategic report, resulting in the incorporation of pension information into risk assessment and leading to more accurate credit ratings for disclosures with high-quality and more transparent pension information. However,

the direction of credit rating changes, whether upgrade, stable, or downgrade, is unclear as high-quality pension disclosure may affect credit rating analysts' perception of the pension information in an uncertain manner. Bozanic et al. (2022) suggest that credit rating downgrades of borrowers who provide more qualitative disclosure are more informative than those of borrowers who do not, particularly in the case of sentiment measures and downgrades rather than upgrades. Thus, the impact of high-quality and more transparent narrative attributes may improve the accuracy of credit rating decisions, regardless of the direction of the rating decision.

The signalling theory framework supports this argument, as it suggests that firms have the incentive to provide high-quality information to signal their creditworthiness to their stakeholders through CRAs. This is because higher information details about firms' strategies serve as a signal of higher quality information (Hope et al., 2016) that gives rise to a lower information asymmetry between the company and CRAs. The reduction in information asymmetry should lead to more accurate credit ratings (Hu et al., 2019; Lovo et al., 2022; Tang, 2009). Based on the existing academic and practical evidence, this study predicts that detailed pension information can be reflected in a more accurate assessment of the creditworthiness of the pension information in the credit assessment. Therefore, the primary hypothesis predicts that higher transparent and detailed disclosure about pension information results in greater informative and accurate credit rating decisions based on lower uncertainty content of the disclosure. This leads to lower uncertainty and more accurate credit ratings. This led to the first hypothesis:

H1: *There is a positive association between the level of pension information quality and creditworthiness.*

4.3.2.2 Hypothesis 2: Pension information specificity and credit rating disagreement.

While hard information is considered a fundamental element for the credit rating assessment due to its lack of subjectivity in evaluating credit risk, there is an emerging importance of soft information to improve the informativeness of credit ratings. CRAs claim to rely on soft information obtained from various sources such as interviews, discussions with issuers' management, and press releases (through applying analytical judgment) to assess the entity's financial condition, operating performance, and risk management strategies (Li, 2008; Davis et al., 2012; Davis et al., 2007; S&P, 2022). Each disclosure provides a different source of credibility that translates into the cost (Kothari et al., 2009), depending on the level of transparency associated with the effort required to process and verify this soft information. Thus, if the soft information is more subjective and less verifiable, it may result in higher disagreement among CRAs, as different CRAs may interpret the information based on different judgments or estimates.

Although higher corporate transparency about strategy is important for assessing creditworthiness, some firms are still reluctant to disclose high-quality information about their strategy. Thakor (2015) found that not all firms disclose information about their strategy and strategic information, which is a fundamental source of soft information, raising concerns about the transparency and accuracy of published information for CRAs. Bauman & Shaw (2014) also found that firms rarely disclose the impact of changes in pension assumptions in their MD&A disclosure, which means that credit rating analysts may not be able to incorporate this critical information into their assessment, resulting in less informative credit ratings that accurately reflect the firm's financial position. This situation may increase disagreement across CRAs.

In this regard, leaning on behavioural decision theory (Tversky & Kahneman, 1973), the lack of uncertainty and transparency in disclosures may influence CRAs through heuristics, biases, and judgmental errors in their credit rating assessments. For example, the availability heuristic, a form of cognitive bias, may lead credit rating analysts to rely too heavily on quantitative, readily available, and comparable information, while ignoring other sources of information (Costa et al., 2017; Hayibor & Wasieleski, 2009; Kliger & Kudryavtsev, 2010; Perera et al., 2020). This can result in less nuanced and comprehensive credit rating assessments that may not accurately reflect a company's financial health and management expertise. Confirmation bias, another cognitive bias, may also come into play, where credit rating analysts interpret information in a way that confirms their pre-existing beliefs or expectations about a company's financial health and management expertise (Amato & Furfine, 2004). Based on this argument, the subjective nature of soft information and uncertainty about the accuracy of pension disclosures, it is expected that lack of high quality and low transparency of pension information may result in lower informativeness of credit ratings. This may lead to increased credit rating uncertainty and subjective judgments from credit rating analysts[12]. The higher processing costs associated with analysing low-quality and less transparent pension disclosures may impact credit rating decisions, potentially resulting in increased subjectivity from CRAs. This practice of higher subjectivity in credit rating decisions may further contribute to an increase in the incidence of rating disagreement between CRAs. This led to the second hypothesis.

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[12] The disagreement can be explained differently. First, lower quality and less transparent disclosure may lead rating agencies to process the same pension information differently (Karpoff, 1986; Kandel and Pearson, 1995). Second, lack of transparency may lead CRAs to focus on different factors or different section within the report due to higher processing cost (Merton 1987; Hirshleifer and Teoh 2003). Thirdly, the magnitude of the disagreement across CRAs subject to the level of uncertainty exist regarding the credit risk (Morgan's, 2002; Ederington, 1986)

H2: *The likelihood and magnitude of disagreement between CRAs increase when pension information quality and transparency decrease.*

4.4 Research Design

4.4.1 Data and sample selection

To address the research hypotheses, the study employs a data set of 357 firm-year annual reports from 119 firms with DB pension plans for FTSE 350 obtained from various sources, including ***annualreports.com*** and firms' websites, for the years 2017 to 2019. The strategic reports and pension information within these reports were manually extracted from the annual reports, while control variables such as financial and performance indicators are obtained from Bloomberg and Thomson Reuters Eikon. The definition of all variables used in the study is provided in Table 4.2.

4.4.2 Measures of credit rating and credit disagreement

In line with prior studies, the measure of credit rating is translated from an alphanumerical format to a quantitative measure across the scale of Aaa/AAA/AAA (on the Moody's, S&P, and Fitch rating scales respectively) are assigned a value of 1, while C/C ratings are assigned a value of 21 (Livingston et al., 2008; Livingston & Zhou, 2010). To measure the rating disagreement, this study follows prior studies in measuring disagreement in initial corporate bonds ratings (Bonsall et al., 2017; Bonsall & Miller, 2017; Morgan, 2002). As shown in Table 4.1, the numeric scale shows the map of each letter rating of the three agencies, where a better rating corresponds to lower numbers. According to this mapping, ***Disagreement*** between CRAs is measured as a binary variable that is equal to one if any of Moody's, S&P, and Fitch disagree on their initial credit ratings with any of the other two agencies and 0 otherwise.

It is equally crucial to consider the magnitude of rating agency disagreement that arises from the level of pension information specificity. Thus, ***Disagreement_Magnitude*** is used as a dependent variable and measured as the absolute difference between each of the three CRAs and the other two agencies at issuance. ***Disagreement_Magnitude*** is measured as the absolute differences between rating numbers and ranges from zero, with greater positive values indicating greater rating agency disagreement.

Table 4.1 Credit rating mapping across the main three agencies

Rating number (fine)	Moody's	S&P	Fitch
1 (Highest credit rating)	Aaa	AAA	AAA
2	Aa1	AA+	AA+
3	Aa2	AA	AA
4	Aa3	AA−	AA−
5	A1	A+	A+
6	A2	A	A
7	A3	A−	A−
8	Baa1	BBB+	BBB+
9	Baa2	BBB	BBB
10	Baa3	BBB−	BBB−
11	Ba1	BB+	BB+
12	Ba2	BB	BB
13	Ba3	BB−	BB−
14	B1	B+	B+
15	B2	B	B
16	B3	B−	B−
17	Caa1	CCC+	CCC+
18	Caa2	CCC	CCC
19	Caa3	CCC−	CCC−
20	Ca	CC	CC
21	C	C	C
Default		SD/D	DDD/DD/D

This table summarizes the credit rating measures applied by the three leading agencies: Moody's, Standard and Poor's (S&P), and Fitch. In the first column, a combined rating number is presented relating to the finer rating categories, and in Columns 2, 3, and 4 a consolidated rating number is presented relating to the broader rating categories.

Table 4.2 Variable Descriptions

Dependant Variables			
Variable	Description	Source/Database	Reference
Disagreement	defined as a binary variable that is equal to one if any of Moody's, S&P, and Fitch disagree on their initial credit ratings with any of the other two agencies and 0 otherwise.	NA	
Disagreement_ Magnitude	Measured as the absolute difference between the ratings and ranges from zero, with greater positive values indicating greater rating agency disagreement	NA	
Independent Variables			
Specificity	The number of entities (locations, people, organisations, currency, percentages, dates, or times) identified by the Stanford Named Entity Recognizer (NER) tool, scaled by the total number of words (see Hope et al., 2016, for more details). This ratio is then multiplied by 100.	Annual reports/Strategic reports. And manually /Computerized generated scores using Python and R	Hope et al. (2016)
Control Variables			
Similarity/ Stickiness	Cosine Similarity = (A · B) / (||A|| * ||B||) Where: (A · B) represents the dot product of vectors A and B. ||A|| represents the magnitude (or Euclidean norm) of vector A. ||B|| represents the magnitude (or Euclidean norm) of vector B.	Annual reports/Strategic reports. And manually /Computerized generated scores using Python and R	(Bonsall & Miller, 2017; Lewis & Young, 2019a; Sebastiani, 2002)
Readability	FOG Index = (Average sentence length + Percentage of words with three or more syllables) * 0.4	Annual reports/Strategic reports. And manually /Computerized generated scores using Python and R	(Bonsall & Miller, 2017)
Sentiment	(Positive - Negative) / (Positive + Negative + None) * 100	Annual reports/Strategic	(Bonsall & Miller, 2017)

		reports. And manually /Computerized generated scores using Python and R	
Length	Total number of words in the section/report	Bloomberg	(Bonsall & Miller, 2017)
Cash Holding	Natural log of cash and cash equivalent at the end of the period	Bloomberg	(Basu et al., 2018; Bonsall & Miller, 2017)
Rent	Rental payments scaled by total assets	Bloomberg	(Basu et al., 2018)
Total Debt/TA	Total debt divided by total assets.	Bloomberg	(Akins, 2018; Basu et al., 2018; Bonsall & Miller, 2017)
Altman Z-Score	A score of financial distress. The firm is in financial distress if the score is below or equal to 1.8, and safe otherwise.	Bloomberg	(Das et al., 2009; deHaan, 2017)
Int_Cov	EBITDA scaled by net interest paid	Bloomberg	(Akins, 2018; Basu et al., 2018)
Size	Natural logarithm of market capitalisation	Bloomberg	(Akins, 2018; Basu et al., 2018; Bonsall & Miller, 2017)
Tangibility	Net property, plant, and equipment scaled by total assets	Bloomberg	(Basu et al., 2018; Akins, 2017)
Profit	EBITDA scaled by sales	Bloomberg	(Basu et al., 2018; Bonsall & Miller, 2017)
Profit Volatility	The standard deviation of PROFIT over the last five years or quarters, or at least the last two years or quarters if insufficient data	Bloomberg	(Basu et al., 2018; Bonsall & Miller, 2017)
Funding%	Percentage of pension plan assets to projected benefit obligation	Bloomberg	(Rauh, 2006)
Equity%	Percentage of equity investment in the defined benefit pension plan.	Bloomberg	

4.4.3 Measure of specificity

This study follows similar procedures adopted by Paper 2/Chapter 3 (see Section 3.4.3 for further details) for measuring the *Specificity* of the text.

4.4.4 Multivariate analysis

4.4.4.1 Hypothesis 1: Pension Information Specificity (PIS) and credit rating decision

To investigate the relationship between the pension information specificity narratives and credit rating decisions made by the three main CRAs: Moody's, S&P, and Fitch. Following Bonsall & Miller (2017), this study employs a pooled ordered logistic regression with standard errors clustered at the firm level, as outlined by Petersen (2009). Industry and year-fixed effects are also included to control for external factors that may influence the results. To test this hypothesis, the following model, using Equation (1), examines the effect of pension information specificity on the credit rating decision.

$$CR_{it} = \alpha_0 + \alpha_1 PIS_{it} + \alpha_2 Controls_{it} + \Sigma\, Year + \Sigma\, Ind + \varepsilon_{it} \quad (1)$$

4.4.4.2 Hypothesis 2: Pension Information Specificity (PIS) and credit rating disagreement

Following previous literature, this study examines the impact of pension information specificity on credit rating disagreement using Equation (2) and Equation (3) and measures the disagreement magnitude between CRAs for the same firms using Equation (4).

$$Disagreement_{it} = \alpha_0 + \alpha_1 PIS_{it} + \alpha_2 Controls_{it} + \Sigma\, Year + \Sigma\, Ind + \varepsilon_{it} \quad (2)$$

$$Disagreement\_Magnitude_{it} = \alpha_0 + \alpha_1 PIS_{it} + \alpha_2 Controls_{it} + \Sigma\, Year + \Sigma\, Ind + \varepsilon_{it} \quad (3)$$

$$Disagreement\_Magnitude_{it} = CR_{itx} - CR_{ity} \quad (4)$$

In this study, the concept of credit rating disagreement is operationalized in two ways. Firstly, it is operationalized as an indicator variable (*Disagreement*), with a value of 1 assigned in the case of a disagreement in the initial credit rating decision made by CRAs such as Moody's, S&P, and Fitch, and a value of 0 assigned otherwise using Equation (2). Secondly, to quantify the disagreement between CRAs (*Disagreement_Magnitude*). The magnitude of the disagreement between the CRAs is also considered and defined as the absolute difference between the ratings (i.e., 0, 1, 2, 3+). The study includes both industry and year-fixed effects and employs heteroskedasticity-consistent standard errors in the regression estimations.

To estimate the relationship between pension information specificity and rating agency disagreement, logit and ordered logit models are utilized. The logit model is used when Disagreement is the dependent variable, while the ordered logit model is employed when *Disagreement_Magnitude* is the dependent variable. Both industry and year-fixed effects are included in the regression estimations, and heteroskedasticity-consistent standard errors are employed.

4.4.5 Control variables

Given the primary interest is the effect of pension information specificity on both rating levels and rating agency disagreement, following the prior literature, this study employs control variables to account for a variety of factors that may affect these relationships.

This study controls for firm-level accounting Following prior studies on voluntary disclosure generally and pension disclosure specifically: specificity of the entire strategic report (*SRS*) (Hope et al., 2016), firm size (*Size*) (Watts & Zimmerman, 1986), Market to Book ratio (*MTB*) (Hamm et al., 2018; Hope et al., 2016), leverage (*Leverage*), return on assets (*ROA*), and dummy variable in case the firm has loss at the end of the accounting period (*Loss*), credit rating, (*Rating*). Besides, control variables for pension plan performance have been included such as the Funding ratio (Rauh, 2006) and Equity%. Among control variables, interest cover ratio (*Int_Cov*), *ROA*, and *Rent* are expected to have a negative association with the disagreement, whereas *Leverage* and *MTB* are expected to associate positively with the disagreement. The impact of firm size on credit rating disagreement is unclear, as larger firms are likely to have better information transparency which leads to less uncertainty, but larger firms are likely to have more complex operations and reporting.

While the current study aims to examine the effect of pension information specificity on credit ratings and rating disagreements, an additional set of variables is added to measure other relevant textual attributes that could potentially influence CRAs. For instance, Hoberg & Lewis, (2017) and Lewis & Young (2019) established a link between firms' disclosure similarity framework and accounting fraud, earning guidance, or initial public offering under-pricing. This study measures the similarity across documents using the Cosine Similarity measure developed by Sebastiani (2002), which converts documents into vectors that represent the frequency of each word in the corpus. Furthermore, the study examines the impact of text readability, as prior studies have shown that less readable financial disclosures are associated with less favourable ratings and greater rating disagreement (Bonsall & Miller, 2017). To measure text readability, this study follows the methodology outlined by Li (2008) and uses

the Fog index. Additionally, prior research provides evidence for the significance of different textual sentiments in improving the accuracy of rating decision classifications, such as downgrades and upgrades (Bergman & Roychowdhury, 2008; Kearney & Liu, 2014; Slapnik & Lončarski, 2021). In line with the work of Kearney & Liu (2014) and Loughran & Mcdonald (2011), this study employs a dictionary-based approach using the LM financial dictionary by Loughran & Mcdonald (2011) to focus on positive and negative sentiment categories. Finally, the study also investigates the impact of the length of textual disclosures on users' risk perceptions and their confidence in their predictions regarding future performance (Campbell et al., 2014; Cazier & Pfeiffer, 2015; Dyer et al., 2017; Kravet & Muslu, 2013; Li, 2008).

4.5 Results

4.5.1 Descriptive statistics

Table 4.3 presents the descriptive statistics for the sample of dependent and independent variables. The mean and median values for disagreement obtained by the sample firms are reported. Approximately 60% of the sample exhibits credit rating disagreement between CRAs when obtaining credit ratings from more than one credit rating agency. The average credit rating for the Moody's, S&P, and Fitch are 8.72, 8.69, and 8.82 respectively, which is approximately between Baa1 (BBB+) and Baa2 (BBB) on Moody's (S&P and Fitch) letter scale. Moreover, the disagreement magnitude is approximately one notch, on average (0.94).

Furthermore, the standard deviation for Pension Information Specificity and Strategic Report Information Specificity are 8.37 and 2.27, respectively, showing substantial variation in pension information across firms and within the firm's strategic reports. This result aligns with prior findings by Almaghrabi et al. (2020) and supports the main hypotheses by demonstrating that CRAs are faced with varying levels of pension information that could

impact their creditworthiness assessments. Furthermore, Table 4.4 presents the Pearson correlation matrix for the key variables. PIS shows a positive but insignificant association with credit rating.

Table 4.3 Summary statistics – full sample

Variable	N	Mean	S.D.	Min	Median	Max
Moody's	120	8.72	2.47	3.00	9.00	17.00
S&P	144	8.69	2.22	4.00	9.00	16.00
Fitch	117	8.82	2.34	4.00	9.00	16.00
Disagreement	132	0.58	0.49	0.00	1.00	1.00
Disagreement_Magnitude	132	0.94	1.61	0.00	1.00	10.00
PIS	357	13.02	8.37	0.00	14.34	40.00
SRS	357	11.43	2.27	6.85	11.18	34.35
Similarity	357	0.07	0.04	0.00	0.08	0.15
Readability	357	14.98	7.74	0.40	17.73	33.36
Sentiment	357	0.08	1.65	-6.17	0.00	10.00
Length	357	4.39	2.34	0.00	5.34	7.59
Cash Holding	357	12.45	1.71	7.17	12.23	17.10
Rent	357	0.02	0.04	0.00	0.01	0.41
Total Debt/TA	357	0.24	0.16	0.00	0.25	0.92
Altman Z-Score	357	4.50	4.25	-0.68	3.71	39.96
Int_Cov	354	44.96	259.92	-2734.61	12.06	2026.00
Size	357	3.65	0.67	2.56	3.60	5.61
Tangibility	357	0.27	0.25	0.00	0.19	0.97
Profit	357	20.28	16.99	-44.22	16.69	137.74
Profit Volatility	357	5.22	11.52	0.00	2.12	100.18
Funding%	357	92.29	23.73	0.00	97.26	131.98
Equity%	357	22.17	18.05	0.00	20.54	99.25

PIS(%): The ratio of pension information-specific words in the strategic report, as a proportion of all pension information words in the strategic report, excluding stop words.
SRS(%): The ratio of specific words in the strategic report, as a proportion of all words in the strategic report, excluding stop words.

Table 4.4 Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
(1) PIS	1.00																					
(2) Moody's rating	0.06	1.00																				
(3) S&P rating	0.03	0.94*	1.00																			
(4) Fitch rating	0.00	0.94*	0.94*	1.00																		
(5) Disagreement	0.01	-0.11	-0.15	-0.09	1.00																	
(6) Disagreement_Magnitude	-0.02	0.07	-0.10	0.03	0.50*	1.00																
(7) SRS	0.08	-0.03	-0.02	-0.09	0.02	0.03	1.00															
(8) Similarity	0.70*	0.11	0.05	-0.03	-0.06	0.06	-0.09	1.00														
(9) Readability	0.61*	-0.02	-0.08	-0.10	0.01	0.07	0.00	0.66*	1.00													
(10) Sentiment	0.06	0.22*	0.14	0.13	0.14	0.01	0.02	-0.03	0.03	1.00												
(11) Length	0.66*	0.01	0.00	-0.10	-0.07	0.06	-0.06	0.86*	0.87*	-0.04	1.00											
(12) Cash Holding	-0.13*	-0.62*	-0.61*	-0.67*	0.04	-0.00	0.02	-0.19*	-0.05	-0.09	-0.11	1.00										
(13) Rent	0.06	0.12	0.12	0.07	0.19	0.20	0.00	0.12	0.10	0.07	0.14*	-0.01	1.00									
(14) Total Debt/TA	-0.15*	-0.06	0.06	0.16	0.25*	0.08	-0.07	-0.16*	-0.03	-0.08	-0.08	0.03	-0.07	1.00								
(15) Altman Z-Score	-0.05	0.07	-0.10	0.01	0.09	-0.00	-0.09	-0.08	-0.16*	0.08	-0.15*	-0.24*	0.05	-0.07	1.00							
(16) Int_Cov	0.01	0.06	0.06	-0.11	-0.11	-0.10	-0.05	0.00	0.01	-0.08	0.02	-0.01	0.01	-0.15*	0.22*	1.00						
(17) Size	-0.23*	-0.68*	-0.64*	-0.69*	0.05	-0.00	0.06	-0.25*	-0.12*	-0.13*	-0.18*	0.83*	-0.14*	0.21*	-0.29*	-0.10	1.00					
(18) Tangibility	-0.15*	-0.22*	-0.07	-0.16	0.12	0.18	0.07	-0.07	-0.14*	-0.05	-0.10	-0.07	0.02	0.22*	-0.22*	-0.10	0.15*	1.00				
(19) Profit	-0.21*	-0.04	-0.02	0.02	0.05	-0.10	0.11	-0.23*	-0.27*	-0.02	-0.27*	-0.10	-0.17*	0.27*	0.20*	0.05	0.09	0.41*	1.00			
(20) Profit Volatility	-0.19*	0.03	0.07	-0.08	-0.21*	-0.10	0.13*	-0.24*	-0.25*	-0.03	-0.26*	-0.11	-0.10	0.07	-0.10	-0.00	0.06	0.35*	0.34*	1.00		
(21) Funding%	0.14*	-0.27*	-0.24*	-0.28*	-0.14	-0.20	-0.18*	0.10	0.19*	-0.02	0.16*	0.12*	0.01	-0.12*	0.04	0.04	0.11	-0.16*	-0.19*	-0.10	1.00	
(22) Equity%	0.03	0.05	0.00	-0.15	0.20	0.15	0.06	0.13*	0.03	0.02	0.07	-0.07	0.15*	-0.01	0.19*	-0.10	-0.07	0.05	0.06	-0.10	-0.00	1.00

*, ** and *** indicate significance at the 10%, 5%, and 1% levels.

4.5.2 Multivariate regression

4.5.2.1 Hypothesis 1: Pension information specificity (PIS) and credit rating decision

The results reported in Table 4.5 present findings on the impact of Pension Information Specificity (*PIS*) on the credit rating assessment process by CRAs (i.e., Moody's, S&P, and Fitch). The regression analysis, which models the credit rating decision of the CRAs as the dependent variable and PIS as the independent variable, is reported in columns 1, 2, and 3 at the firm level.

The results indicate a statistically significant negative relationship between the measure of PIS and the credit rating decision. The coefficients for Moody's and Fitch are 0.081 and 0.111, respectively, and are statistically significant at the 5%, and 10% levels. On average, a one-standard-deviation increase in PIS (from the strategic reports) is associated with a decrease in credit rating by 67.7% and 92.9% (8.37 * (0.081 and 0.111), as per Tables 4.3 and 4.5) by one notch for Moody's, S&P, and Fitch, respectively. Therefore, H1 is supported.

These results support the prior literature (ACCA, 2009; Chen et al., 2022; Hallman & Khurana, 2015; Choi et al., 2020; Donovan et al., 2021; Mayew et al., 2015; Gallagher & McKillop, 2010), especially the findings of Bozanic et al. (2022) that higher disclosure quality and increased provision of qualitative information resulted in credit rating downgrade rather than upgrade. These results are consistent with the prediction that firms have an incentive to provide high quality information as a sign of less information asymmetry, signalling their creditworthiness to stakeholders through credit ratings,

In addition to PIS, the results reveal the positive association between other control variables, such as readability of the report (*Readability*), cash holdings (*Cash Holding*), lower

financial distress (*Altman Z-Score*), higher interest coverage ratio (*Interest Cover Ratio*), higher Tangible assets (*Tangibility)*, the higher funding ratio for defined benefit pension schemes (*Funding%*), and lower investment in high-risk asset classes (*Equity%*), and a better credit rating.

Table 4.5 PIS and credit rating (H1)

	(1)		(2)		(3)	
Variables	Moody		S&P		Fitch	
PIS	*0.081***	*(2.07)*	*0.069*	*(1.61)*	*0.111**	*(1.78)*
SRS	0.035	(0.17)	-0.026	(-0.14)	-0.046	(-0.21)
Similarity	-17.069	(-0.70)	-17.788	(-0.97)	-31.709	(-1.21)
Readability	-0.004	(-0.07)	-0.030	(-0.38)	-0.135*	(-1.67)
Sentiment	-0.219	(-1.23)	-0.264	(-1.56)	-0.181	(-1.17)
Length	-0.041	(-0.09)	0.343	(0.77)	0.482	(0.92)
Cash Holding	-0.874	(-1.24)	-1.113***	(-3.47)	-1.054***	(-2.62)
Rent	-38.997*	(-1.78)	44.305*	(1.91)	18.444	(1.27)
Total Debt/TA	-1.520	(-0.40)	2.643	(0.77)	-0.152	(-0.03)
Altman Z-Score	-0.345	(-1.28)	-0.620**	(-2.05)	-0.427	(-1.21)
Int_Cov	-0.099**	(-2.30)	-0.050	(-1.34)	-0.090***	(-3.20)
Size	-1.897	(-1.08)	-0.712	(-0.58)	-2.377	(-1.33)
Tangibility	-8.775***	(-4.10)	-4.333**	(-2.18)	-0.298	(-0.11)
Profit	-0.024	(-0.39)	-0.051	(-1.29)	-0.009	(-0.43)
Profit Volatility	-0.126	(-1.16)	-0.049	(-0.65)	-0.073***	(-2.86)
Funding%	-0.055*	(-1.82)	-0.045**	(-2.11)	-0.041	(-1.03)
Equity%	-0.020	(-0.71)	-0.040	(-1.40)	-0.017	(-0.65)
_cons	32.141***	(12.88)	30.412***	(10.65)	29.617***	(10.42)
FE Year	Included		Included		Included	
FE Industry	Included		Included		Included	
N	120		141		117	
Pseudo R2	0.380		0.307		0.346	

This table presents the results of ordered logistic regression analysis for the relationship between the pension information specificity and credit rating decisions, controlling for various firm characteristics and performance indicators. The regression model includes year and industry fixed effects, and standard errors are adjusted for heteroskedasticity and serial correlation, as well as clustered at the firm level.
The number in parentheses represents the z-statistics value.
***, **, and * denote the statistical significancy at 1%, 5%, and 10%, respectively.

4.5.2.1 Hypothesis 2: Pension information specificity (PIS) and credit rating disagreement

Table 4.6 presents the results for the second hypothesis using equations (2) and (3). Columns 1 and 2 suggest a negative association between the level of pension information

specificity and the likelihood of credit rating disagreement and disagreement magnitude (the corresponding coefficients for *PIS* are -0.067 and -0.052, respectively, and are statistically significant at 5% and 10% level, respectively).

The results indicate a statistically significant negative association between the measure of *PIS* and both the credit rating disagreement and disagreement magnitude. The coefficients for *Disagreement* and *Disagreement_Magnitude* are -0.067 and -0.52, respectively, and are statistically significant at the 1% and 5% levels. On average, a one-standard-deviation increase in the PIS is associated with a decrease in credit rating disagreement and disagreement magnitude by 59.08% and 44.5% (8.37 * (-0.067 and -0.052), as per Table 4.3, and 4.6) by one notch.

The findings of this study suggest a positive response from credit rating analysts to enhanced transparency and detailed, specific disclosure. This implies that an improvement in the quality and transparency of pension information results in increased informativeness of credit ratings. Consequently, this contributes to a reduction in credit rating uncertainty and subjective judgments made by credit rating analysts. These results are also consistent with existing literature, which emphasise on the importance of higher disclosure transparency in providing more informative information for CRAs (Bauman & Shaw, 2014; Thakor, 2015). This contributes to a decrease in credit rating disagreement among CRAs resulting from bias or judgemental error, as the prevalence of inaccurate information is reduced.

Table 4.6 PIS and credit rating disagreement (H 2)

	(1)		(2)		(3)		(4)	
	Disagreement		Disagreement_ Magnitude		Disagreement		Disagreement	
Variables	Logit		OLS		First stage Logit		2SLS OLS	
PIS	***-0.067****	***(-1.68)***	***-0.052****	***(-2.20)***			***-0.092****	***(-1.66)***
CA_TU					***-2.248*****	***(-3.03)***		
SRS	0.250	(1.07)	0.004	(0.06)	0.324	(1.27)	0.103*	(1.85)
Similarity	48.932*	(1.84)	15.419*	(1.90)	74.322**	(2.07)	8.891	(1.59)
Readability	0.085	(0.79)	0.032	(0.81)	0.040	(0.43)	0.039	(1.39)
Sentiment	-0.113	(-0.56)	0.006	(0.07)	-0.104	(-0.42)	0.047	(0.99)
Length	-1.329**	(-1.96)	-0.243	(-1.33)	-1.776**	(-2.36)	-0.150*	(-1.70)
Cash Holding	0.399	(0.79)	-0.098	(-0.75)	0.056	(0.11)	0.068	(1.10)
Rent	82.453***	(3.07)	39.923***	(6.34)	103.660**	(2.57)	6.357**	(2.25)
Total Debt/TA	4.898	(0.92)	0.720	(0.54)	9.729*	(1.67)	0.624	(1.00)
Altman Z-Score	1.156***	(2.80)	0.183**	(2.35)	1.248***	(2.98)	0.166***	(3.62)
Int_Cov	-0.182***	(-2.88)	-0.019	(-1.45)	-0.221**	(-2.56)	-0.013**	(-2.22)
Size	2.097	(1.59)	0.802*	(1.69)	6.934***	(3.16)	-0.108	(-0.40)
Tangibility	-5.189**	(-2.19)	-0.509	(-0.63)	-9.827***	(-2.92)	-0.598	(-1.55)
Profit	0.080	(1.46)	-0.007	(-0.43)	0.022	(0.31)	0.018*	(1.76)
Profit Volatility	-0.242	(-1.41)	-0.001	(-0.04)	-0.279	(-1.28)	-0.014	(-0.91)
Funding%	-0.035	(-1.63)	-0.008	(-1.01)	-0.059***	(-2.67)	0.002	(0.43)
Equity%	-0.064**	(-2.19)	-0.003	(-0.31)	-0.064*	(-1.78)	-0.008*	(-1.67)
_cons	-15.724**	(-2.20)	-0.859	(-0.51)	-12.218*	(-1.95)	-2.304**	(-2.16)
FE Year	Included		Included		Included		Included	
FE Industry	Included		Included		Included		Included	
N	129		129		129		129	
Pseudo R^2	0.478				0.532			
Adj. R^2			0.504				0.560	

This table presents the results of the logistic regression (OLS) model analysis Columns 1, 3, and 4 (Column 2) of the relationship between the pension information specificity and credit rating disagreement and disagreement magnitude, controlling for various firm characteristics and performance indicators. The regression model includes year and industry fixed effects, and standard errors are adjusted for heteroskedasticity and serial correlation, as well as clustered at the firm level.
The number in parentheses represents the z-statistics (t-statistics) value in Columns 1, 3, and 4 (Column 2). ***, **, and * denote the statistical significancy at 1%, 5%, and 10%, respectively.

4.5.3 Additional analysis

4.5.3.1 The impact of pension information specificity on the direction and the level of rating disagreement by notches

The primary result suggests that the pension information specificity may cause rating disagreements between CRAs regardless considering the magnitude and direction of the

disagreement. Although the single-notch disagreements capture observable differences of opinion between CRAs, one could raise a concern that single-notch disagreements are less likely to capture rating agency uncertainty. This is because CRAs have different time duration for processing the latest information, different intervals for reviewing ratings, and different rating policies. Therefore, a small variation between CRAs might just represent differences in the timing of their actions rather than representing the fundamental changes in CRAs' options on firms' creditworthiness. To address the concern that single-notch disagreements may not fully capture rating agency uncertainty and following (Bonsall & Miller, 2017; Slapnik & Lončarski, 2021), the study divided the rating scale into two groups in the analysis: one group with disagreement only at one notch (*OneNotch*) and another group for more than one notch disagreement (*PlusOneNotch*).

The results presented in Table 4.7, column 1, show that the pension information specificity (*PIS*) is positively associated with the credit rating disagreement by one notch. This means that higher levels of specificity in the pension information may result in a slight increase in credit rating disagreement by one notch. However, Column 2 presents a statistically negative association between PIS and credit rating disagreement when disagreement is more than one notch. This result supports the argument that the quality and pension information specificity in the strategic report can have an impact on firms' creditworthiness. The negative relationship between *PIS* and credit rating disagreement for two notches or more indicates that CRAs are better able to make informed decisions. In conclusion, the findings suggest that higher levels of pension information specificity can reduce credit rating disagreement, especially when the disagreement is two notches or more.

Table 4.7 PIS and degree of credit rating disagreement measured by notches

Variables	(1) *OneNotch*		(2) *PlusOneNotch*	
PIS	*0.009*	*(1.02)*	*-0.012****	*(-2.71)*
SRS	0.021	(0.75)	0.019	(1.40)
Similarity	-0.001	(-0.11)	0.002	(0.35)
Readability	-2.674	(-0.90)	3.889**	(2.61)
Sentiment	-0.017	(-0.55)	0.010	(0.67)
Length	-0.018	(-0.27)	-0.049	(-1.43)
Cash Holding	0.026	(0.54)	0.030	(1.23)
Rent	2.994	(1.20)	1.341	(1.07)
Total Debt/TA	0.587	(1.23)	-0.293	(-1.23)
Altman Z-Score	0.088***	(3.16)	0.026*	(1.86)
Int_Cov	-0.010**	(-2.17)	-0.003	(-1.27)
Size	0.131	(0.72)	-0.065	(-0.72)
Tangibility	-0.784***	(-2.71)	0.484***	(3.34)
Profit	0.010	(1.60)	-0.001	(-0.40)
Profit Volatility	-0.016	(-1.30)	-0.005	(-0.74)
Funding%	-0.006**	(-2.12)	0.003*	(1.94)
Equity%	-0.010**	(-2.47)	0.003	(1.52)
FE Year	Included		Included	
FE Industry	Included		Included	
_cons	-0.340	(-0.56)	-0.791**	(-2.61)
N	122		122	
Adj. R^2	0.34		0.40	

This table presents the results of an OLS analysis of the relationship between the pension information specificity and the disagreement magnitude at one notch level in column (1) and more than one notch level in column (2), controlling for various firm characteristics and performance indicators. The regression model includes year and industry fixed effects, and standard errors are adjusted for heteroskedasticity and serial correlation, as well as clustered at the firm level.
The number in parentheses represents the t-test value.
***, **, and * denote the statistical significancy at 1%, 5%, and 10%, respectively.

4.5.3.2 Characteristics of Pension Information Specificity (PIS) and rating disagreement

The current analysis provides evidence of the relationship between the pension information specificity and credit ratings and rating disagreement. However, it is unclear which component of specificity has the greatest impact on the narrative content of pension information in strategic reports. An earlier study by Hope et al. (2016) revealed a positive association between market participants and the quantitative group of specificity. Given this

result, the current study investigates whether the components of pension information specificity may also impact credit rating analysts.

Following Hope et al. (2016), the study categorizes the main seven specificity components into two main groups based on item characteristics, namely the qualitative and quantitative groups. The qualitative group (*Qualitative Score*) includes the Money, Percentage, Date, and Time elements, while the quantitative group (*Quantitative Score*) encompasses the Organization, Person, and Location elements. The results presented in Table 4.8, column 1, shows that the qualitative score exhibits a negative association with rating disagreement, which is statistically significant. However, in column 2, the relationship between the quantitative score and rating disagreement is directionally consistent with the expectations, but it is not statistically significant. These findings suggest that qualitative information may also play a role in influencing the behaviour of credit rating analysts and potentially reducing disagreement between CRAs. In general, the results are in line with the results of Hope et al. (2016).

Table 4.8 PIS characteristics and rating disagreement magnitude

Variables	(1) Disagreement_ Magnitude		(2) Disagreement_ Magnitude	
Qualitative Score	***-9.605****	***(-2.26)***		
Quantitative Score			***-4.080***	***(-1.25)***
SRS	-0.029	(-0.41)	-0.009	(-0.12)
Similarity	9.236	(1.16)	15.418*	(1.78)
Readability	0.022	(0.58)	0.022	(0.55)
Sentiment	-0.014	(-0.17)	-0.005	(-0.06)
Length	-0.137	(-0.74)	-0.268	(-1.41)
Cash Holding	-0.075	(-0.57)	-0.120	(-0.91)
Rent	41.613***	(6.58)	39.327***	(6.12)
Total Debt/TA	0.965	(0.72)	0.511	(0.38)
Altman Z-Score	0.176**	(2.27)	0.168**	(2.13)
Int_Cov	-0.015	(-1.12)	-0.021	(-1.58)
Size	0.680	(1.40)	0.957**	(2.01)
Tangibility	-0.306	(-0.38)	-0.512	(-0.62)
Profit	-0.012	(-0.71)	-0.010	(-0.55)
Profit Volatility	0.003	(0.10)	-0.005	(-0.14)
Funding%	-0.007	(-0.94)	-0.010	(-1.32)
Equity%	0.000	(0.04)	-0.004	(-0.37)
_cons	-0.439	(-0.26)	-0.571	(-0.33)
FE Year	Included		Included	
FE Industry	Included		Included	
N	129		129	
Adj. R^2	0.51		0.49	

This table presents the results of an OLS analysis of the relationship between the pension information specificity components (i.e., qualitative, and quantitative characteristics) and credit rating disagreement, controlling for various firm characteristics and performance indicators. The regression model includes year and industry fixed effects, and standard errors are adjusted for heteroskedasticity and serial correlation, as well as clustered at the firm level.
The number in parentheses represents the t-test value.
***, **, and * denote the statistical significancy at 1%, 5%, and 10%, respectively.

4.5.3.3 Credit outlook as an alternative measure of credit risk.

CRAs offer several products, including credit ratings, credit watches, and rating outlooks in their rating reports, which contain valuable information. For instance, Cantor & Mann (2007) discovered that rating outlook has greater predictive power than credit rating in determining default risk and enhancing rating accuracy. Agarwal et al., (2016) further found that there is a negative relationship between stock returns and rating outlook, suggesting that rating outlook provides supplementary information beyond credit rating changes. In the context

of pension information, previous research has demonstrated that pension-related transactions have a significant impact on creditworthiness (Basu & Naughton, 2020; Kraft, 2015). In particular, Martell et al. (2013) found that the rating outlook is vulnerable to sponsoring defined benefit pension plans, especially their funding ratio.

Building on these findings, this study expands the main analysis to use credit outlook, an alternative proxy for credit risk, which reflects the forecast bout potential changes in the credit rating and the direction in the future to be positive, stable, and negative. Thus, this study examines whether pension information specificity (*PIS*) has a differential effect on credit outlook. To do this, the credit outlook for each firm-year observation was collected and the main regression analysis was replicated, replacing credit rating with credit outlook (*CreditOutlook*). The results in Table 4.9, Panel A, reveal that *PIS* has a statistically negative association with S&P and Fitch's credit outlook, but a positive association with Moody's credit outlook. This suggests that the pension information specificity affects CRAs differently when they look at the stability of the rating decision in the future. Nonetheless, S&P and Fitch share similar results that higher pension information specificity leads to a higher likelihood of a downgrade in credit rating outlook. This is different from Moody's, where higher pension information specificity leads to an upgrade in credit outlook. The findings support the first hypothesis.

Moreover, although the overall results in Table 4.9, Panel B, column 1, indicate that *PIS* has no significant impact on *CreditOutlook*, the impact is statistically significant among individual CRAs. The disagreement in credit outlook is statistically significant and more pronounced between Moody's and both S&P and Fitch (see columns 2, 3, and 4). This disparity may stem from differing interpretations and assessments of the level of specificity provided in

the pension information by each credit rating agency. For instance, one agency may place greater weight on qualitative information (such as Money, Percentage, Date, and Time elements), while another may place more emphasis on quantitative information (such as Organization, Person, and Location elements). These findings partially support the second hypothesis.

Table 4.9 Panel A: PIS and credit outlook (H 1)

Variables	(1) Moody		(2) S&P		(3) Fitch	
PIS	*0.011***	*(2.01)*	*-0.015****	*(-3.16)*	*-0.007**	*(-1.67)*
SRS	-0.028*	(-1.67)	-0.031**	(-2.20)	0.008	(0.71)
Similarity	-2.162	(-1.64)	-0.598	(-0.62)	1.300	(1.59)
Readability	0.004	(0.52)	0.006	(1.15)	0.000	(0.01)
Sentiment	-0.008	(-0.41)	0.032**	(1.99)	0.019	(1.34)
CA_TU	-0.185***	(-3.51)	0.022	(0.67)	0.026	(0.78)
Cash Holding	-0.111***	(-3.24)	0.061**	(2.38)	0.012	(0.49)
Rent	1.501	(1.03)	2.172	(1.17)	-6.764***	(-6.53)
Total Debt/TA	0.071	(0.22)	0.684***	(2.76)	-0.583**	(-2.44)
Altman Z-Score	-0.120***	(-6.94)	-0.075***	(-4.80)	0.001	(0.05)
Int_Cov	0.002	(0.67)	0.012***	(4.83)	0.001	(0.34)
Size	0.362**	(2.52)	-0.409***	(-3.81)	0.048	(0.56)
Tangibility	0.269	(1.40)	0.220	(1.43)	-0.304*	(-1.74)
Profit	0.001	(0.20)	-0.002	(-0.54)	0.003*	(1.93)
Profit Volatility	-0.003	(-0.38)	0.021***	(4.00)	-0.003	(-1.36)
Funding%	0.003**	(2.12)	0.009***	(6.33)	-0.005***	(-3.25)
Equity%	0.002	(0.69)	0.010***	(4.62)	-0.006***	(-3.02)
_cons	1.089***	(2.74)	-0.172	(-0.51)	-0.009	(-0.03)
FE Year	Included		Included		Included	
FE Industry	Included		Included		Included	
N	117		141		105	
Pseudo R2	0.9341		1.136		-40.660	

This table presents the results of the Tobit regression models analysis of the relationship between the pension information specificity and credit rating outlook, an alternative measure of credit risk, controlling for various firm characteristics and performance indicators. The regression model includes year and industry fixed effects, and standard errors are adjusted for heteroskedasticity and serial correlation, as well as clustered at the firm level.
The number in parentheses represents the t-test value.
***, **, and * denote the statistical significancy at 1%, 5%, and 10%, respectively.

Table 4.9 Panel B: PIS and credit outlook disagreement (Hypothesis 2)

Variables	(1) Overall Disagreement		(2) Moody_S&P		(3) Moody_Fitch		(4) S&P_Fitch	
PIS	*0.006*	*(0.87)*	*0.022****	*(2.82)*	*0.025***	*(2.39)*	*-0.008**	*(-1.80)*
SRS	0.049**	(2.57)	0.022	(0.99)	-0.036	(-1.14)	-0.030**	(-2.21)

Similarity	1.783	(1.28)	-4.054**	(-2.27)	-1.066	(-0.38)	0.156	(0.16)
Readability	-0.006	(-0.82)	0.004	(0.51)	-0.003	(-0.25)	-0.001	(-0.11)
Sentiment	0.021	(0.97)	-0.075***	(-2.98)	-0.023	(-0.60)	-0.009	(-0.56)
CA_TU	-0.082	(-1.61)	-0.228***	(-3.19)	-0.474***	(-2.96)	0.084**	(2.13)
Cash Holding	-0.117***	(-3.44)	-0.160***	(-3.53)	0.021	(0.23)	0.080***	(2.83)
Rent	1.339	(0.79)	-5.330**	(-2.20)	24.468**	(2.47)	4.939*	(1.79)
Total Debt/TA	0.552	(1.54)	-1.393***	(-3.24)	3.048***	(3.16)	1.143***	(3.64)
Altman Z-Score	0.025	(1.21)	-0.039*	(-1.78)	-0.166***	(-4.51)	-0.079***	(-5.38)
Int_Cov	0.001	(0.31)	-0.012***	(-3.04)	-0.004	(-0.73)	0.004**	(2.02)
Size	0.296*	(1.91)	0.645***	(3.32)	-0.317	(-0.92)	-0.558***	(-5.11)
Tangibility	-1.139***	(-5.43)	-0.234	(-0.95)	1.809***	(2.68)	1.030***	(5.36)
Profit	-0.007	(-1.48)	0.012**	(2.04)	0.011	(1.04)	-0.006*	(-1.88)
Profit Volatility	0.022**	(2.40)	-0.020*	(-1.92)	0.004	(0.30)	-0.006	(-1.12)
Funding%	-0.001	(-0.50)	-0.002	(-0.75)	0.023***	(4.14)	0.013***	(7.47)
Equity%	0.007**	(2.11)	-0.002	(-0.56)	0.026***	(3.72)	0.003	(1.25)
_cons	1.289***	(2.85)	1.090**	(2.11)	0.377	(0.41)	-0.414	(-1.15)
FE Year	Included		Included		Included		Included	
FE Industry	Included		Included		Included		Included	
N	126		108		78		87	
Pseudo R2	0.465		0.655		0.529		2.112	

This table presents the results of the Tobit regression models analysis of the relationship between the pension information specificity and credit rating outlook disagreement, an alternative measure of credit risk, and Outlook disagreement across CRAs, controlling for various firm characteristics and performance indicators. The regression model includes year and industry fixed effects, and standard errors are adjusted for heteroskedasticity and serial correlation, as well as clustered at the firm level. The number in parentheses represents the t-test value.
***, **, and * denote the statistical significance at 1%, 5%, and 10%, respectively.

4.5.3.4 Strategic report information and credit rating.

Financial disclosure narratives, such as MD&A and Strategic Reports disclosure, have received limited attention despite their importance in providing stakeholders with a firm's plans and growth expectations (Lu & Tucker, 2012). Similar to other voluntary disclosure, firms may exercise a high discretion in narrative disclosure about strategies to their stakeholders. For example, Brown & Tucker (2011) found that modification scores of the MD&A section were positively correlated with stock prices but not with analyst forecasts. Mayew et al. (2015) document that strategic information in the MD&A contains information relevant to credit risk assessment. These findings suggest that the information in the strategic report is expected to reduce credit analyst uncertainty about the firm and reduce rating disagreement between rating agencies, and thus the following text extends the main analysis to examine whether the quality

of the information in the entire strategic report has a similar effect on credit rating analysts and their assessment decision.

To do this, a new score for the Strategic Report Specificity (*SRS*) was created using the same procedures for measuring Pension Information Specificity (PIS). The regression analysis was then replicated using SRS as the independent variable and credit rating and credit outlook as the dependent variables. The results in Table 4.10, Panel A, indicate a positive association between *SRS* and credit rating decisions for Moody's, which is statistically significant (Column 1). No significant results were found for S&P and Fitch (Columns 2 and 3). Columns 4 and 5 show that SRS is directionally consistent but not statistically significant with credit rating disagreement[13]. In general, the study reveals similarities in the impact of strategic information on credit rating decisions, but with variations in magnitude and direction across CRAs. The variations may stem from different interpretations and disclosures of strategies of information in the strategic report. Some CRAs may place more emphasis on qualitative information while others may focus on quantitative information. The results are consistent with Thakor (2015) argument that some firms choose to disclose information about their strategy while others do not. This can be attributed to the inherently subjective nature of strategy, which is prone to different interpretations by agents with heterogeneous beliefs, leading to differing opinions about the optimal course of action.

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[13] While CRAs offer several products, including credit ratings, credit watches, and rating outlooks in their rating reports, which contain valuable information, this study employs credit outlook as an alternative measure for credit risk. Table 4.10, Panel B, results reveal a significant negative association between *SRS* and credit outlook for S&P, consistent with the results of PIS (Columns 1, 2, and 3). The results for Moody's and Fitch are not statistically significant and inconsistent in direction. The results in columns 4 and 5 also present a statistically negative association between SRS and credit outlook disagreement.

Table 4.10 Strategic report specificity (SRS) on the credit rating

	H1						H2			
	(1)		(2)		(3)		(4)		(5)	
Variables	Moody		S&P		Fitch		Disagreement		Disagreement_Magnitude	
SRS	*0.189**	*(1.87)*	*0.104*	*(0.95)*	*0.041*	*(0.33)*	*0.221*	*(0.91)*	*-0.039*	*(-0.54)*
Similarity	-7.975	(-0.78)	-17.447	(-1.67)	-12.403	(-1.02)	41.208	(1.45)	11.351	(1.41)
Readability	0.017	(0.55)	-0.010	(-0.23)	-0.052	(-1.30)	0.051	(0.40)	0.010	(0.26)
Sentiment	-0.129	(-1.23)	-0.097	(-0.99)	-0.025	(-0.30)	-0.121	(-0.57)	-0.023	(-0.28)
Length	-0.014	(-0.06)	0.393	(1.50)	0.213	(0.81)	-1.242*	(-1.68)	-0.212	(-1.14)
Cash Holding	-0.653***	(-2.83)	-0.778***	(-4.09)	-0.759***	(-3.60)	0.333	(0.67)	-0.116	(-0.88)
Rent Expenses	-20.091	(-1.55)	22.703**	(2.11)	9.024	(1.38)	75.895***	(3.00)	40.111***	(6.26)
Total Debt/TA	-2.061	(-1.23)	1.212	(0.62)	-0.452	(-0.18)	4.887	(0.94)	0.557	(0.41)
Altman Z-Score	-0.258*	(-1.86)	-0.369***	(-2.78)	-0.228	(-1.55)	1.087***	(2.70)	0.155*	(1.97)
Int_Cov	-0.062***	(-3.33)	-0.039*	(-2.01)	-0.053***	(-2.77)	-0.174***	(-2.82)	-0.019	(-1.47)
SIZE	-1.241	(-1.60)	-0.520	(-0.70)	-1.189	(-1.43)	2.246*	(1.73)	0.962**	(2.01)
Intangible Assets	-5.901***	(-6.18)	-3.512***	(-2.93)	-0.169	(-0.12)	-4.726**	(-1.98)	-0.380	(-0.46)
Profit	0.001	(0.03)	-0.024	(-1.07)	0.001	(0.09)	0.069	(1.28)	-0.014	(-0.81)
Profit Volatility	-0.072	(-1.38)	-0.063	(-1.46)	-0.038**	(-2.50)	-0.231	(-1.38)	-0.003	(-0.10)
Funding%	-0.027***	(-2.73)	-0.029**	(-2.59)	-0.028	(-1.65)	-0.034	(-1.55)	-0.011	(-1.45)
Equity%	-0.007	(-0.46)	-0.029*	(-1.88)	-0.017	(-1.11)	-0.057**	(-1.97)	-0.002	(-0.19)
_cons	31.216***	(11.65)	29.709***	(10.08)	29.377***	(9.09)	-15.026**	(-2.06)	-0.137	(-0.08)
FE Year	Included		Included		Included		Included		Included	
FE Industry	Included		Included		Included		Included		Included	
N	117		141		117		123		129	
Adj. R^2	0.77		0.68		0.71				0.49	

The number in parentheses represents the t-test value.
***, **, and * denote the statistical significancy at 1%, 5%, and 10%, respectively.

Table 4.10 Panel B: Strategic report specificity (SRS) on the credit outlook

	H1						H2			
	(1)		(2)		(3)		(4)		(5)	
Variables	Moody		S&P		Fitch		Disagreement		Disagreement_Magnitude	
SRS	*-0.013*	*(-0.79)*	*-0.040****	*(-2.81)*	*0.008*	*(0.72)*	*0.055****	*(3.02)*	*0.064****	*(2.86)*
Similarity	-0.599	(-0.29)	-1.790	(-1.27)	-0.141	(-0.12)	0.536	(0.26)	-0.446	(-0.18)
Readability	0.002	(0.25)	-0.003	(-0.35)	-0.007	(-1.22)	-0.010	(-1.02)	-0.017	(-1.40)
Sentiment	-0.003	(-0.13)	0.027	(1.65)	0.023*	(1.68)	0.022	(0.97)	0.049*	(1.79)
Length	0.005	(0.11)	0.016	(0.46)	0.036	(1.31)	0.038	(0.80)	0.101*	(1.74)
Cash Holding	-0.101***	(-2.80)	0.054**	(2.07)	0.004	(0.18)	-0.104***	(-3.07)	-0.083**	(-2.00)
Rent Expenses	0.875	(0.57)	1.339	(0.70)	-6.330***	(-6.25)	1.093	(0.64)	0.987	(0.47)
Total Debt/TA	-0.196	(-0.57)	0.634**	(2.48)	-0.546**	(-2.31)	0.481	(1.32)	0.354	(0.79)
Altman Z-Score	-0.105***	(-5.95)	-0.082***	(-5.18)	-0.007	(-0.62)	0.032	(1.58)	0.026	(1.08)
Int_Cov	0.002	(0.80)	0.012***	(4.80)	0.001	(0.40)	0.001	(0.18)	0.001	(0.27)
Size	0.067	(0.51)	-0.338***	(-3.65)	0.086	(1.17)	0.124	(1.01)	0.158	(1.06)
Intangible Assets	0.430**	(2.19)	0.259	(1.63)	-0.309*	(-1.77)	-1.129***	(-5.38)	-1.389***	(-5.42)
Profit	0.004	(0.97)	-0.005	(-1.34)	0.003	(1.56)	-0.004	(-0.90)	0.001	(0.12)
Profit Volatility	-0.009	(-1.15)	0.020***	(3.75)	-0.003	(-1.38)	0.018**	(2.07)	0.018*	(1.67)
Funding%	0.005***	(3.26)	0.008***	(5.59)	-0.004***	(-3.10)	0.000	(0.05)	-0.004	(-1.38)
Equity%	-0.000	(-0.13)	0.011***	(4.96)	-0.005***	(-2.78)	0.005*	(1.70)	0.002	(0.59)
_cons	0.616	(1.55)	0.052	(0.16)	0.121	(0.40)	1.076**	(2.49)	0.806	(1.53)
FE Year	Included		Included		Included		Included		Included	
FE Industry	Included		Included		Included		Included		Included	
N	117		141		117		129		129	
Adj. R^2	0.77		0.68		0.71				0.49	

The number in parentheses represents the t-test value.
***, **, and * denote the statistical significancy at 1%, 5%, and 10%, respectively.

4.5.4 The Endogeneity concern

The study's findings may be subject to endogeneity bias due to omitted variables that could lead to spurious associations between pension information specificity and credit rating/rating disagreement. For instance, firms may intentionally disclose a particular level of information in their strategic report to target a specific credit rating grade (Alissa et al., 2013). In addition, a firm with a high credit rating may feel more comfortable disclosing more detailed pension information as this could enhance their creditworthiness and potentially result in a higher rating. Lastly, firms may choose to disclose more detailed pension information to reduce the level of credit rating disagreement, which can create uncertainty that arises from having higher information opacity problems and consequently higher information asymmetry between firms and investors (Livingston & Zhou, 2010). The quality of disclosure among firms is highly variable and depends on the cost of information. Sponsoring firms may choose to improve their disclosure quality if they plan to acquire a credit rating or access the public debt market, but a lack of quality disclosure could also indicate the presence of private information. This variation between the quality of pension information and creditworthiness creates an endogeneity problem that could bias the relationship between pension information specificity and the credit rating decision.

This may result in a reverse causality problem. To address this possible endogeneity problem, this study uses an instrumental variable (IV) approach, with two stages of least squares (2SLS), utilizing the level of collective agreements by trade unions as the instrumental variable for the actual level of pension information quality. The level of pension information is a primary source for trade unions in their benefit negotiations with employers (Arslan-Ayaydin et al., 2021; Chen et al., 2011). This approach can help mitigate endogeneity bias by identifying a variable that is correlated with the pension information specificity but not with other omitted variables that may influence credit rating disagreement.

In this study, the relevance and exclusion conditions are satisfied by using collective agreement among trade unions (***CA_TU***) as the instrumental variable. Firms with higher levels of collective agreement tend to be more forthcoming about their pension information, which suggests a positive relationship between the firm's collective agreement with trade unions and its pension information specificity. However, it is unlikely that the discussion of creditworthiness by credit rating analysts would be affected by the collective agreement with trade unions (the trade union power measured by collective agreement is an exogenous variable). The results from the two stages of regression will be presented along with the results from the one-stage regression.

The results of the instrumental variable (IV) estimation to address potential endogeneity are presented in Table 4.6, columns 3 and 4. The results of the first stage regression, presented in Column 3, demonstrate the strength and relevance of the chosen instrumental variable in the analysis. The negative and significant coefficient of the instrumental variable at the 1% level indicates a positive relationship between firm-level disclosure and the disclosure patterns of peer firms, thereby supporting the relevance assumption. Column 4 reports the results of the two-stage least squares (IV) model, which analyses the variable Disagreement as a dependent variable (Equation 2). The results indicate that the level of pension information specificity is negatively related to the collective agreement with trade unions. The corresponding coefficient for the instrumented Disagreement variable is -0.092 and is statistically significant at the 10% level. This result is consistent with the main OLS estimate. Additionally, the control variables are similar to the results under the main OLS. In conclusion, the findings from the IV estimation strongly support the second hypothesis and reinforce the established negative relationship between the level of pension information specificity and credit rating disagreement. These results emphasize the significance of pension information specificity and its overriding impact in mitigating credit rating disagreement.

4.6 Conclusion

Previous literature has often shown that the complexity and exposure to having a defined pension scheme increase firms' default risk financing (Basu & Naughton, 2020; Kraft, 2015; Almaghrabi et al., 2020), in particular firms with unfunded pension plans. The clarity and transparency of the disclosure about defined benefit pension plans are deemed crucial in assessing default risk while a lack of clarity about the plan provides more uncertainty due to information asymmetry. This may result in more subjectivity and judgment about pension plans during credit rating assessment. This study examines whether more specific disclosure about the defined benefit pension scheme of sponsoring firms affects credit rating analysts' assessment of the overall firm's default risk. Specifically, this chapter examines whether the pension information pension information specificity in the strategic report is associated with the credit rating decision, and subsequently, whether levels of information specificity affect credit rating analysts differently which gives rise to rating disagreement between CRAs.

The findings are threefold. First, this study provides evidence that a higher level of pension information specificity is associated with credit rating decisions. The study highlights the importance of the pension scheme as a crucial element in the rating process for the three major CRAs. Furthermore, the study finds that the level of pension information specificity is negatively associated with the level of disagreement in credit ratings among CRAs. These findings suggest that credit rating analysts react positively to greater transparency and detailed and specific disclosure, which reduces credit rating uncertainty about soft information and soft adjustments in the credit rating assessment. Additional analysis indicates that the level of rating disagreements, funding ratio, and the presence of institutional investors strengthen the effect of pension information quality and rating disagreement. On the other hand, alternative measures of default risk and using the entire strategic report instead of pension information

show no effect. Thus, the credit rating and rating disagreement are confined to pension information specificity.

From a policymaking perspective, the findings suggest that firms that comply with regulatory requirements for more specific disclosure, particularly in the strategic report, may experience positive impacts. The results demonstrate that higher levels of pension information specificity benefit not only employees and their representatives, such as trade unions but also public market participants, such as credit rating analysts. This is significant because credit rating analysts play a crucial role in assessing a firm's default risk, and access to more specific information reduces the cost of obtaining critical data. However, the variation in the importance of the content of the strategic report underscores the need for guidance on reporting information in the strategic report to ensure consistency in reporting behaviour.

This study is subject to several limitations. First, it is important to note that the pension information specificity in the strategic report may differ from other elements of the strategic report. Future research may examine different topics that influence credit rating analysts and whether firms disclose them differently. This could help us understand whether firms follow a topical disclosing strategy after measuring the cost and benefit of disclosing each topic and whether the cost and benefit of disclosing different topics influence their creditworthiness. Second, as pension plans are a form of employee benefit, it is reasonable to assume that firms that prioritise their employees would also value workforce engagement disclosure specificity, which may serve as a measure of employee importance. Future research may investigate the link between workforce engagement disclosure specificity and credit analysts' decisions using a larger sample, as larger firms are required to disclose their workforce engagement under the Companies Act 2006, Section 172. Lastly, CRAs tend to assign preferential ratings to politically similar firms by delaying negative signals as favourable rating activities, and firms increase the proportion of donations to their favoured party following favourable credit ratings.

This raises concerns about rating bias resulting from political pressure (Bhandari & Golden, 2021; Nguyen et al., 2023) or regional bias (Sonenshine & Kumari, 2022; Yalta & Yalta, 2018). Future research may conduct a single or cross-country study to examine the extent of political/regional pressure on credit rating decisions.

Chapter 5: Conclusion and Recommendations

5.1 Overall Summary

This thesis consists of three inter-related empirical chapters with the main purpose of investigating the determinants and the consequences of pension accounting practices. Due to the recent debates and emerging research on the importance of pension regulations and information in sponsoring firms for defined benefit pension plans, this thesis aims to investigate whether sponsoring firms utilise the flexibility in pension accounting regulations to engage in earnings management practice and whether the amendments to pension accounting standards influence a firm's allocation of pension plan assets, and if so, what are the key determinants influencing the extent of allocation of pension plan assets (i.e., pension risk in pension plan assets). This thesis also examines whether sponsoring firms alter disclosure practice when faced with strong unionisation and whether firms' cash holding influence this relationship. Lastly, this thesis examines whether the disclosure transparency of sponsoring firms influences their credit rating decision, and if so, whether the quality and quantity of pension disclosure can be operationalised and influence credit rating differently by the CRAs when firms seek multiple credit ratings.

To achieve these aims, this study adopts a positivist viewpoint. In terms of selecting a research paradigm, the three papers were designed and adopted a deductive research approach. Data were collected from multiple sources to test different hypotheses related to pension accounting regulations and disclosure practices, and to examine the relevance of particular theories. Moreover, this thesis applies a quantitative research method and relies on secondary data to examine multiple relationships between dependent variables (*Equity%, PIS, and Disagreement*) and their related factors (financial distress, cash holdings, SRS, and sustainability factors), while taking into consideration several control variables (firms'

performance and pension plan performance factors). The data for this thesis has been collected from multiple sources, including sponsoring firms' annual reports and websites, Thomson Reuters Eikon, and Bloomberg. A wide range of statistical models, techniques, and software was used to analyse the data, including Stata, R, and Python.

5.2 Summary of Research Findings

In the first paper (Chapter 2), the study finds evidence, from a range of UK and EU settings, that changes in IAS 19R, particularly the elimination of the ERR assumption, are positively associated with a reduction in the allocation of pension plan assets from high-risk assets. In addition, the findings also show that the allocation of pension plan assets towards less risky assets exists in financially distressed firms. Although the baseline analysis shows that firms shift out of equities post-IAS 19R due to the elimination of earning management mechanisms, there is variation in the allocation of pension plan assets from equities to *other assets* class, and variation also exists at the country level. One possible reason for the variation in asset allocation is the social and welfare system of each country, which may influence their pension system requirements in the public and private sectors.

In the second and third papers (Chapter 3 and Chapter 4, respectively), the studies are based on collected data from strategic reports for firms listed in the FTSE 350 index. In the second paper, the analysis provides an answer to whether strong unionisation can influence a firm's financial disclosure quality and quantity of pension information, and whether the level of cash holdings, if any, influences the relationship between unionisation and the quality of pension disclosure. The findings show a positive association between the pension information specificity and the presence of strong unionisation in sponsoring firms. This relationship is stronger in firms with higher cash holdings.

In relation to the third paper, this thesis finds a significant negative association between the quality of pension information disclosure, particularly the specificity of the pension information disclosure, and credit rating decisions. While pension information specificity is important for creditworthiness, it is also an important element in resolving credit rating disagreements between CRAs, particularly when the pension information specificity is low. Table 5.1. provides a summary of the hypotheses/research questions, key findings, and incremental contributions vis-à-vis prior literature.

5.3 Research Implications

This thesis has several implications for both academics and practitioners. Firstly, regarding firms sponsoring defined benefit pension plans, agency theory and positive accounting theory provided a useful framework for understanding the motivation behind earnings management in these firms and for analysing the resulting outcomes. Furthermore, the European economic context provides an advantage to this research by providing evidence for the impact of changes in pension accounting regulations in a wider context. Currently, the literature shows single county evidence, suggesting that the social and welfare system may influence the impact of changes in pension accounting and firms' de-risk pension plan risk post-IAS 19, indicating the inherent pitfalls of generalising the pension regulation amendment. The findings of this thesis will be of interest to several stakeholders, including sponsoring firms, regulators, trade unions, and investors.

Second, regarding accounting regulators' practices, the amendment to the pension accounting regulation eliminates earnings management practices from pension reporting, reducing pension risk by allocating pension plan assets from high-risk assets such as equities. However, it is unclear whether sponsoring firms actually implement a re-allocation from high-risk assets to low-risk assets in order to reduce the risk level of their pension plans. They may

maintain a similar pension risk level by shifting out of equities, which are high-risk assets, into *other assets* class that also have high risk, especially since there is a noticeable trend towards *other assets* class that include assets with different risk levels. These findings highlight the need for more detailed information about *other assets* class and overall pension risk. The findings will be of interest to several stakeholders, including accounting standards setters, pension regulators, trade unions, and equity-market participants. While changes in pension accounting regulations have economic consequences on firms' investment strategies for their pension plan assets to de-risk pension risk, it would be more meaningful to provide further details or mapping regarding *other assets* class.

Third, in respect of unionisation practice, insights from stakeholders' salience theory and collective agreement theory contribute to an understanding of the drivers behind firms' adoption of different disclosure strategies in the presence of strong unionisation, which can give them an information advantage and strengthen their bargaining power. This thesis reveals that studies on the trade union influence show that firms adopt several strategies to gain information advantage to curb unionisation rent-seeking behaviour. The findings provide crucial insight to policymakers aiming to improve the specificity and transparency of firms' disclosure. Specifically, the results suggest that the strong presence of unionisation plays a positive role in enhancing corporate reporting practice and improving reporting quality, especially when employees and trade unions are considered salient stakeholders. However, the results need to be considered with caution, particularly with respect to employees, trade unions, and regulations that use firms' information environment to offer high-quality disclosure for employee benefits such as pension schemes. The findings demonstrate the impact of unionisation on corporations, potentially exacerbating information asymmetry. Employees and their representatives need to be aware that managers may respond to their demands for better employment benefits and rent-seeking behaviour by exercising discretion in their narrative

disclosure of fundamental elements of benefits, such as employees' pensions. In contrast, investors who are looking for useful and transparent information for their portfolio selection by understanding that firms with stronger unionisation and higher cash holdings may follow different disclosure strategies.

Fourth, with regard to practitioners, the decline in the quality of strategic reports, particularly the pension information section, in the UK, despite repeated calls for firms to provide more specific disclosure and avoid using vague language and boilerplate disclosures, is discussed. The FRC emphasized the importance of reporting the risks and changes in the business environment that firms face and how risks and uncertainties are reflected in their strategy and business model. In the current business environment of increased uncertainty, with challenges such as the Russian-Ukraine war, the Covid-19 pandemic, and the cost-of-living crisis, businesses need to be agile and continually assess evolving risks and reflect them in their strategy and reporting. Therefore, companies should clearly explain their investment strategy and associated risks, including any asset-liability matching arrangement, such as liability-driven investment. Investors also want to understand how firms identify the stakeholders that the company depends on. Although it is generally expected that the workforce is among the key stakeholders that firms report on, investors anticipate that the most important stakeholders will vary among companies. Investors also expect firms to consider the connectivity between stakeholders, such as employees and future pension holders. Thus, the textual content highlights the relevance of pension information in the strategic report to credit rating analysis and the importance of behavioural decision theory in explaining disagreements between CRAs. Lower disclosure quality increases the uncertainty and the chances of different biases by credit rating analysts, resulting in rating disagreements.

Table 5.1 Summary of research hypotheses and Results				
No	Hypotheses	Results	Prior Studies	Incremental contributions
Chapter 2 (Paper 1)				
1	The firm using a higher ERR assumption pre-IAS 19R will re-balance the DB pension plan investment from high-risky assets post-IAS 19R	Support	Found a positive relationship: (Anantharaman & Chuk, 2018) Found no relationship: (Barthelme et al., 2019)	This chapter clarifies that, in general, firms using higher ERR assumptions pre-IAS 19R re-allocate pension plan assets from high-risk assets. This allocation differs between countries and cannot be generalised for all countries. In addition, firms do not necessarily reduce pension plan risk by reducing equity investments. However, firms may shift out equities toward other high-risk assets.
2	There is a significant impact of a firm's financial distress on the association between IAS 19R adoption and risk-taking behaviour in pension investment.	Support	Found evidence that firms in financial distress reduce allocation to riskier asset classes, such as equities (Amir & Benartzi, 1999; Petersen, 1996; Rauh, 2009).	This chapter clarifies that firms in financial distress allocate pension plan assets from high-risk assets suggesting that firms in financial distress adopt risk management strategies.
Chapter 3 (Paper 2)				
4	There is a significant association between unionisation and pension information specificity.	Support	Found a positive relationship: (Chantziaras, Dedoulis, Grougiou, et al., 2020; Chen et al., 2016; Edmans, 2011; Faleye & Trahan, 2011; Hasan et al., 2018; Wei et al., 2020) Found Negative relationship: (Arslan-Ayaydin et al., 2021; Hui & Chan, 2021; Jansen, 2014; Korpi & Shalev, 1979; Molina & Barranco, 2016; Tan et al., 2022)	This chapter contributes to the literature on the influence of stronger unionisation on firms' disclosure strategies. The relationship can be positive or negative, depending on the clarity and transparency of the disclosure together with its significance to stakeholders, as well as the salience of the stakeholders who influence firms to provide high-quality disclosure.
5	Firms' cash holding has a significant impact on the association between unionisation and pension information specificity	Support	Found a positive relationship: (Kleiner & Bouillon, 1988; Robbins, 1994) Found a negative relationship (Ahmad & Kowalewski, 2021; Klasa et al., 2009; Matsa, 2010)	This chapter provides evidence regarding the significance of maintaining a higher level of cash and its impact on the relationship between trade unions and disclosure transparency. This relationship can be viewed as either positive or negative, depending on firms' perception of trade unions as salient stakeholders. Companies may enhance their disclosure transparency by considering employees and trade

				unions as vital partners, especially when they possess a substantial cash reserve.
Chapter 4 (Paper 3)				
7	There is a negative association between the level of pension information quality and credit rating accuracy.	Support	Found evidence for the impact of pension information on the credit rating decision (Chen et al., 2022; Hallman & Khurana, 2015; Choi et al., 2020; Donovan et al., 2021; Mayew et al., 2015; Gallagher & McKillop, 2010; Bozanic et al., 2022).	The findings of this chapter provide evidence for the credit-value relevance of pension information in the strategic report for credit rating decisions. This suggests that the inclusion of pension information in the strategic report is an important factor that CRAs should consider when making credit rating decisions.
8	There is a negative significant association between the level of pension information quality and the credit rating disagreement between CRAs	Support	Found evidence for the negative association between high-quality pension information and rating disagreement.	This chapter provides evidence of the importance of specific pension information for enhancing the transparency of pension disclosure and reducing uncertainty surrounding pension risk (TPR, 2023) for CRAs. Such improvements can ultimately result in reduced subjectivity and bias, leading to less disagreement in credit ratings.

5.4 Limitations and Directions for Further Research

Although this thesis sought to examine the pension accounting amendment across European economies and the disclosure practices in UK-listed firms, there are two main limitations in terms of generalisability and the measurements.

Firstly, the sample only covers publicly listed companies on the London Stock Exchange, and the results may not be generalisable to other contexts. This is a common practice for studies that examine a single context (Dyer et al., 2017), due to different unionisation-employer legislations across countries. While there is an institutional force on the asscoation between the trade unions and corporation, Future reseaaarch may examine the impact of unionisation on disclosure strategies in a cross country to show the institutional differences impact as Firms may disclose specific information about their pension plans due to factors such as legal and political factors, including the influence of labour parties on disclosure strategies.

Secondly, the study measures the power of unionisation through the union density at the industry level, which may not fully capture the strength and influence of higher unionisation. (Bronars & Deere, 1990; Hilary, 2006; Mitra & Hakjoon Song, 2017). However, this measure may not be the most suitable proxy to capture the level of unionisation power at the firm level and using a proxy at the firm level should be considered to measure unionisation power. Future investigations using firm-level measures of the unionisation rate would be ideal to overcome this limitation.

Finally, while text specificity measures the frequency and precision of pension information in the strategic report, it primarily focuses on the quantitative density of details. Quantitative information is known for its precision and verifiability (Beretta & Bozzolan, 2004; Shrives & Brennan, 2015; Sydserff & Weetman, 1999). This thesis overcomes previous studies' limitations, which historically found that large firms are known for providing more symbolic

or passive disclosure and lower substantive disclosure about their compliance with legal requirements (Day & Woodward, 2004; Shrives & Brennan, 2015; Sydserff & Weetman, 1999; Warsame et al., 2002). Therefore, several authors emphasise the importance of narrative specificity and incorporate it in their assessment (Akkermans et al., 2007; Beretta & Bozzolan, 2004; de Beaugrande & Dressler, 1981; Dyer et al., 2017; Hope et al., 2016; Sydserff & Weetman, 1999). This study overcome such problem by reducing any manual assessment by automate the assessment process of text specificity to eliminate bias. However, a limitation arises in capturing the nuanced direction of the narrative. The specificity score may not fully convey whether the information signifies positive or negative news. This limitation emphasises the need for a balanced consideration of other narrative aspects when assessing the effectiveness of the information in different contexts.

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Appendix

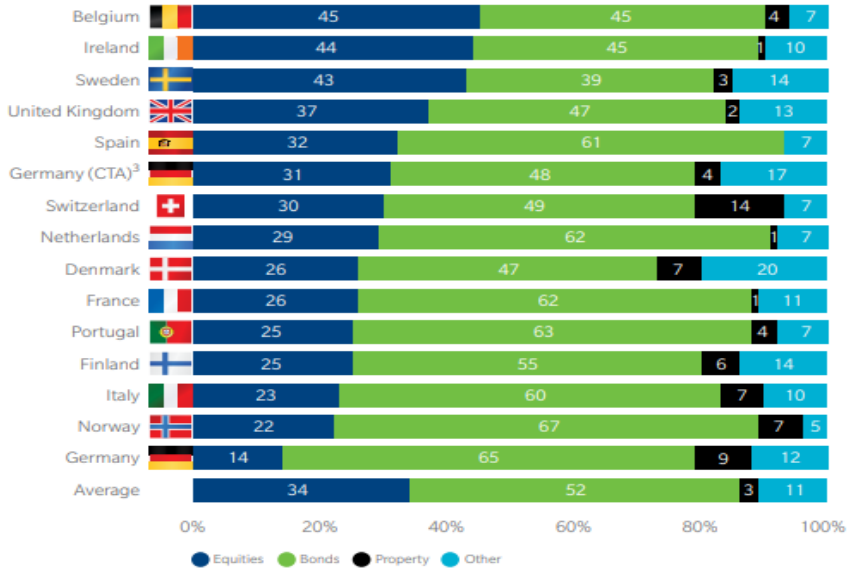
Appendix 2.1 Breusch and Pagan Lagrangian multiplier test for random effects

Estimated results:	Var	Sd=sqrt(Var)
Equity%	362.156	19.030
e	69.251	8.322
u	200.625	14.164
Test: Var(u) = 0		
chibar2(01) = 4027.75		
Prob > chibar2 = 0.0000		

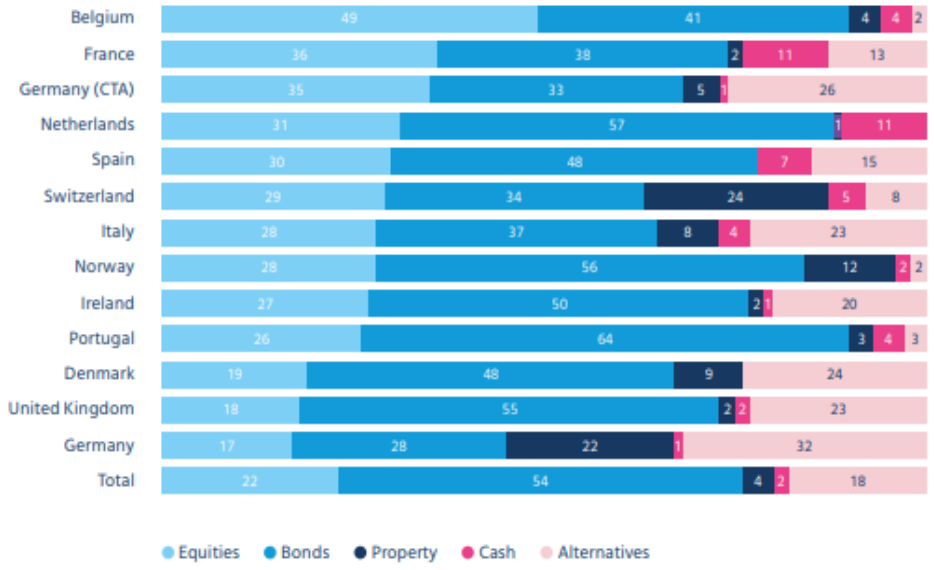
Appendix 2.2 Hausman test and t-test for fixed effect and random effect model

	FE Model (b)	RE Model (B)	Difference (b-B)	S.E. sqrt(diag(V_b-V_B))
PostxEC	-0.336	-0.432	0.096	.
EU	-22.493	-8.191	-14.302	5.784
Post	-7.210	-3.527	-3.683	0.493
Horizon	-1.594	-1.630	0.036	0.052
Exposure	0.004	0.007	-0.003	.
Funding	-0.001	-0.001	0.000	.
Corridor	-3.276	-11.082	7.806	1.245
ERR_DR	0.352	0.064	0.288	.
Size	-1.115	-1.742	0.627	0.162
STDCF	-0.098	-0.217	0.120	.
Leverage	0.004	0.003	0.001	.
Dividend	-0.035	-0.036	0.001	.
FF	-0.545	5.019	-5.564	0.590
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
chi2(12) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 268.50				
Prob>chi2 = 0.000				

Appendix 2.3 Broad strategic allocation by country

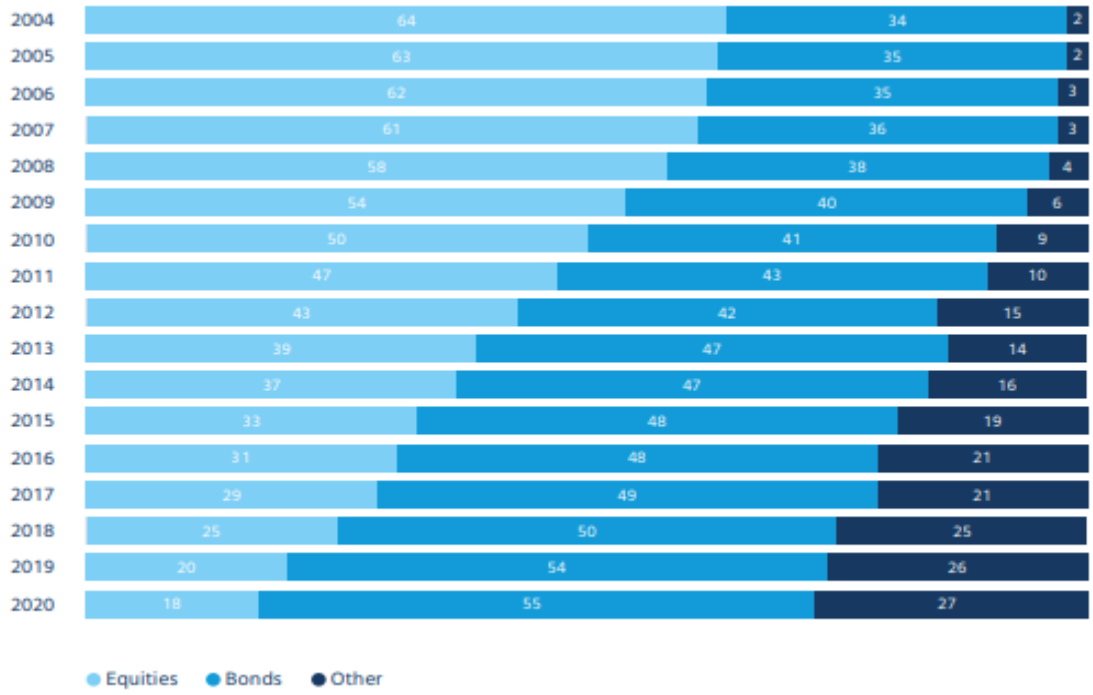


Source: European Institutional Marketplace Overview 2014: Asset Allocation Survey (2014)



Source: European Asset Allocation Insights 2020: Investing in the future (2020)

Appendix 2.4 Changes in broad strategic asset allocation in UK plans(%)



Source: European Asset Allocation Insights 2020: Investing in the future (2020)

Appendix 2.5 Comparison of Social and welfare models in Europe

Model	Nordic	Continental	Mediterranean	Anglo-Saxon
Countries	Denmark, Finland, Norway, Sweden, and the Netherlands	Germany, Austria, and France	Italy, Greece, and Spain	United Kingdom and Ireland
Coverage	Universal	Earnings-related	Means-tested	Means-tested
Eligibility Criteria	Everyone is eligible for the pension system, regardless of their income or employment status.	Only those who meet certain income or employment criteria are eligible for the pension system	Only those who meet certain income or employment criteria are eligible for the pension system	Only those who meet certain income or employment criteria are eligible for the pension system
Benefits	Generous	Moderate	Low	Low
Political System	Social Democracy	Corporatism	Familialism	Liberalism
Social System	Universalism	Bismarckian	Familialism	Residualism
A mix of Private and public DB plans	Public and private	Public and private	Public and private	Public and private

Appendix 3.1 Unionisations and pension information specificity (PIS)- Moderating 2018 Effect

	PIS	
Unionisation X 2018	0.578	(0.91)
Unionisation	2.365***	(5.20)
2018	-1.044	(-0.72)
SRS	0.520*	(1.76)
Cash Holding	-0.581	(-1.13)
Altman Z-Score	0.157	(0.74)
Leverage	0.019*	(1.68)
MTB	-0.108	(-1.40)
PB	-0.010	(-1.34)
Size	-2.264***	(-3.76)
ROA	0.104	(0.93)
Loss	-2.065	(-1.18)
Funding	0.090***	(2.67)
_cons	11.234	(1.64)
N	357	
Adj. R^2	0.18	

This table presents the results of an OLS analysis of the relationship between the pension information specificity and unionisation measured by trade union density, controlling for various firm characteristics and performance indicators. Standard errors are adjusted for heteroskedasticity and serial correlation, as well as clustered at the firm level.
The variable ***Unionisation X 2018*** is to capture the effect of Section 172 on the strategic report specificity, particularly the influence on workforce engagement.
The number in parentheses is the t-test value.
***, **, and * denote the statistical significancy at 1%, 5%, and 10%, respectively.
All variables are defined in Table 2.2

Appendix 3.2 List of reviewed papers on information attributes and their implications.

Author	Study	Country	Sample	Readabili	Length	Boilerpla	Stickines	Specificit	Others	Disclosure/ Report	Consequences Market	Findings	Analysis Method	Journal
Miller, 2002	Earnings Performanc e and Discretiona ry Disclosure				X					experiencing an extended period of seasonally adjusted earnings increases.	Earnings Performance	The find increase in disclosure around earnings announcements		JAR
Beattie and Thomson (2007)	Lifting the lid on the use of content analysis to investigate intellectual capital disclosures	UK							X	Intellectual capital (IC) disclosures		It is concluded that the depth. and breadth of the IC concept and the lack of common definitive language make it difficult to establish the extent and nature of disclosure currently provided		AF
Li (2008)	Annual report readability, current earnings, and earnings persistence	US A	50,000	X	X				self-referential words, exclusive words, causation words, positive emotion words, and future tense verbs.		Earnings persistency	(1) the annual reports of firms with lower earnings are harder to read (i.e., they have a higher Fog index and are longer); and (2) firms with annual reports that are easier to read have more. persistent positive earnings.	Fog index- from the computational linguistics literature, Word number to measure the Length – as a measure of readability	JAE

Appendix 3.2 List of reviewed papers on information attributes and their implications.

Author	Study	Country	Sample	Readabili	Length	Boilerpla	Stickines	Specificit	Others	Disclosure/ Report	Consequences Market	Findings	Analysis Method	Journal
You and Zhang (2009)	Financial reporting complexity and investor underreacti on to 10-K Informatio n	US A	123,44 9		X					10-K filing	Market reaction	The market under-reaction to 10-K filings is stronger for firms with longer and more complex 10-K filings.	Word number as a proxy for the complexity	RAS
Miller, 2010	The Effects of Reporting Complexity on Small and Large Investor Trading	US A	13,000 1995-2006	X	X					10-K filing	Trading volume	More complex (longer and less readable) filings are associated with lower overall trading for small investors	Fog index Word number to measure the complexity and length	TAR
Brown and Tucker (2010)	Large-Sample Evidence on Firms' Year-over-Year MD&A Modificatio ns	US A	28,142 1997-2006						A trend from year to year	MD&A	Economic changes, the magnitude of stock price, and price reaction	First, firms with larger economic changes modify the MD&A more than those with smaller economic changes. Second. the magnitude of stock price responses to 10-K filings is positively associated with the MD&A modification score. Third, MD&A modification scores have declined even as MD&A disclosures have become longer	Vector Space Model (VSM) to compare the current year MD&A to the previous year.	JAR

Appendix 3.2 List of reviewed papers on information attributes and their implications.

Author	Study	Country	Sample	Readabili	Length	Boilerpla	Stickines	Specificit	Others	Disclosure/ Report	Consequences Market	Findings	Analysis Method	Journal
Feldman et al. (2010)	Manageme nt's tone change, post earnings announcem ent drift and accruals	US A	153,98 8 1994-2006						Positive and Negative categories to measure the tone. change	Managemen t Discussion and Analysis (MD&A) section of Forms 10-Q and 10-K	Market Reactions	The results indicate that short window market reactions are associated with tone change. management's tone change adds significantly to portfolio drift returns.	main variables as tone signals: the number of positive (negative) words, (Pos, Neg, and Pos–Neg), all divided by the number of total words.	TAR
Lehavy et al. (2011)	The Effect of Annual Report Readability on Analyst Following and the Properties of Their Earnings Forecasts	US A	33,704 1995-2006	X						10-K filing	Analyst behaviour, including analyst following, analyst forecast revision response time, the information content of analysts' reports, and the properties of analyst earnings forecasts	Analysts following, the amount of effort incurred to generate their reports, and the informativeness of their reports is greater for firms with less readable 10-Ks. Less readable 10-Ks are. associated with greater dispersion, lower accuracy, and greater overall uncertainty in analyst earnings forecasts	Fog Index	TAR
Callen et al. (2013)	Accounting Quality, Stock Price Delay, and	US A	29,345 1981-2006	X	X					10-K filing	Stock Price Delay, and Future Stock Returns	find that firms with poor readability are associated with significantly higher price delay	Fog Index Word Number for the length	

Appendix 3.2 List of reviewed papers on information attributes and their implications.

Author	Study	Country	Sample	Readabili	Length	Boilerpla	Stickines	Specificit	Others	Disclosure/ Report	Consequences Market	Findings	Analysis Method	Journal
	Future Stock Returns*													
De Franco et al (2013)	Analyst Report Readability	US A	639,829 2002-2009	X	X					Analysts' reports	Trading Volume and Analyst Forecast.	trading volume reactions are increasing in the readability of analysts' reports, consistent with the idea that readability affects investors' decisions	Fog Index Word Number for the length	CAR
Lawrence (2013)	Individual investors and financial disclosure	US A	158,034 1994-1996	X						10-K filing	Frequency trading and financially literate individuals.	individuals invest more in firms with clear and concise financial disclosures. Individuals' returns are increasing with clearer and more concise disclosures, implying such disclosures reduce individuals' relative information disadvantage.		JAE
Huang et al. (2014)	Evidence on the Informatio n Content of Text in Analyst Reports	US A	363,952						X	Analyst report;	Analyst report; characteristics	Investors react more strongly. to negative than to positive text, suggesting that analysts are especially important in propagating bad news. Analyst report text is more. useful when the emphasis is on non-financial topics. Analyst report text has predictive value for future earnings growth	NAI¨VE BAYES MACHINE LEARNING	TAR

Appendix 3.3 Studies on the Implication of corporate disclosure

	Independent Variable					
Dependant variable	Readability	Length	Boilerplate	Stickiness	Specificity	Others
Earnings Performance	Merkley (2014)					
Market reaction and Trade volume	Li (2008) Miller, 2010 Callen et al. (2013) De Franco et al (2013) Lawrence (2013) Loughran and McDonald (2014) Franco et al. (2015) Hope et al. (2016)	You and Zhang (2009) Li (2008) Miller (2010) Loughran and McDonald (2014) Franco et al. (2015)			Hope et al. (2016)	Brown and Tucker (2010)
Analysts	Lehavy et al. (2011) De Franco et al (2013) Huang et al. (2014) Loughran and McDonald (2014) Franco et al. (2015) Hope et al. (2016) Lang and Lawrence (2015) Bozanic and Thevenot (2015)	Loughran and McDonald (2014) Franco et al. (2015) Lang and Lawrence (2015)	Lang and Lawrence (2015)	Bozanic and Thevenot (2015)	Hope et al. (2016)	Brown and Tucker (2010) Bozanic and Thevenot (2015)
Disclosure quality	Dyer et al. (2017)	Dyer et al. (2017) Cazier et al. (2021)	Dyer et al. (2017) Cazier et al. (2021)	Dyer et al. (2017)	Dyer et al. (2017) Cazier et al. (2021)	
Credit Rating and cost of debt	Bonsall and Miller (2017)					
Cost of Equity	Athanasakou et al (2020)					
Litigation	Nelson and Pritchard (2007)		Nelson and Pritchard (2007)			
Others	Lang and Lawrence (2015)	Lang and Lawrence (2015)	Lang and Lawrence (2015)			

Appendix 3.4 Summary of unionisation around the world.

	Europe-Nordic/North	Europe-South	British	US
Examples	Denmark, Belgium, Sweden, Norway and Germany	France, Spain, and Portugal	UK, but also partly Ireland	
Trend in the last twenty years. Presence of labour union	Strong. Denmark and Sweden where around 80 % of the labour force is a trade union member.	In France, only about 10 % of the labour force is organised.	there have been tendencies in the UK toward the derecognition of trade unions. 50% in 1980 30% in 2000 (18% private sector, 60% public sector)	40% in mid-1940 13% in 2000 10.7% in 2017
Characteristics		The Labour Market organisations are very weak.	labour market organisations regulate the industrial relations area.	Market-based trade-unionism
Employee-Management relationship	Strong institutions that regulate relations between the labour market organisations	the state plays a highly active role in regulating labour market conditions and industrial relations. The state is highly active in defining rules and conditions on the labour market (Ebbinghaus (2002)). The presence of labour union employees generally holds certain rights in relation to management.	The industrial relations system is based on voluntarism. Trade unions and employers voluntarily agreed on subjects. concerning collective bargaining. Weak institutional and legal foundation. the state was non-interventionist. Multi-employer bargaining has declined very dramatically. single employer collective bargaining or by more individualised relations between management and labour.	Growing opposition toward trade unions and organised labour. Not class-based, Very weak in relation to the post-industrial workforce
Structure/form	The increasing support for trade unions can partly be explained in relation to growing unemployment in Europe. In these countries, one can find a close connection between trade unions and the unemployment benefit system. Also, Women are equal members of trade unions compared to men. And high-density rates are seen in sectors that in other countries are only partly organised.	In France, extension mechanisms make collective agreements that cover the whole labour market, although the trade unions and the employers' organisations only cover a small part of the labour market.	complex organisational structure. The industrially oriented unions failed to incorporate white-collar employees and some manual crafts, both of which organized their unions. At the end of the nineteenth century, craft unions were already entrenched when general unions were formed in response to the formers 'closed' unionism that left un- and semi-skilled manual workers largely unorganised." (Ebbinghaus & Waddington (2000), p.715). During the last ten years, mergers have characterised the British trade union development (especially in TUC).	Structural changes in labour forces explain most of the decline in the trade union density.

Activity related to market, class, and society	Nation Level	class	Localized and sector-wise	

*Trade unionism:(Jensen, 2006)

Appendix 3.5 Registered donations to political parties by donors during the 2019 General election campaign

Registered donations to political parties by donor during the 2019 General Election campaign

	Value of donations by donor status				Total		
Party	Individual	Company	Trade union	Other[a]	Value	Number	% share
Conservative	£13,265,157	£5,997,751		£108,000	**£19,370,908**	**275**	63.1%
Labour	£159,442	£201,600	£5,039,754	£10,500	**£5,411,296**	**48**	17.6%
The Brexit Party	£4,150,000				**£4,150,000**	**9**	13.5%
Liberal Democrats	£1,004,998	£241,000			**£1,245,998**	**38**	4.1%
Green	£232,477	£10,000			**£242,477**	**9**	0.8%
Alliance	£25,000	£50,000			**£75,000**	**3**	0.2%
Plaid Cymru	£70,000				**£70,000**	**2**	0.2%
Advance Together	£32,500	£30,000			**£62,500**	**5**	0.2%
Scottish National Party	£14,929	£10,000			**£24,929**	**2**	0.1%
Women's Equality Party	£20,000				**£20,000**	**1**	0.1%
Democratic Unionist Party				£19,425	**£19,425**	**1**	0.1%
Renew		£15,000			**£15,000**	**1**	0.0%
Sinn Féin				£14,465	**£14,465**	**1**	0.0%
Total	**£18,974,503**	**£6,555,351**	**£5,039,754**	**£152,390**	**£30,721,998**	**395**	100%
% of total	62%	21%	16%	0%	100%		

Note: a. Other includes Limited Liability Partnerships, Public Fund, Unincorporated Association

Trade unionism around the world:

a) Trade Union in Europe

Trade unions have been strong in Europe for many years and they have influenced European society in many different ways. However, the trade unions differ greatly across countries, with strong density in northern parts of Europe, such as Denmark, Sweden, and Finland, while trade union density is much lower in the southern parts of Europe, including France, Spain, and Portugal. In general, there are at least four types of Industrial Relations (IR) systems in Europe (C. S. Jensen et al., 1995). First, the British system of industrial relations is characterized by weak institutional and legal foundations. Traditionally, labour market organisations regulate the industrial relations area. In the last twenty years, there has been a major development in the way industrial relations are organized in the UK. The regulation of the relationship between management and labour through multi-employer bargaining has declined dramatically and has been substituted either by single-employer collective bargaining or by more individualized relations between management and labour. The trend in the UK is towards the derecognition of trade unions (Korczynski & Ritson, 2000).

Second, the Nordic/Northern European model of industrial relations includes countries like Denmark, Sweden, Norway, and Germany. Strong labour market organisations and very strong institutions that regulate relations between labour market organisations characterize the Industrial Relations Systems in these countries. The relationship between employers and employees has a great impact on the labor market. The trade unions' density is high, with around 80 % of the labour force being a trade union member. Third, the Southern European model of the industrial relations system in Europe includes countries like France, Spain, and Portugal. The labour market organisations are very weak, especially towards membership. In France, only 10 % of the labour force is organized. However, the state plays a very active role

in regulating labour market conditions. This means that although the trade unions are very weak on a membership basis, the workplace is regulated by the state. Fourth, the former Eastern European countries are also trying to gain a say in this area. Although there are differences between former Eastern European countries. There is a fall in union support in some countries such as France, Germany, and the United Kingdom. However, it can be identified that trade union density has been stable or growing in some periods. This increasing support for trade unions can be partially explained by growing unemployment and the unemployment benefit system.

b) Trade Unionism in the United States (U.S.)

In the United States, labour-management relations have traditionally been hostile, especially when talking about organised labour. U.S. employers have not established practices such as nationwide negotiations or arrangements with trade unions, as is common in Europe. This means that the organisational structure and collective bargaining structure in the U.S. have traditionally been associated with important industrial sectors, such as the automobile industry. Trade unions reached their peak in the mid-1940s when more than 40% of the labour force were members of trade unions. Historically, trade unionism in the US was oriented toward a specific group in the labour market, namely male, white, full-time workers in industrial sectors, who formed the core of the trade unions. The union movement's strategies focused on fulfilling the needs of these groups and not other groups in the labour market. However, trade unions have experienced a major setback during the last twenty years, resulting in only 13% of the labour force in the US being organised. American society grew increasingly unequal while the trade unions were increasingly isolated and politically irrelevant. In the United States, there has been a tendency toward polarization of trends regarding collective bargaining. Although the changes are worldwide, the level of employer hostility to labour is unique in the US in many areas, such as decertification, concession bargaining, and strikes. In 1970, the emergence

of systematic attempts by employers to maintain a union-free workplace was witnessed. Through delayed information campaigns and outright intimidation, employers sought to achieve this goal. Furthermore, the downsizing of traditional industrial sectors is another important factor in explaining the membership decline in conjunction with new employment sectors that have no tradition for unionisation (Troy, 2000).