Doctoral theses at NTNU, 2023:169

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Doctoral thesis

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Norwegian University of Science and Technology
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ISBN 978-82-326-7042-0 (printed ver.)
ISBN 978-82-326-7041-3 (electronic ver.)
ISSN 1503-8181 (printed ver.)
ISSN 2703-8084 (online ver.)

Doctoral theses at NTNU, 2023:169

Printed by NTNU Grafisk senter

ACKNOWLEDGEMENTS

Doctoral research does not occur in social isolation. It is a joint product of the collective effort in which a variety of people and institutions knowingly and unknowingly contribute to the production of a thesis and the development of the PhD candidate as a researcher.

Many thanks and appreciation therefore are owed to all those good folks who so kindly lent me their ears and expertise. First and foremost, I am grateful to my supervisor Per Bjarte Solibakke for exceptionally good guidance. His encouragement as well as academic and moral support led me to complete this thesis. I also thank my co-supervisor Florentina Paraschiv and my co-authors Ranik Raaen Wahlstrøm, Ghulam Mustafa, and Per Bjarte Solibakke for their valuable feedback, productive collaborations, and conversations that led me to formulate new ideas. My sincere gratitude additionally belongs to the Faculty of Economics and Management and the Department of International Business for opening an opportunity for me to pursue a doctoral degree within my field of interest. Furthermore, I appreciate all the support I received from my colleagues in the department. I thank the head of the department, Hans Solli-Sæther, and my supervisor for taking the risk to allow me to teach entire courses at the institution.

My profound gratitude also extends to my family for their encouragement and keeping me on track whenever I wandered off. Finally, I thank myself for attempting to continuously improve and progress regardless of the circumstances.

Akarsh Kainth

Ålesund, September 2022

ABSTRACT

International financial reporting standards (IFRS) are widely used standards known to improve transparency, financial reporting quality, and the comparability of financial reports. Since the mandate of IFRS by the EU in 2005, academics and scholars have extensively researched the effects of adopting IFRS on capital markets with regards to returns. Conversely, few studies have focused on the role of paradigms and theories in explanation of the phenomena in financial accounting research, and those that do exist provide only limited insights into the scientific and philosophical basis of the research stream. As such, this thesis studies the effects of adopting IFRS on capital markets, with respect to the risk element of informational efficiency, and provides a review of the conceptual formation and the role of theories in explanation of the phenomena within this research stream.

Past research painted IFRS as significantly benefiting adopting firms and countries by improving transparency, lowering the cost of capital, increasing firms' following by foreign analysts, improving the comparability of financial reports, and improving the administration of cross-country investments. While many academics have addressed these issues with respect to the impact of IFRS on stock returns and firms' cost of capital, few studies have focused on the effects of adopting IFRS on the risk element of informational efficiency and the philosophical and scientific basis of financial accounting research.

This thesis thus addresses the impact of IFRS adoption on bankruptcy prediction, the systematic risk of firms, and the abnormal stochastic volatility of firms during mergers and acquisitions (M&As) and provides insights into the conceptual formation and the role of theories within the research stream. First, Chapter 3 of this thesis documents the benefits of adopting IFRS for creditors through bankruptcy prediction for a sample of privately held Swedish and Norwegian companies. Second, Chapter 4 argues that the use of IFRS appears to have reduced the systematic risk of the common stock for firms listed on the Norwegian Stock Exchange. Chapter 5 focuses on the informational role of IFRS during M&As by examining their impact on the abnormal volatility generated during such events. A significant relationship is found between IFRS adoption and abnormal stochastic volatility. Finally, Chapter 6 offers useful insights related to the conceptual formation and the role of theories in explaining the phenomena investigated in IFRS-based financial accounting research and provides perspectives and recommendations for future research within this field.

SAMMENDRAG

Internasjonale regnskapsstandarder (IFRS) er kjent for å forbedre transparens, kvalitet på finansiell rapportering og internasjonal sammenstilling av finansielle rapporter. Siden EU innførte krav om bruk av IFRS i 2005, har akademikere og forskere forsket mye på effektene av å adoptere IFRS på kapitalmarkedene med hensyn til avkastning. Derimot, har få studier forsket på rollen til paradigmer og teorier i forklaringen av fenomener innenfor finans og regnskap, og de som finnes gir begrenset innsikt i den vitenskapelige og filosofiske basisen i fagområdet. Avhandlingen studerer derfor effektene av å adoptere IFRS på informasjonseffisiens i kapitalmarkedene, spesiell med hensyn til risikoelementet. I tillegg gir avhandlingen en gjennomgang av den konseptuelle dannelsen og rollen til teorier i forklaringen av fenomenene innenfor IFRS basert finansregnskap.

Tidligere forskning beskriver IFRS som fordelaktig for selskap og land som adopterte dem, ved å forbedre transparens, senke kapitalkostnadene, øke selskapenes oppfølging av utenlandske analytikere, forbedre sammenstillingen av finansielle rapporter og forbedre forvaltningen av investeringer på tvers av land. Mens mange akademikere har studert disse effektene med hensyn til virkningen av IFRS på aksjeavkastning og selskapenes kapitalkostnader, har få studier studert effektene av å adoptere IFRS på risikoelementet av informasjonseffisiens og den filosofiske og vitenskapelige basisen i fagområdet finans og regnskap.

Denne avhandlingen tar derfor opp effekten av å adoptere IFRS på konkursprediksjoner, systematisk risiko for aksjer, og unormal stokastisk volatilitet for bedrifter under fusjoner og oppkjøp og gir innsikt i den konseptuelle dannelsen og rollen til teorier innen fagområdet. Først dokumenterer kapittel 3 i denne avhandlingen fordelene med å bruke IFRS for kreditorer gjennom konkursprognoser for et utvalg av private svenske og norske selskaper. Kapittel 4 argumenterer for at bruken av IFRS ser ut til å ha redusert den systematiske risikoen for vanlige aksjer for selskaper notert på Oslo Børs. Kapittel 5 fokuserer på den informasjonsmessige rollen til IFRS under fusjoner og oppkjøp ved å undersøke den unormale volatiliteten under slike hendelser. Det er en statistisk signifikant sammenheng mellom adopsjon av IFRS og unormal stokastisk volatilitet. Til slutt gir kapittel 6 nyttige innsyn knyttet til den konseptuelle dannelsen og rollen til teorier i forklaringen av fenomenene som undersøkes i IFRS-basert finansiell regnskapsforskning, og gir perspektiver og anbefalinger for fremtidig forskning.

TABLE OF CONTENTS

Chapter 1

IFRS-based Financial Accounting Research

1. INTRODUCTION

International financial reporting standards, which are widely used for financial reporting purposes, are known to have improved the quality and comparability of financial reports. Since the mandate of IFRS by the European Union (EU) in 2005, many studies have focused on the effects of their adoption on the cost of capital, stock returns, the comparability of financial reports and the efficiency of capital investment (Florou et al., 2017; George et al., 2016; Lambertides & Mazouz, 2013). Conversely, few studies have explored the role of paradigms and theories – the building blocks of research – in explaining the phenomena in financial accounting research (Baldvinsdottir et al., 2010; Bisman, 2010; Lukka, 2010; Lukka & Modell, 2010; Ryan et al., 2002). As such, this thesis extends existing IFRS-based financial accounting research by studying the impact of IFRS adoption on the risk dimension of the adopting firms and by providing a review of the conceptual formation and the role of theories in explaining the phenomena within this research stream.

In recent years, demand for transparent financial reporting has risen sharply. The accelerating globalization of the marketplace has caused our world to become increasingly integrated, which makes transparent and harmonious financial reporting more crucial than ever. In this scenario, investors must constantly compare financial information; without any similarities in the underlying methodologies of financial reports, it can be difficult to separate real economic differences from alternative accounting systems and procedures.

To harmonize and minimize international differences in accounting standards, the International Accounting Standards Board (IASB) developed financial reporting standards that can be utilized in many countries. Indeed, the IASB has been successful in establishing international financial reporting standards (IFRS) as globally accepted accounting standards, with over 115 countries permitting or requiring such standards for financial reporting purposes (IFRS Foundation, 2021c).

To contribute to transparent and harmonious financial reporting, the European Union (EU) adopted regulation 1606/2002,[1] which required it to adopt international financial reporting standards (IFRS) and was subsequently enacted into law by the European Parliament on September 11, 2002. The intentions behind this regulation and IFRS adoption are to improve reporting quality and the comparability of financial statements across countries. This led the EU to mandate the use of IFRS by all companies listed on major European stock exchanges for financial reporting purposes from 2005 onwards (George, Li, & Shivakumar, 2016).

One of the greatest successes of IFRS has been its global adoption; firms in over 100 countries currently report under, or at least closely link their accounting standards to, IFRS. This nearly global adoption of IFRS has provided researchers an unprecedented opportunity to study the consequences of adopting IFRS across international regimes. Moreover, it has raised interest in cross-country accounting research and increased the involvement of researchers from across the globe. This led to the rise in research articles focusing on IFRS adoption (George et al., 2016) and gave rise to IFRS-based financial accounting research.

The majority of studies in IFRS-based financial accounting research focus on the effects of utilizing IFRS on adopting firms and countries (Daske, Hail, Leuz, & Verdi, 2013; Key & Kim, 2020; B. Li, Siciliano, & Venkatachalam, 2021; Louis & Urcan, 2014; Mensah, 2020). These studies show IFRS to benefit these firms in terms of the better comparability of financial reports, lower costs of capital, improved transparency and cross-country investments, and increased following by foreign analysts (George et al., 2016). While such studies offer interesting insights, few attempts have been made to assess the impact of the adoption of IFRS on the risk element of informational efficiency (Bodle, Cybinski, & Monem, 2016; Lambertides & Mazouz, 2013) or to provide a critical analysis of the current state of the field (IFRS-based financial accounting research) in terms of the conceptual formation and the role of theories in the explanation of the investigated phenomena.

Given the current state of the literature within this research stream and the increasing demand for reliable financial information, several opportunities exist for extending our understanding of both the effects of utilizing IFRS on the risk element of informational efficiency and the philosophical and scientific basis of the empirical research within this field. To contribute to filling this gap in the research field, this thesis studies the effects of using IFRS on companies' risk and simultaneously provides a preliminary review of the conceptual formation and the role

[1] The Council of Ministers of the EU adopted this regulation on June 7, 2002.

of theories in explaining the investigated phenomena within IFRS-based financial accounting research. More specifically, this thesis examines the impact of adopting IFRS on the systematic risk and return of the common stock, bankruptcy risk, and abnormal volatility generated during mergers and acquisitions (M&A) announcements, using data from Norwegian and Swedish companies, and simultaneously provides preliminary insights into the conceptual formation and the role of theories in the explanation of phenomena associated with IFRS-based financial accounting research.

2. IFRS – HISTORY AND BACKGROUND

2.1 IFRS – HISTORY AND DEVELOPMENT

The history of IFRS dates back over 40 years. The International Accounting Standards Committee (IASC), established by accountancy bodies representing 10 countries, issued the first set of international accounting standards (IAS) in 1973 (IFRS Foundation, 2021c). The IASC was later replaced by International Accounting Standards Board (IASB) in 2001, with the purpose of bringing convergence between national accounting standards by developing global accounting standards (IFRS Foundation, 2021b). During this time, the board adopted the existing IAS, along with the standing interpretations committee standards (SICs) and continued to develop IFRS, which influenced financial reporting practices on a global scale, as evidenced by many countries having adopted or closely linked their reporting standards to IFRS.[2]

The greatest development in the history of IFRS came on 2002, when the European Commission (EC) mandated the use of IFRS for the financial years starting from January 1, 2005, for companies whose securities were traded on a regulated stock exchange. Several other countries, including Australia and Hong Kong, also chose to adopt IFRS around the same period. Later, in 2021, the IFRS Foundation announced the formation of the new International Sustainability Standards Board (ISSB) (IFRS Foundation, 2021a).

The mandatory adoption of IFRS seems to have substantially affected the financial statements of firms. For instance, the 110 companies listed on the Oslo Stock Exchange in 2005 experienced a 17% increase in net income on average, after restating their 2004 financial statements from the Norwegian generally accepted accounting principles (GAAP) to IFRS (Gjerde, Knivsflå, & Sættem, 2008). Another example involves UK firms, among which the

[2] For more details on the history and development of IASC and IASB, the reader is referred to (Zeff, 2012).

local GAAP have been viewed as similar to IFRS. For instance, Vodafone showed a net profit of £6.5 billion based on IFRS in 2005, compared to a net loss of £6.9 billion under UK GAAP. These examples demonstrate that the financial statements made under IFRS differ from local GAAP (George et al., 2016). This indicates that IFRS have considerably impacted the financial reporting of firms and thus the informational efficiency of financial markets.

2.2 IFRS ADOPTION: OBJECTIVES AND RATIONAL

The two most often stated objectives for adopting IFRS are to enhance reporting quality and to improve the comparability of financial statements across countries. These objectives align with the IFRS Foundation's mission statement, which states that "IFRS bring transparency by enhancing the international comparability and quality of financial information, enabling investors and other market participants to make informed economic decisions" (IFRS Foundation, 2021c). European Parliament's Regulation 1606/2002 that required the EU to adopt IFRS also shares a similar view, in stating that the intention behind adopting IFRS was to "achieve a high degree of transparency and comparability of financial statements and hence an efficient functioning of the EU Community capital market and of the Internal Market" (George et al., 2016).[3]

In line with the abovementioned objectives, the IFRS Foundation states that its main purpose of work is "to develop IFRS standards that bring transparency, accountability and efficiency to financial markets around the world" by "helping investors to identify opportunities and risks across the world, thus improving capital allocation" (IFRS Foundation, 2021c). This implies that the purpose is to develop regulations to increase the degree of trust among financial market participants and improve the transparency in financial reporting by providing relevant information in a timely manner. This thesis builds upon the abovementioned premises and addresses the impacts of IFRS adoption on the risk and transparency of financial markets.

3. LITERATURE REVIEW AND GAPS IN THE EXISTING LITERATURE

3.1 LITERATURE REVIEW

The majority of IFRS-based financial accounting research focuses on the objectives in the European Parliament's Regulation 1606/2002, which required the EU to adopt IFRS. In line with the intention behind the regulation, many research articles focus on the effects of adopting

[3] For more details on the Regulation 1606/2002 the reader is referred to European Commission webpage: https://ec.europa.eu/info/law/international-accounting-standards-regulation-ec-no-1606-2002_en

IFRS on the cost of capital, transparency, cross-country investments, the comparability of financial reports, and the firms' following by foreign analysts (George et al., 2016). Given the scope of the thesis, the review of literature on the effects of using IFRS on cost of capital, transparency, and cross-country investments is provided.

3.1.1 IFRS ADOPTION AND THE COST OF CAPITAL

The quality of accounting information is linked to the cost of capital through estimation risk and information asymmetry, both of which fall into the category of information risk. Estimation risk refers to investor uncertainty about the parameters (such as payoff distribution) of the return, while information asymmetry refers to the risk faced when dealing with better informed traders/parties. Increasing information by providing more precise disclosures can decrease estimation risk and information asymmetry, which lowers the information risk and thus decreases the cost of capital (Coles & Loewenstein, 1988; Diamond & Verrecchia, 1991; Easley & O'Hara, 2004).

The abovementioned theoretical predictions suggest that the adoption of IFRS should improve stock liquidity because it improves the information quality provided to market participants. However, the effects of IFRS adoption on the cost of capital are ambiguous (George et al., 2016).

Some of the earliest evidence of the associations between the choice of accounting standards and the cost of equity capital is provided by Daske (2006). Using a sample of German firms between 1993–2002, the author finds no indication of whether the cost of equity capital is lower for firms reporting under IFRS than under German generally accepted accounting principles (GAAP). Contrary to the theoretical predictions mentioned at the beginning of this section, the author finds that the cost of equity capital increases when firms adopt IFRS. Because firms are free to choose how they implement new accounting standards, Daske et al. (2013) re-examine the issue by incorporating reporting incentives and behavior around the time of adoption. Based on an international sample of voluntary adopters of international accounting standards (IAS) between 1990–2005, the authors find no effects on the cost of capital for voluntary adopters. However, after incorporating reporting incentives in their model, they find that firms serious in adopting IAS experience declines in their cost of capital. Hence, they conclude that adopting IFRS does not necessarily lead to declines in the cost of capital, unless the reporting incentives of the firms are aligned.

Daske, Hail, Leuz, and Verdi (2008) study the effects of mandatory IFRS adoption on the cost of capital using panel data for mandatory IFRS adopters from 26 countries from 2001–2005. They find a significant improvement in liquidity and an increase in the cost of capital, when compared to non-IFRS users. However, when studying the effects of adopting IFRS one year prior to the adoption, the authors report a decrease in the cost of capital by 26 basis points. They attribute this increase to the benefits of IFRS adoption being reflected in the stock prices as soon as they are anticipated. It also remains unclear as to why the cost of capital actually increased upon IFRS adoption, given that information risk decreases. The authors also document that the benefits pertain to those countries that have strict enforcement regimes and where firms have incentives to be transparent.

Following a similar path as Daske et al. (2008), S. Li (2010) studies whether the mandatory adoption of IFRS had any impact on the equity cost of capital. Using difference in difference analysis and a sample of 1,084 EU firms, the author concludes that the mandatory adoption of IFRS reduced the cost of equity capital by 47 basis points. Moreover, the author also finds that only firms in countries with strong legal enforcement benefit from reductions in the cost of equity capital.

Recent studies have touched upon the issues of mandatory IFRS adoption and the cost of capital. For instance Moura, Altuwaijri, and Gupta (2020) investigate whether the mandatory adoption of IFRS has impacted the long-term cost of capital (both debt and equity cost of capital). Analyzing a sample of non-financial service firms listed on five Latin American stock exchanges, the authors find that the mandatory adoption of IFRS resulted in a reduction in cost of capital and helped in mitigating information asymmetry. Like Moura et al. (2020), Saha and Bose (2021) examine the association between IFRS disclosure requirements and the cost of capital. Based on a sample of 157 publicly listed Australian firms, they find a negative association between IFRS adoption and the cost of capital. They conclude that firms with a high level of discourse under IFRS have a lower weighted average cost of capital. In a closely related work, Kim and Ryu (2018) examine the impact of mandatory IFRS adoption on the cost of equity capital on publicly listed Korean firms. Based on a sample of 1,658 firm-year observations spanning 2000–2013, the authors report a negative relationship between mandatory IFRS adoption and the cost of equity capital. Moreover, the authors state that these effects were more pronounced for firms with high earnings transparency and confirm that the effects of IFRS adoption depend on the incentives for financial reporting of each firm. In the context of European Union countries, Saleh, Aboud, and Eliwa (2022) examine the quality of

segment reporting information after the adoption of IFRS 8 in 18 European Union countries. The authors first construct a new comprehensive measure of the quality of segment reporting using four dimensions (segment information quantity, segment information disaggregation, cross segment variability, and segment information consistency) and then investigate whether segment reporting quality had an impact on the cost of capital after the adoption of IFRS 8. Using a sample of the top 884 firm-year observations of non-financial EU firms, based on a *Financial Times* list spanning 2007–2011, the authors fail to find any significant relationships between IFRS 8 adoption and the cost of capital.

In conclusion, the studies mentioned above reveal that the mandatory adoption of IFRS decreases the cost of capital. However, this decline has not been experienced equally by all firms or within all countries. Rather, it appears to depend on firm-level reporting incentives and enforcement within the adopting countries.

3.1.2 THE ADOPTION OF IFRS AND TRANSPARENCY

Financial reports are transparent if they allow the user to understand the firm's financial position and performance, which helps in building trust among financial market participants. Financial transparency cannot be measured directly; however, one can measure transparency indirectly by studying other phenomena that could be considered as providing evidence on transparency. The three major research areas that can shed light on the transparency of financial reporting are accounting quality, value relevance, and investment analysts' forecasting ability. Other research areas that can aid in doing the same include predicting credit default swap (CDS) spreads, voluntary disclosures, textual content of reports, stock return synchronicity, share trading volume, opinion surveys, and correlations with future cash flows and earnings (Singleton-Green, 2015). The focus of this section is to review the evidence on the three major research areas.

3.1.2.1 IFRS ADOPTION AND ACCOUNTING QUALITY

No consensus exists in the literature on the definition of accounting quality. Despite a large amount of research on the topic, the term is difficult to define, and its definition varies across studies, individuals, projects, and researchers. As such, the definition is usually personalized to the context and aim of the research. The most typical variables used to measure accounting quality are earnings management, income smoothing, timely loss recognition, and earnings persistence (Menicucci, 2020; Singleton-Green, 2015).

Cadot, Reazee, and Chemama (2020) study the effects of IFRS adoption on earnings management and derivative reporting, and specifically the impacts of IFRS 10, 11, 12, and 13 on earnings management. The authors analyze the firms in the Eurostoxx 600 index over the period of 2013–2014 and conclude that the adoption of IFRS has reduced earnings management and improved the accounting quality. Similarly Salewski, Teuteberg, and Zülch (2014) investigate the impact of IFRS adoption on disclosure quality and the earnings management of German firms. Using a sample of 4,092 firm-year observations spanning 1995–2012, they find that IFRS adoption has resulted in an increase in earnings management and disclosure quality. Hence, it is difficult to draw any conclusions from the evidence they present. Furthermore, Christiansen, Lee, Walker, and Zheng (2015) also study the impact of IFRS adoption on the accounting quality of German firms in terms of earnings management, timely loss recognition, and value relevance for the period of 1993–2006. They find no clear evidence on whether IFRS adoption resulted in any improvement of accounting quality.

Studies that use mixed samples and examine the issue of IFRS adoption and accounting quality report mixed findings. Capkun, Collins, and Jeanjean (2016) use a sample of 3,853 EU and non-EU firms from 29 countries over the period of 1994–2009 and find an increase in earnings management following the mandatory adoption of IFRS in 2005. They further report that the extent of earnings management depends on the flexibility of the local GAAP. Expanding on this issue, Cai, Rahman, and Courtenay (2014) report an increase in earnings management for 4,795 mandatory adopters from 31 countries over the period of 2000–2009. However, this increase is experienced by firms only in the first year after adoption. Furthermore, the authors divide the sample based on the level of enforcement and divergence between IFRS and local GAAP. They do not report any significant results. Similar to the abovementioned studies, Doukakis (2014) also reports no significant impact on earnings management practices post-IFRS adoption for 13,295 firm-year observations from 22 countries.

Recent studies have primarily used changes in net income and earnings management (in addition to earnings persistence and timely loss recognition) as measures of accounting quality (Singleton-Green, 2015). For instance, Key and Kim (2020) investigate the impact of the adoption of IFRS on the earnings management of Korean firms. Using a sample of 439 non-financial firms and 4,390 firm-year observations spanning 2000–2011, they find evidence of less earnings management and timely loss recognition, which indicates improvements in accounting quality. In a similar vein, Gu (2021) finds that the adoption of IFRS reduces income smoothing and improves accounting quality for listed Japanese firms using a matched sample

of 4,414 firm-year observations. Contrary to the abovementioned studies, Fuad, Juliarto, and Harto (2019), using a sample of 423 Indonesian firms, find inconclusive evidence on the effects of IFRS adoption on accounting quality. They report increases in income smoothing, earnings persistence, and timely loss recognition.

In conclusion, the abovementioned studies provide an unclear picture of the effects of the adoption of IFRS on accounting quality. No obvious explanation exists for these divergent findings, except that they may reflect differences in samples, periods covered, or methodology.

3.1.2.2 IFRS ADOPTION AND VALUE RELEVANCE

Another way of assessing the transparency of financial reporting is through assessing its value relevance. If any correlations exist between financial reporting information and stock market returns, it can be deemed value relevant. Hence, the higher the correlation, the more value relevant the financial reporting, assuming that changes in stock markets are reflection of economic reality (Singleton-Green, 2015).

Along these lines, recent studies have found financial reports under IFRS to be value relevant. Nijam and Jahfer (2018) measure value relevance in terms of book value of equity per share (BVEPS) and earnings per share (EPS). Using a sample of 188 Sri Lankan firms listed on the Colombo Stock Exchange, the authors report a positive relationship between market value per share (MVPS) and BVEPS and EPS post IFRS adoption. Proceeding similarly as Nijam and Jahfer (2018), based on a sample of non-financial firms listed on a Saudi stock exchange, Alomair, Farley, and Yang (2021) find no significant difference between the value relevance of Saudi GAAP and IFRS. However, the authors report a positive change in the value relevance of BVEPS post IFRS adoption and attribute this to the fair value requirements under IFRS. In a similar vein, Odoemelam, Okafor, and Ofoegbu (2019) investigate the value relevance of earnings. Using a sample of 101 listed Nigerian firms that adopted IFRS from 2006–2017, they find earnings under IFRS to be value relevant. Barth, Landsman, Young, and Zhuang (2014) investigate the book value and net income adjustments to IFRS for 2004 in the context of 15 European countries. The authors use 276 financial firms and 925 non-financial firms. In contrast to Kouki (2018), the authors find that the adjustments are value relevant and significantly positively related to share prices.

Conversely, some studies find weak or no relationships between IFRS adoption and value relevance. For instance, similar to the abovementioned studies, Kouki (2018) uses BVEPS and EPS to examine the impact of adopting IFRS on value relevance. Using a sample of 1,166 firm-

year observations of European companies, the author finds increased value relevance under IFRS. The result is, however, statistically insignificant. Similarly, Christiansen et al. (2015) find no change in value relevance when using IFRS instead of German GAAP. Furthermore, based on a sample of listed firms from 11 countries, Ates (2021) finds that the adoption of IFRS increased the value relevance of EPS. However, the study reports no significant effects of the adoption on the value relevance of BVEPS.

Some studies have investigated the relationship between the value relevance of intangibles and IFRS adoption and often report lower value relevance when using IFRS. For instance, Ji and Lu (2014) investigated the value relevance of intangible assets, including goodwill and other intangibles in the pre- and post-IFRS adoption periods. Using a sample of listed Australian firms from 2001–2009, they find a positive relationship between value relevance and intangibles. However, the strength of the relationship declined in the post-IFRS adoption period. Later, Paolone, Tiscini, and Martiniello (2020) assessed the issue by focusing on listed Italian firms and found goodwill and research and development expenditures to be value relevant. Similarly, Cordazzo and Rossi (2020) found increased value relevance in goodwill and research and development expenditures, but no value relevance of intangibles as a whole. In contrast to the abovementioned studies, Güleç (2021) reports no change in the value relevance of research and development expenditures under IFRS.

The studies mentioned above reveal differences in their findings on the effects of mandatory IFRS adoption on equity markets. No obvious explanation exists for these differences, except that they could have arisen due to differences in methodology, sample, or time period studied. Moreover, the differences could also arise due to changes in accounting standards over time.

3.1.2.3 IFRS ADOPTION AND FORECASTING ACCURACY

If the financial reporting of a firm is transparent, one should find it easier to forecast its future results. One way to assess this is to examine whether any changes in financial reporting systems lead to improvements in investment analysts' forecasts and forecast dispersion. Improved transparency should lead to the reduced dispersion of forecasts and decrease analyst uncertainty.

Several studies have found that the adoption of IFRS increases the accuracy of analysts' forecasts and also reduces forecast errors. For instance, Horton, Serafeim, and Serafeim (2013) studied the accuracy of analysts' forecasts using a sample of 8,124 firms from 46 countries between 2001–2007. The authors found that IFRS adoption yields better forecasts; however,

the extent of improvement is tied to the difference between IFRS and local GAAP. In a similar vein, Hoque, Easton, and Zijl (2014) examine forecast accuracy and dispersion after mandatory IFRS adoption in France, Germany, and Sweden. The authors chose these countries due to their low investor protection and differing civil law traditions that prevail there. Using a sample of 278 firms between 2003–2011, the authors found significant improvements in forecast accuracy and reduction in forecast errors. They claim that mandatory IFRS adoption improves information quality in countries with low investor protection. Furthermore, Turki, Wali, and Boujelbene (2016) also studied the impact of IFRS adoption on financial analysts forecasts. Based on a sample of listed French companies in the CAC All Tradable Index, they found that the adoption of IFRS resulted in a decrease in forecast dispersion and error and contributed to improvements of analysts' forecasts.

Recent studies have found that financial reporting under IFRS improves forecasting accuracy. Hlel, Kahloul, and Bouzgarrou (2020) study whether the adoption of IFRS improved management earnings forecast accuracy for 45 French firms that made initial public offerings (IPOs) between 2005–2016 in two French financial markets: Euronext and Alternext. They found that using IFRS improves the accuracy of management forecasts and contributes to sustaining shareholder trust in the transparency of financial information. In line with Hlel et al. (2020), using a sample of 5,274 firms (2,805 IFRS adopters and 2,469 non-adopters) from 16 countries, Demmer, Pronobis, and Yohn (2019) found that IFRS adoption resulted in improvements in the accuracy of financial statement-based forecasts, albeit only for those countries that made improvements to their financial regulation enforcement. Later, using a sample of 2,547 firms, Barniv, Myring, and Westfall (2022) also found that IFRS result in more accurate and timely earnings forecasts.

The abovementioned studies reveal that the mandatory adoption of IFRS results in improvements in analyst forecast accuracy. However, these improvements are more pronounced for countries with low investor protection and also depend on the legal traditions prevailing in a given country.

3.1.3 IFRS ADOPTION AND CROSS-BORDER INVESTMENTS

Proponents of IFRS argue that the improved quality and comparability of financial reporting under IFRS should lead to an increase in cross-border investments and the better integration of capital markets. Proponents base these claims on the premise that similar accounting standards

reduce the costs associated with interpreting the local GAAP of other countries and remove significant information barriers (George et al., 2016).

Along these lines, some studies have found positive impacts of using IFRS on cross-border investments. C. J. P. Chen, Ding, and Xu (2014) studied the effects of IFRS on cross-border investments in terms of foreign direct investment (FDI). They used a sample of 30 countries between 2000–2005 and measured FDI as aggregate in- and outflow between pairs of countries. The authors report positive associations between FDI flows and IFRS. However, the effects are stronger for country pairs with larger institutional differences. Márquez-Ramos (2011) uses data on the bilateral exports of goods and FDI in the EU from 2002–2007. The author found that IFRS adoption is beneficial for trade and FDI. However, some EU countries show a decline in FDI when compared to other EU member states. Similarly Gordon, Loeb, and Zhu (2012) cover 124 countries and conclude that overall FDI inflows are positively related with the decision to adopt IFRS.

Several studies have examined the effects of the adoption of IFRS on international portfolio investments. Amiram (2012) examined the impact of the adoption of IFRS on portfolio investments in equities. Using a sample of 104 countries and investment data for 1997 and 2001–2006, the author found that foreign equity portfolio investments increase in countries that adopt IFRS. Moreover, the author claims that the effects are more pronounced when both partners (investor and investee) use similar accounting standards and have similar legal origins and culture. Similarly, Florou and Pope (2012) studied the effects of IFRS adoption on the international holdings of institutional investors. Using a sample of 3,865 firms from 45 countries spanning 2003–2006, the authors found a positive impact of IFRS adoption on the international holdings of institutional investors. The result, however, is more pronounced for active investors and applies mainly to the countries with strong enforcement and reporting incentives. Moreover, the result also depends on the divergence between IFRS and local GAAP. L. Chen, Ng, and Tsang (2015) also studied the effects of IFRS adoption on international portfolio investments in terms of international cross-listings. They used a sample of 1,232 cross-listings and found that mandatory adopters are most likely to cross-list following the adoption of IFRS. Moreover, they state that a high probability exists that firms from mandatory adopting countries will cross-list in those countries that also mandate the use of IFRS.

The adoption of IFRS also appears to have impacted merger and acquisition (M&A) activity. Several studies that examine this topic have found that IFRS adoption positively impacts cross-border M&A. For instance, Louis and Urcan (2014) argue that using identical accounting standards should simplify the M&A process and post-acquisition integration, which should lead to an increase in the cross-border acquisitions of IFRS reporting entities. Consistent with these predictions, the authors found a higher likelihood of cross-border acquisitions among listed firms in IFRS-adopting countries. They base their findings on a sample of 885 acquisitions of listed firms announced between January 2000 and December 2010. In a similar vein, Francis, Huang, and Khurana (2016) report an increase in the volume of cross-border M&A transactions between countries with similar accounting standards. The authors base their results on a sample of cross-border M&A form 32 countries between 1998–2004 and state that the mandatory adoption of IFRS resulted in more cross-border M&A among IFRS-adopting countries. Relatedly, Loureiro and Taboada (2015) found an increased likelihood of deal completion and an improvement in post-acquisition returns and operating performance. In a later study, Yip, Liu, and Young (2019) examined the role of accounting information and the adoption of IFRS on M&A activity. Using a sample of cross-border and within-country M&A from 19 countries, the authors found an increase in the likelihood that IFRS adopters would complete a cross-border M&A. They also report increased abnormal returns of acquirers that are IFRS adopters.

The abovementioned studies reveal that the adoption of IFRS has positively impacted cross-border investments in terms of FDI, international portfolio investments, and cross-border M&A alike. In some instances, the results appear to depend on the extent of difference between IFRS and local GAAP and the level of enforcement and reporting incentives in selected countries.

3.2 GAPS IN EXISTING LITERATURE

Although the effects of IFRS adoption on capital markets are well documented, some key gaps remain that must be addressed. As noted above, extant IFRS-based financial accounting research has mainly focused on the effects of adoption on capital markets with regards to financial stock returns and earnings management. Furthermore, several studies have used bid-ask spread, cost of capital, and future cash flows to address those effects (George et al., 2016). Issues remain, however, such as the effects of adopting IFRS on the risks of the companies that have not been extensively addressed in the extant research. The knowledge about risk in financial markets is an extremely important issue for market participants. The risk of any given

financial instrument also reacts to the information that is emitted to the market. As financial reports form a part of the information, more research is needed to study the effects of financial reporting on the risk in financial markets.

The studies mentioned above have addressed transparency of IFRS standards by examining their impact on accounting quality, value relevance, and forecast accuracy (Singleton-Green, 2015). However, transparent financial reporting should also aid in predicting bankruptcy and default. While the abovementioned studies offer interesting insights, few attempts have been made to assess the impact of IFRS on transparency through bankruptcy and default prediction. For instance Charitou, Karamanou, and Lambertides (2015) studied the impact of the mandatory adoption of IFRS on default risk and found that the use of IFRS helped detect those firms at a high risk of default. Conversely, Bodle et al. (2016), investigated the issue of IFRS and bankruptcy prediction in the context of listed Australian firms and found that accounting numbers based on IFRS predicted bankruptcy better than those based on Australian GAAP. Hence, studying the issues raised within these articles in other settings, such as by using privately held firms as a sample, can provide important new insights for practitioners and the research field.

A limited number of studies offer insights into the effects of IFRS adoption on cross-border investments and M&A. As mentioned above, the main focus of these studies is on the impact of the adoption of IFRS on the volume of M&A, post-acquisition performance, and the abnormal returns generated on the M&A announcement date. However, the issues related to the adoption of IFRS on the risk and volatility during M&A have generally been neglected by extant research. Hence, knowledge on how financial reporting can help manage risks during M&A will contribute greatly to the literature and simultaneously aid practitioners in formulating optimal trading and hedging strategies. Moreover, such information will also aid market participants in the assessment of M&A deals.

Finally, it is important to have some knowledge of the philosophical research tradition and paradigms in any given research field, as these components can tell a great deal about the authors' way of thinking and the types of methods utilized in the research area. Along these lines, some studies have attempted to provide an overview of the traditions and paradigms in financial accounting research (Bisman, 2010; Ryan, Scapens, & Theobald, 2002), while the majority of other studies have addressed the shift from a post-positivist to critical realist paradigm in financial accounting research and focused on the role of paradigms in management

accounting research (Baldvinsdottir, Mitchell, & Nørreklit, 2010; Lukka, 2010; Lukka & Modell, 2010). The extant research appears to have paid no attention to the role of inductive or deductive reasoning in developing the theory and conceptual apparatus used in IFRS-based financial accounting research. Studying these issues would therefore enrich the existing body of literature by providing insights into these topics, which are essential to understanding the basis of the research conducted in the research field.

4.0 MOTIVATION, OBJECTIVES, AND STRUCTURE OF THE THESIS

In line with the IFRS Foundation's primary working aim and the abovementioned research gaps, the purpose of this thesis is to contribute to and reconcile the findings of the literature on the impact of IFRS adoption on transparency and informational efficiency in capital markets, credit risk, and equity pricing, as well as to suggest different perspectives, research paradigms, and concepts that researchers can utilize to gain an in-depth understanding of the regulatory, economic, social, and political effects and usages of accounting.

These issues are addressed in the subsequent chapters of this thesis via the impact that adopting IFRS has on the systematic risk of common stock, bankruptcy prediction, and abnormal stochastic volatility (SV) of companies during M&As. Chapter 6 offers a review of the literature on the conceptual formation and the role of theories in the explanation of the phenomena studied in IFRS-based accounting research.

First, this thesis focuses on the impacts of IFRS adoption for creditors and the standards' role in bankruptcy prediction and provides evidence of improved transparency and the benefits of aligning national accounting standards toward IFRS by using a sample of privately held Norwegian firms, using Norwegian GAAP, and privately held Swedish firms, using IFRS.

Second, this thesis argues that IFRS adoption seems to have reduced the systematic risk of common stock, which aligns with several studies that claim that IFRS adoption has reduced firms' cost of capital (George et al., 2016). The underlying premise is that market betas and stock prices are influenced by investors' expectations and that the accounting reports form a part of these expectations. In contrast to previous research focusing on the impact of IFRS adoption on stock market returns or the cost of capital, this thesis focuses on the impact of adoption on the market betas (systematic risk) of common stocks.

Previous studies have utilized returns of common stock to assess the impact of IFRS adoption on abnormal returns generated during M&As; conversely, this thesis addresses the impact of

IFRS adoption on the SV of firms during M&As. More specifically, we assess the impact of IFRS adoption on the abnormal SV of Norwegian and Swedish firms during M&As, which, to the best of our knowledge, is a novel issue.

Finally, this thesis focuses on the conceptual formation and the role of theories in explanations within this IFRS-based financial accounting research – an area that has received negligible attention to date. We offer a review of how concepts are constructed and defined, describing the functions of the concepts within this research stream, and provide recommendations for future research.

The rest of the thesis is organized as follows: the next section provides a summary of Chapters 3–6. Chapter 2 addresses the theoretical background and the research methodology of the thesis. Chapter 3 focuses on the impact of IFRS on financial reporting transparency through the perspective of bankruptcy prediction. Chapter 4 addresses the issue of the impact of IFRS on the systematic risk of the common stock of the companies listed on the Norwegian Stock Exchange. Chapter 5 offers insights into the impact of IFRS adoption on the risk and stochastic volatility (SV) of firms during M&A, while Chapter 6 provides a preliminary review of the conceptual formation and the role of theories in explaining the phenomena studied in IFRS-based financial accounting research. Finally, Chapter 7 presents a discussion and concludes the thesis.

5.0 SUMMARY OF THE CHAPTERS

This section provides the summary of the chapters 3 – 6 included in this thesis as well as their contributions.

Chapter 3: Do IFRS Promote Transparency? Evidence from the Bankruptcy Prediction of Privately Held Swedish and Norwegian Companies.

This chapter is published in the *Journal of Risk and Financial Management* with the same title and is available at https://doi.org/10.3390/jrfm14030123. The version presented here contains some minor revisions. The article is co-authored with Ranik Raaen Wahlstrøm, Associate Professor in NTNU Business School in Trondheim, Norway.

The purpose of this article is to determine and assess whether financial reporting under IFRS can predict bankruptcy better than local GAAP. Specifically, we investigate whether any differences between Norwegian GAAP and IFRS can affect the transparency of financial reporting through bankruptcy prediction. Considering the extensive usage of fair values and

increased disclosure requirements, we expect that the usage of IFRS will lead to a change in bankruptcy prediction.

Utilizing a comprehensive sample of 2,290,551 financial statements based on Norwegian GAAP and IFRS we find that financial reporting under IFRS appears to provide better bankruptcy predictions than Norwegian GAAP. The findings suggest that IFRS improve transparency and can aid in preventing managers from "window dressing" their accounts or engaging in creative accounting practices to hide the true situation of their company. The study also has implications for standard setters by providing evidence that abandoning strict practices can impact bankruptcy prediction. Overall, the study provides a picture of the benefits of IFRS for creditors.

Chapter 4: The Role of IFRS Accounting Fundamentals in Predicting the Market Risk and Return of the Common Stock – The Case of Companies Listed on the Oslo Stock Exchange

This chapter (with the same title) is published in book titled "*Modeller, Fjordantologien 2019"* and is available at https://doi.org/10.18261/9788215034393-2019-07. The version presented here contains some minor revisions.

This chapter explores the relationship between IFRS based accounting variables, market price, and risk variables. The main objective is to determine whether the usage of IFRS for financial reporting purposes can produce information efficiency for market participants in stock returns and market risk. Accounting betas and theories from the literature that attempt to find connections between the market risk and accounting variables are utilized to derive a model that evaluates the relationships between the selected accounting variables and the systematic risk of common stock. Accounting betas are estimated in a similar manner as security betas.

The study finds that adopting IFRS has resulted in reducing the systematic risk of common stock and that accounting betas are a significant predictor of the systematic risk; however, their predictive power is low. This could be due to a significant amount of error, as they are estimated utilizing yearly data. The degree of financial leverage is also found to be a significant predictor of systematic risk, although its predictive power is low. The study, however, fails to find support for the degree of operating leverage. The findings of this article should be interpreted with caution, as other confounding events could have affected the systematic risk of the common stock.

The paper contributes to IFRS based accounting research that assesses the impact of IFRS adoption on the market risk (Barth et al., 2008; Li, 2010) and contributes to the efforts of researchers who have been attempting to connect market and accounting risk measures.

Chapter 5: The Role of IFRS Adoption in Predicting Volatility During Mergers and Acquisitions: Evidence from Sweden and Norway

This chapter was co-authored with Per Bjarte Solibakke at Norwegian University of Science and Technology (NTNU). The chapter was presented at the Financial Management and Accounting Research Conference (FMARC) in Limassol, Cyprus on June 2022. We are considering sending the chapter for publication soon.

In the context of this thesis, the chapter contributes to the informational role of using IFRS during M&As. First, we utilize the SV model approach to compute the stochastic volatility of companies involved during M&A. Second, we employ the event study methodology and compute the cumulative abnormal SV during a specified window around the M&A announcement date. Third, we utilize cross-sectional analysis to assess the impact of IFRS adoption on the cumulative abnormal SV.

The findings of our study are twofold. First, the volatility of companies during M&As begins to rise three days prior to the announcement date. After the event date, the volatility returns to pre-event levels. This suggests that the markets appear to be efficient because the new information is reflected in the volatility of the firms. Second, IFRS adoption impacts the volatility of the stocks during such events. This finding provides evidence to support the informational role of IFRS based accounting reports. This probably indicates that the relevant stakeholders can benefit from IFRS based financial reporting, which is claimed by the literature to be of superior quality than local GAAP (George et al., 2016) . We base our findings on the sample of 56 M&As from Norway and Sweden.

Chapter 6: Conceptual Formation and Explanation in IFRS Based Financial Accounting Research

This chapter is published in *Cogent business and management* with the same title and is available at https://doi.org./10.1080/23311975.2021.1935185. The version presented here contains some minor revisions. It was co-authored with Ghulam Mustafa, Associate Professor in the Department of International Business at NTNU in Ålesund. This chapter provides a

critical analysis of the research field regarding conceptual formation and the role of theories in explanation.

The mandatory adoption of IFRS in 2005 resulted in a surge in the number of academic articles that study the effect of IFRS based financial reporting on the capital markets. In contrast to the majority of studies within the research field, this paper is conceptual in nature and provides preliminary insight into the conceptual construction and the role of theories in explaining the phenomena within IFRS based financial accounting research, which is an area that has received negligible attention.

Utilizing a sample of eight articles, we find that the majority of the IFRS based accounting research is conducted within a positivist paradigm and utilizes concepts from existing research. The central phenomena examined in this research field is the effect that adopting IFRS has on accounting quality and the information environment. The studies within this research field are strictly empirical, and the concepts are formed in a deductive manner. Moreover, the nature of the explanations seems to be mechanistic.

The chapter includes recommendations for future research: future studies should incorporate the usage of sociological and behavioral concepts to diversify and enhance the fruitfulness of the research field. We further suggest that research could assume the perspective of a critical realist.

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Chapter 2

Theoretical Background and Research Methodology of the Thesis

1. THEORITICAL BACKGROUND OF THE THESIS

Proponents of IFRS deem them to be of higher quality than local GAAP because the former are known to improve transparency through increased disclosures, better cross comparability, and more economically motivated financial reporting. These benifits should thus result in lower information asymmetry, risk and return and contribute to a stable financial market. The thesis takes this as a starting point and utilizes theories from finance literature to address the issues raised in the chapters 3 to 6. The purpose of this section is to provide a brief description of the theories utilized in this thesis.

The third chapter of this thesis utilizes theories from the bankruptcy prediction literature that date back to Altman (1968), who utilized accounting-based variables to predict bankruptcy. Considering the context of the chapter, we also utilize the variables in the SEBRA model, which was developed by the Central Bank of Norway (Bernhardsen & Larsen, 2007), as it is suited to bankruptcy prediction in privately held companies in the Swedish and Norwegian contexts (Paraschiv et al., 2021).

The fourth chapter of this thesis utilizes the theories that connect the market and accounting measures of risk that date back to the seminar works of Ball and Brown (1968) and Ball and Brown (1969), in which the authors attempted to connect the accounting-based income numbers to the market risk and address the implications of portfolio theory for accounting. They found that accounting-based income numbers explain approximately 35–40% of the variation in systematic risk. Building upon their work, Beaver et al. (1970) found accounting betas, dividend payouts, and the measurements of earnings variability to be associated with the systematic risk of the common stock. Later, Bowman (1979) stated that systematic risk is related to the firm's growth, size, leverage, and accounting beta. Mandelker and Rhee (1984) found that a company's degree of operating and financial leverage explain a significant portion of the variation in the systematic risk of common stock. Mensah (1992) extended their models, finding that accounting measures can explain the systematic risk of common stock. This approach is further utilized in the fourth chapter of this thesis to address the impact of IFRS adoption on the systematic risk of common stock.

It is well known that stock prices react to news and announcements released in the market. The extent of stock price reactions to such news is estimated using event study methodology, as in (Brown & Warner, 1985), wherein the cumulative stock returns are estimated throughout the event window and then compared with the returns in the scenario where no news was emitted to the market. The fifth chapter in this thesis applies this approach in context of the merger and acquisition announcements and assesses the impact of IFRS adoption on the risk (measured using stochastic volatility) generated during these announcements. The change in information quality due to IFRS-based financial reporting allows one to expect the abnormal SV to reflect this information.

This thesis also utilizes the differences between Norwegian GAAP and IFRS to formulate the research questions. The financial statement numbers differ under the two accounting standards, typically in the accounting for intangibles – especially goodwill, which, under IFRS, is tested annually for impairment rather than being amortized. These differences are mentioned and elaborated in Chapters 3 and 4 of this thesis. Because of these differences and the many cited benefits of IFRS, it is reasonable to expect that IFRS adoption can impact market and credit risk, as well as returns and the volatility of stocks. Furthermore, to limit the influence of cross-country differences on the empirical indicators, the thesis utilizes perspectives from theories offered by Guermazi and Halioui (2020) and Hofstede Insights (2020) in choosing a two-country homogenous sample.

To drive any research stream forward, one must challenge the existing assumptions and paradigms within that research stream. Chapter 6 in this thesis thus builds on the sociology literature to address conceptual formation in IFRS-based accounting research. The chapter assesses whether the concepts in this research stream are defined loosely, constructed in a deductive or inductive manner, and if they follow the approach of Lazarsfeld (1966) (Leiulfsrud & Sohlberg, 2017). This chapter also assesses the types of explanations found in the research articles (for example, mechanistic or functional explanations), as well as the role of theories in the explanations, and suggests alternative paradigms and philosophical perspectives for future research.

2. RESEARCH METHOD

The research method utilized in this thesis is primarily quantitative; additionally, it follows a positivistic and normative approach. According to the distinction provided by Leiulfsrud and Sohlberg (2017) and Hume (1739), positivistic research is concerned with the questions of facts

– in other words, observing *what is* – while the normative appraoch addresses *what ought to be*. Positivistic approach is widely utilized in finance and accounting research and is characterized by hypothesis testing that utilizes statistical and empirical tools (Bisman, 2010; Ryan et al., 2002); this is further outlined in Chapter 6 of this thesis. Chapters 3–5 follow the positivistic approach; they address the issue of the effects of IFRS adoption on credit and market risk. The sixth chapter in this thesis follows a normative approach; it suggests the different perspectives and paradigms that researchers in this field could assume, that is, *what ought to be.*

2.1 EMPIRICAL METHODS, INDICATORS, AND SAMPLE UTILIZED IN THIS THESIS

The empirical methods utilized in this thesis are similar to those employed in mainstream finance research and are guided by financial theory. The third chapter utilizes logistic regression (LR), which was introduced by Ohlson (1980), along with the accounting-based variables from Altman (1968), the SEBRA model, and a sample of privately held firms from Norway and Sweden, to assess the bankruptcy prediction capabilities of financial reporting under IFRS. The model developed by Altman (1968) has proven to perform well across different country contexts, and the SEBRA model was developed for the Norwegian companies. LR was deemed appropriate to address this topic, as this method provides the probability that a firm will go bankrupt based on its financial characteristics, requires less restrictive assumptions than linear discriminant analysis methods, and has found considerable applications in failure predictions (Dimitras et al., 1996, 1999).

The fourth chapter of this thesis studies whether IFRS-based accounting fundamentals and the cyclicality of earnings (measured by accounting betas)[4] can predict the systematic risk of the common stocks listed on the Norwegian Stock Exchange (NSE). Because systematic and accounting risk are latent variables, the two-step approach outlined by Fama and MacBeth (1973) is used to make them observable. Under this approach, the first step requires the computation of market beta estimates from the regressions, similar to market model regressions. A similar procedure is conducted to compute accounting betas using firm earnings.[5] This makes the systematic and accounting risk observable. In the second step, the beta estimates are used in a cross-sectional analysis, along with indicator variables from

[4] Accounting betas are computed in a similar manner as security betas, using the earnings of the firm as inputs.
[5] In order to compute the accounting betas, we also create an index based on earnings in a similar manner as the market indices are constructed.

Mensah (1992), to determine the influence of IFRS-based accounting fundaments on the systematic risk of the common stock.

The fifth chapter of this thesis studies the impact of IFRS adoption on the abnormal stochastic volatility (SV) or risk generated during merger and acquisition (M&A) announcements for Norwegian and Swedish firms. It is well known that the risk of any given entity is unobservable. Hence, to analyze this research problem, the risk estimates of the firms involved in M&A and their respective country indices were first obtained using the SV approach by Andersen et al. (2002) and Solibakke (2020), which specifies the predictive distribution of the price returns indirectly via the structure of the model and utilizes the efficient methods of moments (EMM). In this way, the latent volatility estimates are made observable and can be further used for analysis. Second, given the nature of the research problem, the event study methodology was applied to obtain the abnormal risk estimates around the selected event windows. Event windows were chosen based on the persistence of the volatility following the event date (in this case, the announcement date). Finally, following approaches in the previous literature (Yip et al., 2019), cross-sectional analysis was used to assess the impact of IFRS adoption on the abnormal risk, along with selected independent variables.

The nature of Chapter 6 differs from the remaining ones in that it does not utilize any empirical methods. The chapter is conceptual in nature and provides a preliminary review of the conceptual formation and the role of theories in explaining the phenomena in IFRS-based accounting research. As such, eight articles were chosen that address the impact of IFRS adoption on accounting quality. The studies have been published in economic, accounting, and financial reporting journals and vary in their contexts, as we have included studies focusing on both European and non-European contexts.

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Chapter 3

Do IFRS promote transparency? Evidence from the bankruptcy prediction of privately held Swedish and Norwegian companies[6]

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ABSTRACT

The purpose of this chapter is to investigate whether any differences between International Financial Reporting Standards (IFRS) and local Generally Accepted Accounting Principles (GAAP) impact the transparency of financial reporting of non-listed companies through bankruptcy prediction. This contributes to extant research that has focused on the effects of IFRS adoption in the context of listed companies. For our investigation, we used logistic regression, well-established accounting-based predictors, and a sample of financial statements from privately held Swedish companies using IFRS, and Norwegian companies using Norwegian GAAP. The results indicate that financial statements made under IFRS may be better suited for bankruptcy prediction than those made under Norwegian GAAP. Our findings suggest that the use of IFRS could aid in increasing the informativeness of financial reports by promoting transparency and prevent managers of firms facing insolvency from engaging in creative accounting practices. Our results should, however, be applied with caution, as they may be due to the differences in characteristics across firms that are not captured by our research design. We leave this issue open to future research.

Keywords: IFRS; accounting standards and principles; bankruptcy prediction; transparency; privately held companies; Norwegian GAAP; logistic regression; accounting-based predictors

[6] This chapter is published in the *Journal of Risk and Financial Management* with the same title and is available at https://doi.org/10.3390/jrfm14030123. The version presented here contains some minor revisions. The article is co-authored with Ranik Raaen Wahlstrøm, Associate Professor in NTNU Business School in Trondheim, Norway.

1. INTRODUCTION

Predicting company bankruptcy is at the core of credit risk management and thus important for academics, regulators and practitioners (Bărbută-Misu & Madaleno, 2020). Since the input variables of models used for bankruptcy predicting often are derived from financial statements, it is important that these are transparent. International Financial Reporting Standards (IFRS) are widely used for financial reporting and promote cross-country comparability and more transparency than local Generally Accepted Accounting Principles (GAAP) through the use of fair values and more disclosure requirements (Botosan & Plumlee, 2002; Diamond & Verrecchia, 1991; Fossung et al., 2020; George, Li, & Shivakumar, 2016; International Standards Accounting Board, 2002; Lambert, Leuz, & Verrecchia, 2007; Levitt, 1998). Thus, the use of IFRS can prevent managers from engaging in creative accounting practices in order to mask the credit risk of their companies (Bhat, Gallen, & Segal, 2014; Bodle, Cybinski, & Monem, 2016). All of this should make financial statements based on IFRS more relevant to stakeholders than those based on local GAAP. In this paper, we evaluate this by investigating whether the use of IFRS relative to local GAAP improves the transparency of financial reporting through bankruptcy prediction.

A financial report presents the financial position and performance of a company. When preparing a financial report, the choice of accounting regulations is of great importance, since different regulations yield different accounting figures, resulting in varied perceptions of a company. For example, the 110 companies listed on the Oslo Stock Exchange in 2005 experienced a 17% increase in net income on average, after restating their 2004 financial statements from the Norwegian GAAP (NGAAP) to IFRS, which Gjerde, Knivsflå, and Sættem (2008) argue is mainly due to differences in accounting for goodwill and intangible assets under the two sets of regulations. First, development expenditures are recognized as intangible assets under IFRS, while NGAAP provide a widely used option to expense them immediately. Second, goodwill is subject to amortization under NGAAP, while IFRS require that it be tested annually for impairment. Third, expenditure on brands is recognized as an intangible asset under NGAAP but not under IFRS (Bodle et al., 2016; IFRS Foundation, 2021; Norwegian Accounting Standards Board, 2012; Picker et al., 2016). Given these differences, we expect that the use of IFRS will lead to a change in transparency and thus the assessment of bankruptcy prediction, especially when using accounting-based variables.

We used a comprehensive sample of 2,290,551 annual financial statements from privately held Swedish and Norwegian companies based on IFRS and NGAAP, respectively, spanning the time period of 2006–2018. Furthermore, we predicted company bankruptcy using logistic regression (LR) and the input variables from Altman (1968) and the SEBRA model developed by the central bank of Norway. Our findings suggest that financial statements based on IFRS yield better bankruptcy prediction models, compared to those based on NGAAP, both in terms of in-sample fit and out-of-sample performance.

We contribute to the literature in the following ways. First, our study focuses on the role of accounting standards in bankruptcy prediction—an area which to the best of our knowledge has not been researched extensively. Second, our study is among the few that focus on the benefits of IFRS for creditors while the majority of the existing literature has investigated the effects of IFRS adoption on equity markets, cost of capital, cross country comparability and corporate investment efficiency (George et al., 2016). Third, to the best of our knowledge, we are the first to investigate whether the alleged benefits of IFRS also apply to bankruptcy prediction in the Scandinavian market. Our choice of market thus differs from most studies on bankruptcy prediction, which have used data from the United States of America (Appiah, Chizema, & Arthur, 2015; Bodle et al., 2016). A study related to ours is that of Bodle et al. (2016), which found that financial reporting under IFRS yields better capabilities in terms of bankruptcy prediction models, compared to financial reporting under Australian GAAP. However, the authors used only listed companies, which is, indeed, the convention in the bankruptcy prediction literature (Appiah et al., 2015). By contrast, our analysis of medium- and large-sized privately held Swedish companies is particularly relevant, as such companies can choose to prepare their consolidated financial statements under IFRS. Consequently, IFRS have considerable legitimacy in Sweden (IFRS Foundation, 2016; Marton, 2017).

The rest of this paper is structured as follows. Section 2 reviews the literature on IFRS and their impact on value relevance, forecasting accuracy, credit ratings, and bankruptcy prediction. Section 3 describes the data and sampling choices, and Section 4 describes the research method. The results are presented and discussed in Section 5. Finally, the conclusions are given in Section 6.

2. LITERATURE REVIEW

We review the literature on the impact of IFRS on *i)* value relevance, *ii)* forecasting accuracy, and *iii)* credit ratings and bankruptcy prediction. All of these areas can be regarded as providing evidence on the transparency of financial reporting (Singleton-Green, 2015).

2.1. IFRS and Value Relevance

Financial reports are value relevant if their accounting numbers are correlated with stock market prices. Thus, if the economic reality is reflected in market prices, then value relevant financial reports are transparent, as their accounting numbers will reflect the economic reality. This also results in other benefits, such as an increased comparability of financial reports and improved efficiency of capital markets (George et al., 2016).

Studies have reported that using IFRS rather than local GAAP leads to an increased value relevance of financial reports (Bartov, Goldberg, & Kim, 2005; Singleton-Green, 2015). For instance, Barth, Landsman, and Lang (2008) found that adopting International Accounting Standards (IAS) yields more value relevant financial reports in a sample of 327 adopters and non-adopters across 21 countries in the time period of 1992–2009.[7] Moreover, Horten and Serafeim (2010) suggested that financial reports under IFRS promote more value relevance through the credible communication of bad news, compared to financial reports under UK GAAP.

On the contrary, several studies found a weak relationship or no relationship between IFRS and value relevance. For instance, Hung and Subramanyam (2007) studied a sample of 80 German companies that adopted IAS during the time period of 1998–2002 and found that accounting standards did not have a major impact on value relevance. They found only weak evidence of a higher timeliness of IAS income, compared to local GAAP income, and that IAS adjustments were value relevant for the book value of equity, but not for net income. Furthermore, Oliveira, Rodriguez, and Craig (2010) studied 32 Portuguese companies over the time period of 1998–2008 and found that using IFRS, instead of local GAAP, yields a lower value relevance of earnings, no change in the value relevance of the book value of equity and intangibles, and a higher value relevance of goodwill. In a similar vein, Christiansen, Lee, Walker, and Zheng (2015) and Günther, Gegenfurtner, Kaserer, and Achleitner (2009) found no change in value

[7] IAS are related to IFRS to a high degree. The IAS were published by the International Accounting Standards Committee (IASC) between 1973 and 2000. In 2000, IASC restructured itself into the International Accounting Standards Board (IASB), adopted all the IAS standards, and named the future standards IFRS (IFRS Foundation, 2020).

relevance when using IFRS, instead of German GAAP. Moreover, Ates (2021) used a sample of listed companies from 11 European Union countries and found that the use of IFRS led to increased value relevance of earnings per share and no significant impact on the value relevance of book value per share.

Some studies have found that the value relevance of intangibles is lower when using IFRS. For instance, a study by Cordazzo and Rossi (2020) based on a sample of non-financial listed Italian firms from 2000 to 2015 found that intangibles as a whole were not value relevant under IFRS, except for goodwill and research and development expenditures. However, when they divided the sample into intangible-intensive or non-intangible-intensive firms, the value relevance of research and development expenditures fell after the IFRS adoption. In a similar vein, a study by Paolone, Tiscini, and Martiniello (2020) based on a sample of Italian listed firms in the period 2010–2018 found that intangibles such as goodwill and research and development expenditures were positively related to stock prices. By contrast, Güleç (2021) claimed no change in the value relevance of research and development expenditures under IFRS.

In summary, there is a lack of consensus on whether using IFRS, instead of local GAAP, affects the value relevance of financial reports. Moreover, the different findings in the above-mentioned studies reflect the differences in the markets and time periods covered. The differences in findings could also be due to any changes in the accounting standards and principles over time.

2.2. IFRS and Forecasting Accuracy

Tan, Wang, and Welker (2011) and Choi, Peasnell, and Toniato (2013) found that financial analysts' earnings forecasts were more accurate when based on financial reports under IFRS, compared to financial reports under UK GAAP for mandatory UK IFRS adopters in the period of 2003–2007. Furthermore, Wang, Young, and Zhuang (2008) examined the effects of mandatory IFRS adoption in 2005 for a sample of 1438 firms in 17 European countries during the period of 2005–2006. They found significantly more accurate financial analysts' earnings forecasts for the post-IFRS adoption period than for the pre-IFRS adoption period. However, this finding was not so obvious when the authors divided the countries into legal origin groups. In particular, they found more accurate financial analysts' earnings forecasts for the French legal origin group but no significant change in accuracy for the German legal origin group. Byard, Li, and Yu (2010) found that financial analysts' earnings forecasts were more accurate and less dispersed when using accounting numbers based on IFRS for 1168 mandatory adopters

in 20 European countries for the time period of 2005–2006. However, this applied only to IFRS adopters domiciled in countries with both strong enforcement regimes and significantly different reporting practices under local GAAP, compared to IFRS. Further, Kwon, Na, and Park (2019) found that the use of IFRS led to more accurate earnings forecasts for a sample of firms listed on the Korean Stock Exchange. In a similar vein, Masoud (2017) investigated 66 companies listed on the Amman Stock Exchange and found that earnings forecasts were more accurate under IFRS. Hence, it appears that using IFRS results in better earnings forecast accuracy.

2.3. IFRS, Credit Ratings, and Bankruptcy Prediction

Bodle et al. (2016) used a sample of 46 listed Australian companies that went bankrupt in the period of 1991–2004 and found that the accounting numbers based on IFRS predicted bankruptcy better than those based on Australian GAAP due to the increased transparency and conservative accounting rules for intangibles under IFRS. This is consistent with Florou and Kosi (2015), who found lower bond yield spreads for companies using IFRS, and Florou, Kosi, and Pope (2017), who found that the accounting numbers of listed companies explained credit ratings better after the introduction of mandatory IFRS reporting in 2005. Furthermore, Charitou, Karamanou, and Lambertides (2015) found that IFRS were beneficial to the market, as companies with a higher default risk exhibited deteriorating characteristics after they started using IFRS. In addition, Wu and Zhang (2014) documented a significant increase in the sensitivity of credit ratings with the adoption of IFRS. On the other hand, Kraft and Landsman (2020) found no clear evidence of the credit relevance of accounting numbers after mandatorily switching to IFRS. Similarly, Bhat et al. (2014) found that adopting IFRS yields no change in the ability of earnings, the book value of equity, and the leverage to explain credit risk prices.

3. DATA

It is difficult to obtain enough financial reports for model estimation and evaluation from the same companies and same accounting years based on IFRS and local GAAP separately as most companies make financial statements for an accounting year under a single set of accounting standards. Consequently, we consider two similar Scandinavian countries by including annual financial statements of (i) Swedish companies made under IFRS, retrieved through the Orbis database, and (ii) Norwegian companies made under NGAAP, provided by the Norwegian

governmental agency, Brønnøysund Register Centre.[8] By using accounting data from the two countries, we obtain enough financial statements to compare the results of using local GAAP and IFRS, within the same accounting years. Thus, we eliminate any time period effects. However, as national cultures can impact accounting measurements and financial reporting practices, our results could potentially be affected by cross-country differences (Kanagaretnam, Lim, & Lobo, 2014). Guermazi and Halioui (2020) found that individualism and uncertainty avoidance are two important dimensions of national culture that influence behavior in terms of the implementation of accounting standards. Norway scores 69 and 50, whereas Sweden scores 71 and 29 for these dimensions, respectively. The scores for individualism are almost similar, meaning that both nations are characterized by an individualistic culture. The scores differ, however, in terms of uncertainty avoidance. The score of 50 for Norway does not indicate any preference for avoiding uncertainty, while the score of 29 for Sweden indicates a very low preference (Hofstede Insights, 2020). Overall, it appears that both countries are similar in terms of cultural dimensions that could impact the accounting practice. Hence, we assume that any effects due to cross-country differences in our data can be deemed negligible**.** Moreover, the local GAAP of Norway and Sweden are also very similar to each other in practice (Kristoffersen, 2020).

We include financial statements of privately held limited liability companies, spanning over the time period of 2006–2018. Furthermore, we include only financial statements of medium- or large-sized companies, which we define in accordance with the Orbis database as those with a turnover above EUR 1 million or total assets above EUR 2 million.[9] Following the common convention in the literature, we exclude all financial statements operating in the banking, real estate, and public utility sectors (Mansi, Maxwell, & Zhang, 2012). Further, we exclude financial statements that have missing values for any of the accounting indicators used for deriving our input variables.[10] In accordance with the central bank of Norway, we categorize financial statements as bankrupt if they are the last of their company to which they belong, and the company has filed for bankruptcy (Bernhardsen & Larsen, 2007). All other financial statements are categorized as non-bankrupt. Our final data sample consists of 1,892,294

8 Restrictions apply to the availability of these data. The web pages for the data providers are www.orbis.bvdinfo.com and www.brreg.no, respectively.

9 The Orbis database also uses the number of employees for defining size. We, however, do not rely on this, as it is not available for all our data.

10 This constitutes 0.5% of the financial statements in our remaining data set.

financial statements using NGAAP, of which 1.8% are categorized as bankrupt, and 347,159 financial statements using IFRS, of which 1.5% are categorized as bankrupt.

In keeping with the recent bankruptcy prediction literature (e.g., Tian, Yu, & Guo, 2015), we chose to use the real population of observations and to refrain from performing any matching in order to achieve a balanced dataset with an equal number of bankrupt and non-bankrupt financial statements. This is in line with Zmijewski (1984), who argued that the capability of a bankruptcy prediction model is distorted if it is estimated using a constructed dataset with a ratio of bankrupt to non-bankrupt observations that deviates from the real population.

3.1. The Input Variables

Since we are studying the effects of accounting standards, we use accounting-based input variables. Our initial set of variables is taken from the bankruptcy prediction model of Altman (1968) and the SEBRA model for bankruptcy prediction developed by the central bank of Norway. The former has been proven to perform well across different country settings (Altman, Iwanicz-Drozdowska, Laitinen, & Suvas, 2017) and is widely used by practitioners and academics (Appiah et al., 2015; Begley, Ming, & Watts, 1996; Bodle et al., 2016; Grice & Ingram, 2001; Mansi et al., 2012; Tian & Yu, 2017; Tian et al., 2015). The latter is developed for Norwegian companies and is used by the Financial Supervisory Authority of Norway (Bernhardsen & Larsen, 2007). Paraschiv, Schmid, and Wahlstrøm (2021) proved empirically that the variables of the SEBRA model yield good predictions when used with recent financial statements from privately held companies. Our initial set of variables is shown in Table 1 and measures liquidity, profitability, leverage, solvency, and company size. We do not consider the variable measuring activity which is present in the model of Altman (1968) as it has been found to be insignificant and industry sensitive (Altman, 1968, 1993). Furthermore, this is also consistent with Vo, Pham, Ho, and McAleer (2019) and Ntoung, Oliveira, Sousa, Pimentel, and Bastos (2020) who also predicted bankruptcy with the accounting-based variables of Altman (1968) but without the variable measuring activity.

Table 1. The initial set of input variables used in this paper. The first four are taken from Altman (1968) with the book value of equity in the variable BVEQ/TL, as suggested by Altman (1993). The remaining are taken from the SEBRA model developed by the central bank of Norway (Bernhardsen & Larsen, 2007).

Variable	Category	Description
WC/TA	Liquidity	Working capital to total assets
RE/TA	Leverage	Retained earnings to total assets
EBIT/TA	Profitability	Earnings before interest and taxes to total assets
BVEQ/TL	Solvency	Book value of equity to total liabilities
BVEQ/TA	Leverage	Book value of equity to total assets
dEQ	Solvency	Dummy: one if book value of equity is less than paid in capital
LIQ/REV	Liquidity	Cash and cash equivalents less current liabilities to operating revenue
logTA	Size	The natural logarithm om total assets in EUR
PA/TA	Liquidity	Trade payables to total assets

Altman (1968) used the market value of equity in the numerator of the variable, BVEQ/TL. Instead, we follow the revised model of Altman (1993), using the book value of equity. This is in accordance with the claim that book–debt ratios are better than market debt ratios, as debt issued against the latter can distort future investment decisions, which is due to the fact that market values incorporate present values of future growth opportunities (Moyer, 1977; Shyam-Sunder & Myers, 1999). Further, as the book value of equity is not directly available in the Orbis database, we calculate it by subtracting total liabilities from total assets. Moreover, as retained earnings are not commonly reported by privately held companies in the Orbis database, we use "Other shareholder funds" as a proxy. This item also includes profits for the fiscal year, treasury reserves, voluntary provisions, and other minority interests (Orbis, 2007). However, this is deemed acceptable, as all of these items reflect the company's savings (Fan & Kalemli-Ozcan, 2015).

Following the existing literature,[11] we restrict the values of the non-dummy input variables between the 5th and 95th percentiles across the financial statements based on IFRS and NGAAP, respectively, for each accounting year. If the denominator of a ratio variable is zero and its numerator is positive (negative) then the variable value is set to the maximum (minimum), i.e., the 95th (5th) percentile. If both the numerator and denominator are zero, the variable value is set to zero.

[11] E.g., Campbell, Hilscher, and Szilagyi (2008) and Gupta, Gregoriou, and Ebrahimi (2018).

To avoid multicollinearity, we exclude several input variables from our initial set in Table 1. The exclusions are based on the Pearson correlation coefficient between the pairs of input variables and the variance inflation factor for each input variable *i* calculated as:

$$VIF_i = \frac{1}{1 - R_{OLS}^2} \quad (1)$$

where R_{OLS}^2 is the coefficient of determination of an ordinary least squares (OLS) model with variable i as the regressand and the remaining variables as regressors. VIF_i can take any value above one, where the lower the VIF_i the lower the multicollinearity (Gareth, Witten, Hastie, & Tibshirani, 2017). We recalculate the VIF_i values each time a variable is excluded from our variable set.

We find that the input variables RE/TA, BVEQ/TL, BVEQ/TA and LIQ/REV are highly correlated with each other, especially for the financial statements based on IFRS, resulting in very high VIF_i values of above 100. To ensure that leverage is measured by the final variable set, we select only BVEQ/TA from these four variables. Next, we exclude logTA as it has a high VIF_i value even though it is not highly correlated with any other single variable. In the remaining variable set, we have two variables measuring liquidity. Among these, we exclude WC/TA as it has the highest VIF_i value and is highly correlated with BVEQ/TA while the other liquidity variable, PA/TA, is only weakly correlated with any other variable.

Tables 2 and 3 show the VIF_i values for each variable in the final variable set when using the financial statements based on IFRS and NGAAP, respectively, as well as the correlations between the pairs of variables. We observe no evidence of unacceptable multicollinearity for the final variable set.

Table 2. The variance inflation factor (VIF_i) values for each variable in the final set and the correlations between the pairs of variables when using the financial statements based on International Financial Reporting Standards (IFRS). The description of the variables is provided in Table 1.

Variable	VIF_i	EBIT/TA	BVEQ/TA	dEQ
EBIT/TA	1.66			
BVEQ/TA	1.77	0.23		
dEQ	1.07	−0.18	−0.25	
PA/TA	1.44	−0.05	−0.39	0.13

Table 3. The variance inflation factor (VIF_i) values for each variable in the final set and the correlations between any pairs of variables when using the financial statements based on Norwegian Generally Accepted Accounting Principles (NGAAP). The description of the variables is provided in Table 1.

Variable	VIF_i	EBIT/TA	BVEQ/TA	dEQ
EBIT/TA	1.27			
BVEQ/TA	1.22	0.32		
dEQ	1.37	−0.45	−0.57	
PA/TA	1.32	−0.20	−0.41	0.23

4. METHODOLOGY

4. Methodology

Earlier bankruptcy prediction studies used a linear discriminant analysis to derive their models.[12] However, there are several issues with using this method in economics and finance, including its assumption of a multivariate normal distribution of the input variables and equal variance–covariance matrices across the groups of classes (Deakin, 1976; Eisenbeis, 1977; Joy & Tollefson, 1975). Consequently, LR was introduced for bankruptcy prediction by Ohlson (1980). The benefits of using LR are that it requires less restrictive assumptions and gives more intuitive outputs.[13]

Let the vector $\hat{\boldsymbol{y}} = \{\hat{y}_n\}_{n=1\ldots N} \in [0,1]^N$ determine the predicted probabilities of bankruptcy given by:

$$\hat{\mathbf{y}} = \boldsymbol{\iota} \oslash \left(\boldsymbol{\iota} + \exp(-\mathbf{X}\boldsymbol{\beta} - \boldsymbol{\iota}\beta_0)\right) \tag{2}$$

[12] E.g., Altman (1968), Meyer and Pifer (1970), Deakin (1972), Wilcox (1973), Blum (1974), Libby (1975), Altman and Loris (1976), Ketz (1978), and Pettway and Sinkey (1980).

[13] When predicting bankruptcy using LR, where bankrupcy is labeled 1, the frequency of bankruptcies in the training data, i.e., the data used for estimating the coefficients, will always correspond to the average of the outputs from the trained LR model across all observations in the training data. Consequently, the output of the LR bankruptcy prediction model for any specific observation can be interpreted as the probability of banktuptcy.

where $\boldsymbol{X} = \{x_{(n,i)}\}_{n=1,\dots,N,i=1,\dots,I}$ is a matrix of values for the input variables i derived from the financial statements n, $\boldsymbol{\beta} = \{\beta_i\}_{i=1,\dots,I}$ and β_0 are the model coefficients, $\oslash$ denotes the Hadamard (element-wise) division, and $\boldsymbol{\iota}$ is an $N \times 1$ vector of ones.

The coefficients are estimated by maximizing the likelihood function given by:

$$\prod_{\boldsymbol{n=1}}^{\boldsymbol{N}} (\hat{\boldsymbol{y}}_{\boldsymbol{n}})^{\boldsymbol{y_n}} (\mathbf{1} - \hat{\boldsymbol{y}}_{\boldsymbol{n}})^{\mathbf{1}-\boldsymbol{y_n}} \tag{3}$$

where $\boldsymbol{y} = \{y_n\}_{n=1\dots N} \in \{0,1\}^N$ is the vector of actual classifications of bankrupt (1) or non-bankrupt (0) for the financial statements n. In practice, instead of maximizing the likelihood function, we minimize the negative of the log likelihood function given by:

$$\ell(\boldsymbol{\beta}, \beta_0) = \sum_{n=1}^{N} \left[\boldsymbol{y} \odot (\boldsymbol{X\beta} + \boldsymbol{\iota}\beta_0) - \log\left(\boldsymbol{\iota} + \exp(\boldsymbol{X\beta} + \boldsymbol{\iota}\beta_0)\right)\right] \tag{4}$$

where $\odot$ denotes the Hadamard (element-wise) product. The minimization is conducted by following an iterative optimization algorithm.[14]

We predict bankruptcy in a one-year horizon, which corresponds with the practice of most practitioners and academics (Hillegeist, Keating, Cram, & Lundstedt, 2004; Tian & Yu, 2017; Tian et al., 2015). Indeed, Appiah et al. (2015) found that one-year data were most often considered among all the bankruptcy prediction studies they reviewed and that such studies achieved remarkable results. Further, several studies on bankruptcy prediction have shown that the best prediction was made when the forecasting horizon was one year or shorter.[15] By using a one-year time horizon, we comply with the Basel III regulatory framework, which states that the probability of default for bank and corporate exposures is the prediction of a one-year-ahead probability of default (Bank of International Settlements, 2017).

We use an eight-fold cross-validation procedure with forward validation and a rolling window to divide the sample into eight subsamples, as illustrated in Table 4 (Kaastra & Boyd, 1996;

[14] For minimization, we use the L-BFGS-B algorithm (Byrd, LU, Nocedal, & zhu, 1995; Zhu, Byrd, Lu, & Nocedal, 1997). Further, we use zero as the initial value for all coefficients $\boldsymbol{\beta}$ and β_0 for the algorithm.

[15] E.g., Altman (1968), Blum (1974), Altman, Haldeman, and Narayanan (1977), Moyer (1977), Ohlson (1980), Aziz, Emanuel, and Lawson (1988), Altman, Marco, and Varetto (1994), Dimitras, Slowinski, Susmaga, and Zopounidis (1999), Tian et al. (2015), and Tian and Yu (2017).

Keles, Scelle, Paraschiv, & Fichtner, 2016).[16] For each of the eight subsamples, we evaluate the out-of-sample performance using test data consisting of all financial statements from one of the accounting years during the period of 2011–2018. We name the subsamples in accordance with the year used for measuring out-of-sample performance. Furthermore, we train the model, i.e., estimate the coefficients $\boldsymbol{\beta}$ and β_0, and evaluate the in-sample fit separately for each subsample using training data consisting of all financial statements from the five previous years. The procedure is carried out separately for all financial statements based on IFRS and local GAAP.

Table 4. For each of the eight subsamples, we separately train the model and evaluate the in-sample fit using training data consisting of all financial statements from five subsequent accounting years, which are given in green. We further evaluate the out-of-sample performance using test data consisting of all financial statements from the following accounting year, which are given in blue.

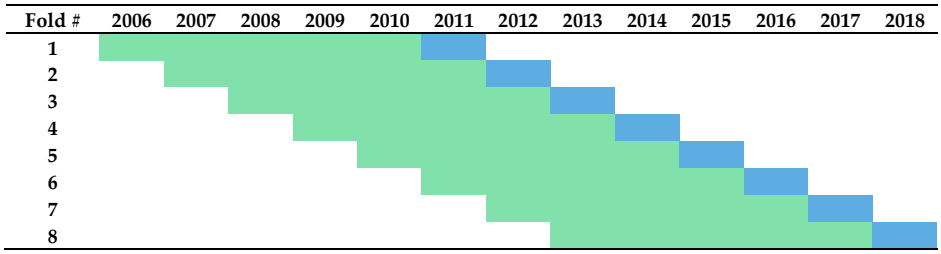

Table 2 shows the number of financial statements based on IFRS and local GAAP within the training and test data for each of the eight folds. It also shows the fractions of financial statements categorized as bankrupt. Following the existing literature,[17] we restrict the values of the input variables between the 5th and 95th percentiles across the financial statements used in the training and test data, respectively, for each of the folds. In addition, all ratio values with zero in the denominator are set to zero.

[16] Our results are robust to using an expanding window for enabling the utilization of all previous data when training models. Results are available upon request.

[17] E.g., Campbell et al. (2008) and Gupta et al. (2018).

Table 5. Number of financial statements within the training and test (out of sample) data for each subsample, based on International Financial Reporting Standards (IFRS) and Norwegian Generally Accepted Accounting Principles (NGAAP), respectively. The fractions of financial statements categorized as bankrupt are shown below each number.

Subsamples	2011	2012	2013	2014	2015	2016	2017	2018
IFRS								
Training data	35 772	69 046	104 801	141 986	180 936	200 151	215 406	231 768
Bankrupt	3.3%	2.7%	2.4%	2.0%	1.6%	1.4%	1.2%	1.1%
Test data	34 803	37 727	39 564	41 932	46 125	50 058	54 089	58 187
Bankrupt	1.9%	1.8%	1.4%	0.9%	1.0%	1.1%	1.1%	1.1%
GAAP								
Training data	620 395	634 431	650 756	672 262	702 234	738 792	778 695	818 318
Bankrupt	2.0%	2.0%	1.8%	1.8%	1.7%	1.7%	1.7%	1.7%
Test data	128 715	136 584	145 556	153 781	161 706	167 824	175 798	181 244
Bankrupt	1.7%	1.8%	1.8%	1.7%	1.6%	1.8%	1.6%	1.3%

We evaluate the model performance using the area under the receiver operating characteristic curve (AUC), which is a widely used metric for evaluating bankruptcy prediction models.[18] The receiver operating characteristic curve is a plot of the false positive rate against the true positive rate at different thresholds for defining the predicted class an observation belongs to (Fawcett, 2006; Hosmer, Lameshow, & Sturdivant, 2013). The AUC can in practice have any value between 0.5 and 1, where a higher value indicates a higher explanatory power.[19] As a rule of thumb, an AUC between 0.7 and 0.8 is considered acceptable, while a value above 0.8 is considered excellent (Hosmer et al., 2013). When comparing different prediction models, AUC has been found to be superior to other statistics, as it takes into account both error costs and class skewness within the data (Huang & Ling, 2005).

We also measure in-sample fit using the pseudo-R squared (R^2) of McFadden (1974), which is given as:

$$R^2 = 1 - \frac{\ell(\boldsymbol{\beta}, \beta_0)}{\ell(\beta_0)} \in [0,1] \tag{5}$$

where $\ell(\beta_0)$ is the log likelihood of the null model, which does not contain any independent variables, but only the intercept coefficient β_0.

[18] E.g., Duffie, Saita, and Wang (2007), Altman, Sabato, and Wilson (2010), Tian et al. (2015), Tian and Yu (2017), and Gupta et al. (2018).

[19] In theory, AUC can have a value below 0.5 which represents an unrealistic model.

To determine the significance of the estimated coefficients, we use Wald statistics to assess the z-score of any coefficient of any input variable.[20] This is given for input variable i by:

$$z_i = \frac{\beta_i}{s_{\beta_i}} \tag{6}$$

where the denominator is the standard deviation of the numerator, which is given as $s_{\beta_i} = \sqrt{C_{i,i}}$, where $\boldsymbol{C} = \{C_{j,k}\}_{j=1,\ldots,N,k=1,\ldots,N}$ is the variance covariance matrix, given as $(\boldsymbol{X}'\boldsymbol{D}\boldsymbol{X})^{-1}$, and $\boldsymbol{D} = \{d_{j,k}\}c_{j=1,\ldots,N,k=1,\ldots,N}$ is a diagonal matrix with $d_{l,l} = \hat{y}_l(1-\hat{y}_l)$.

5. Results and Discussions

Tables 6 and 7 show the estimated coefficient values and model evaluations across the eight subsamples for the accounting years of 2011–2018, when considering the financial statements based on IFRS and NGAAP, respectively. The values in parentheses are the z-scores. The in-sample fit is evaluated by R^2 and AUC, while the out-of-sample performance is evaluated using AUC.

Table 6. Results across the eight subsamples for the accounting years of 2011–2018, when considering the financial statements based on International Financial Reporting Standards (IFRS). We show the estimated coefficient values of the logistic regression (LR) model, with the z-scores in parentheses. The input variables are detailed in Table 1. We report the in-sample fit using R^2 and area under the receiver operating characteristic curve (AUC) and the out-of-sample performance using AUC.

Variable/Metric	2011	2012	2013	2014	2015	2016	2017	2018
constant	−2.75 (−89.98)	−2.89 (−117.53)	−3.05 (−144.18)	−3.18 (−161.81)	−3.51 (−179.37)	−3.63 (−183.18)	−3.72 (−184.4)	−3.81 (−186.99)
EBIT/TA	−2.56 (−11.51)	−2.75 (−14.46)	−2.67 (−15.87)	−2.58 (−15.83)	−2.73 (−15.92)	−2.52 (−14.71)	−2.35 (−13.77)	−2.17 (−12.96)
BVEQ/TA	−3.84 (−27.29)	−4.17 (−37.02)	−4.32 (−44.30)	−4.78 (−50.18)	−4.54 (−49.01)	−4.60 (−49.13)	−4.51 (−48.38)	−4.32 (−47.48)
dEQ	0.53 (8.58)	0.74 (14.94)	0.87 (20.62)	0.97 (25.22)	1.05 (27.39)	1.11 (29.00)	1.12 (27.95)	1.12 (26.96)
PA/TA	1.39 (13.40)	1.80 (20.70)	2.29 (30.32)	2.60 (36.87)	2.94 (41.77)	3.00 (41.79)	2.91 (39.01)	2.78 (36.25)
R^2	0.19	0.22	0.23	0.24	0.22	0.22	0.22	0.20
In-sample AUC	0.80	0.82	0.83	0.84	0.84	0.84	0.83	0.82
Out-of-sample AUC	0.84	0.84	0.85	0.83	0.83	0.81	0.80	0.82

[20] The reader is referred to page 330 in Ryan (2018) and page 40 in Hosmer et al. (2013) for details on Wald statistics.

Table 7. Results across the eight subsamples for the accounting years of 2011–2018, when considering the financial statements based on Norwegian Generally Accepted Accounting Principles (NGAAP). We show the estimated coefficient values of the logistic regression (LR) model, with the z-scores in parentheses. The input variables are detailed in Table 1. We report the in-sample fit using R^2 and area under the receiver operating characteristic curve (AUC) and the out-of-sample performance using AUC.

Variable/Metric	2011	2012	2013	2014	2015	2016	2017	2018
Constant	−4.89 (−522.56)	−4.93 (−528.47)	−4.98 (−522.25)	−4.95 (−518.98)	−4.91 (−531.88)	−4.93 (−543.10)	−4.88 (−552.90)	−4.84 (−559.44)
EBIT/TA	−1.21 (−40.20)	−1.16 (−38.68)	−1.11 (−36.64)	−1.07 (−34.21)	−1.03 (−34.08)	−0.88 (−30.33)	−0.86 (−31.68)	−0.80 (−30.80)
BVEQ/TA	−0.89 (−38.44)	−0.85 (−37.41)	−0.89 (−39.53)	−0.94 (−42.57)	−0.92 (−44.17)	−0.83 (−41.86)	−0.81 (−44.24)	−0.84 (−49.19)
dEQ	1.11 (102.57)	1.12 (103.42)	1.07 (96.73)	0.98 (87.60)	0.93 (85.33)	0.93 (86.65)	0.87 (82.60)	0.81 (77.60)
PA/TA	2.61 (93.90)	2.76 (98.63)	2.79 (97.55)	2.83 (99.07)	2.95 (107.14)	3.00 (109.81)	2.95 (110.33)	2.86 (108.58)
R^2	0.22	0.23	0.22	0.21	0.20	0.19	0.18	0.17
In-sample AUC	0.83	0.83	0.83	0.82	0.81	0.81	0.80	0.80
Out-of-sample AUC	0.83	0.82	0.81	0.78	0.79	0.80	0.80	0.82

We observe that the values of R^2, in-sample AUC, and out-of-sample AUC are mostly higher for the financial statements based on IFRS, compared to those based on NGAAP.[21] This could be attributed to the increased transparency under IFRS, which prevents managers from using creative accounting practices to manipulate accounting reports in order to hide their true situation. Our findings also seem consistent with the literature, claiming improvements in financial reporting quality through IFRS adoption. Moreover, the AUC is close to or above 0.8 in all cases, which indicates that the accounting-based input variables in our study can accurately predict bankruptcy. Further, we observe stable coefficient estimates across the years, with high z-scores, indicating that all are significant.

The coefficient estimates for EBIT/TA have negative signs in all cases. This is expected, as higher values of these variables translate to relatively higher earnings and savings and thus a lower probability of going bankrupt. Furthermore, the magnitudes of these coefficients are greater under IFRS than NGAAP. The reason for this may be that NGAAP allow for the amortization of goodwill, while IFRS demand an impairment test, which yields more transparency. Furthermore, IFRS require the classification of development expenditures as intangible assets, whereas NGAAP allow them to be recognized as expenses. This can lead to an understatement of net income under NGAAP, which indicates that IFRS could be better suited to predicting company bankruptcy (Franzen, Rodgers, & Simin, 2007).

The coefficient estimates for BVEQ/TA are negative under both IFRS and NGAAP. This is also in accordance with our expectations as it suggests that a higher rate of equity compared to

[21] In this regard it should be noted that models resulting in only slight improvement in AUC scores have been shown to be superior at predicting bankruptcies resulting in potentially huge profit gains for creditors who use such models for credit decisions (Agarwal & Taffler, 2008; Paraschiv et al., 2021).

debt lowers the probability of going bankrupt. However, the magnitudes of the coefficients are greater under IFRS than NGAAP. This may be due to IFRS being more conservative when it comes to accounting for intangibles. For instance, brands cannot be recognized as intangible assets under IFRS (IFRS Foundation, 2021) while under NGAAP, they can. Another reason may be that IFRS require the recognition of more liabilities, such as long- and short-term employee benefits, termination benefits, and pension obligations, all of which increase liabilities and salary expenses. This lowers the value of BVEQ as higher expenses decrease retained earnings.

The coefficient estimates for dEQ are positive in all cases, which is logical as it suggests an increase in the probability of going bankrupt if the book value of equity falls below the paid-in equity. The coefficient values are higher under NGAAP than IFRS. This may be due to the lower retained earnings under IFRS as discussed above, which results in companies being worse off when dEQ is equal to one under NGAAP rather than IFRS.

The magnitudes of the coefficients for PA/TA are relatively similar under both NGAAP and IFRS. In all cases the signs are positive, which is as expected since it means that more trade payables increase the probability of going bankrupt.

Limitations and Suggestions for Future Research

Our study has some limitations. First, while we argue that cross country differences can be deemed negligible in our study, our research design does not capture any differences in firm characteristics. Second, it is difficult to obtain enough financial reports for model estimation and evaluation from the same companies and same accounting years reported based on both IFRS and local GAAP, respectively, as most companies make financial statements for any accounting year under a single set of accounting standards. Moreover, very few privately held companies report under IFRS in Norway. Finally, the firms could be technically bankrupt long before they legally declare bankruptcy. Hence, we could probably be predicting the firm's probability of arriving in such situation. Due to the lack of data on this issue, it is not possible to obtain clarification on it.

While we analyze the role of IFRS through bankruptcy prediction only with Swedish and Norwegian data, we recommend future research to explore this issue in other markets with local GAAP of other countries. Furthermore, if possible, we recommend investigating the differences between IFRS and local GAAP by considering the same financial reports based on both IFRS and local GAAP separately.

6. CONCLUSIONS AND IMPLICATIONS

This paper examined the impact of using IFRS on the transparency of financial reporting through bankruptcy prediction models using accounting-based input variables. We started with a set of variables taken from Altman (1968) and the SEBRA model developed by the central bank of Norway. We then excluded variables such that our final variable set showed no evidence of unacceptable multicollinearity. By using logistic regression and a comprehensive sample of privately held Norwegian and Swedish companies, our results indicate that financial reports using IFRS may yield better bankruptcy prediction models compared to financial reports using NGAAP. While our results show that the use of IFRS can help in providing a better picture of a company's financial health, our research design does not capture all differences in firm characteristics. This is due to the difficulties in obtaining the same financial statements of any particular company, derived under both IFRS and local GAAP separately, as most companies, especially private ones, make financial statements for any given accounting year under a single set of accounting standards. Hence, we urge caution while interpreting our results.

Our findings have implications for several stakeholders, as well as for the development and application of accounting. The increased performance of bankruptcy prediction models under IFRS could mean that the strict accounting regulations under IFRS improve transparency, which prevents managers of firms facing insolvency from hiding their company's true situation by engaging in creative accounting practices or window dressing of the accounts. For example, IAS 38 constrains managers from capitalizing on certain intangible assets such as brands (IFRS Foundation, 2021), thereby limiting the opportunity for the overstatement of total assets. Overall, improved transparency under IFRS should aid in providing a clearer picture to investors and creditors who can then make a sound decision on investing or lending funds to companies. For standard setters, our results provide empirical evidence of the benefits of aligning accounting standards towards IFRS, and how abandoning strict accounting practices could impact bankruptcy prediction. While there are several benefits of using IFRS, it may, however, generate extra costs for companies' accounting departments.

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Chapter 4

The role of IFRS accounting fundamentals in predicting the market risk and return of the common stock – The case of companies listed on the Oslo Stock Exchange[22]

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ABSTRACT

This chapter explores the relationship between the IFRS based accounting variables and market price and risk variables. The main objective of this chapter is to determine whether International Financial Reporting Standard's (IFRS) accounting variables can add information efficiency to market participants on stock returns and systematic risk. Similar to the security betas, the accounting betas for individual securities are defined as the covariance between the earnings of securities and market to price ratios divided by the variance of market earnings to price ratios. Using the regular market model and Fama and MacBeth (1973) panel regressions the analysis determines a relationship between market and accounting relevant risk (betas). The paper provides insight into how the mandating of IFRS has influenced the systematic risk associated with common stocks listed on the Oslo Stock Exchange. The paper finds a statistically significant relationship between the accounting beta and the systematic risk of common stocks. The paper contributes to the efforts of researchers who have been trying to link the accounting variables to the market return variables and to the growing literature on the informational role of IFRS.

Key words: Information efficiency, IFRS, Accounting Betas, Systematic risk

[22] This chapter (with the same title) is published in book titled "*Modeller, Fjordantologien 2019"* and is available at https://doi.org/10.18261/9788215034393-2019-07. The version presented here contains some minor revisions.

1.0 INTRODUCTION

Over the past years, the adoption of International Financial Reporting Standards (IFRS) has gained significant attention around the world with more than 100 countries allowing or mandating the use of IFRS for financial reporting purposes (Daske, Hail, Leuz, & Verdi, 2008, 2013). The European Union takes a unique position in this regard as the use of IFRS was first mandated here in January 2005 for all the listed companies on European Stock exchanges. Accounting regime changes have made an impact on the informational environment of the country. Past research shows that such changes in the informational efficiency can impact the fundamental characteristics of the common stock, that is, its risk and return. Thus, the same is expected from mandatory IFRS adoption (Barth, Landsman, & Lang, 2008; George, Li, & Shivakumar, 2016).

Regulation EC 1602/2002 mandates that the IFRS cite that the primary reason for corporate switching to IFRS is the capital market benefits. By adopting IFRS, it contributes to "the effective and cost-effective functioning of the capital markets". It is conjectured that IFRS are principal-based standards deemed to be of high quality that improve transparency through increased disclosures, better cross-country comparability and more economically motivated reporting. Indeed, some studies find that transparent financial reporting and disclosures can lower information asymmetry in capital markets (Botosan & Plumlee, 2002; Diamond & Verrecchia, 1991; George et al., 2016; Lambert, Leuz, & Verrecchia, 2007). The effect is improved quality of corporate reporting and decreased cost of capital (Barry & Brown, 1985). Moreover, recent studies have found that earnings of IFRS firms are less noisy and exhibit low levels of earnings management. This implies that accounting betas (the measure of the sensitivity of securities' earnings to price ratios to that of the market's earnings to price ratios) of firms, using IFRS should be less cyclical. In other words, improved financial reporting along with lower cyclicality of earnings should lead to lower risk and return of a common stock, as firm's earnings affect stock returns and thus its systematic risk. This paper therefore asks the following research questions: How has the adoption of IFRS affected the risk and return of a common stock in Norway? Can IFRS based earnings cyclicality inform investors about the systematic risk of the common stock?

Previous research has used the cost of capital, bid-ask spreads and future cash flows analysts forecast accuracy to address the impact of IFRS on the relevant risk of the common stock (Daske et al., 2013; George et al., 2016). In contrast this paper uses the already established link

between accounting risk measures and the market beta as defined in Mensah (1992). Market betas and stock prices are influenced by an investor's expectations of the firm and accounting data forms a part of these expectations. Thus, using the established link between accounting betas and market risk the paper establishes a model to test the market beta against the accounting beta and other variables composed using accounting information as defined in (Ball & Brown, 1968, 1969; Mensah, 1992). Mensah (1992) points out that expressing the exogenous variables, in this case the market beta in terms of accounting variables, is likely to be useful as accounting reports provide an overview of the financial status of a particular entity. Market betas were estimated using market model regressions. Fama and MacBeth (1973) procedure was used to test those betas against relevant variables, that is, degree of financial and operating leverage. Accounting betas as defined in Ball and Brown (1969) were computed in a similar manner.

From a stationary and well-established panel of 28 companies that had information available on the Oslo stock exchange, the cross-sectional analysis shows that the adoption of IFRS seems to lower the systematic corporate risk. Moreover, corporate accounting betas are found to be significant predictors of systematic risk. This finding is similar to the study conducted by Brimble and Hodgson (2007) that finds accounting betas are associated with the systematic risk of common stock.

The cross-sectional analysis yielded the following results: absent confounding events, the adoption of IFRS lowers the systematic risk of the common stock. Accounting betas are significant predictors of the systematic risk. However, they have a very low predictive power perhaps due to the lack of huge differences between the Norwegian Generally Accepted Accounting Principles (NGAAP) and the IFRS. Moreover, accounting betas are measured with a larger amount of error than market betas as they are estimated using yearly data. The degree of financial leverage is found to be a significant predictor of market risk, but with very low predictive power. The paper fails to find support for the degree of operating leverage. Analysis was conducted on a sample of 28 companies listed on the Oslo Stock Exchange that had complete information available both during the pre and post IFRS periods.

The paper contributes to the literature in the following ways: First, this study focuses on the effect of adopting IFRS on the systematic risk of the common stocks, while existing studies focus on the effects accounting information on systematic risk in diverse economic conditions and certain markets or industries (Agusman, Monroe, Gasbarro, & Zumwalt, 2008; Aruna &

Warokka, 2013; Brimble & Hodgson, 2007). Second, this study uses accounting based risk measures are used to assess the impact of IFRS adoption on market risk and informational efficiency, while existing studies have mainly used bid ask spreads or cost of equity to assess the impact of IFRS on the informational efficiency (Barth et al., 2008; Daske et al., 2013; George et al., 2016; Li, 2010). Third, to the best of my knowledge this is the one of the few studies to assess the impact of accounting variables and IFRS adoption on systematic risk in Norwegian context. The choice of sample thus differs from the other studies that have used data from emerging markets or industries (banks) (Agusman et al., 2008; Aruna & Warokka, 2013). Finally, this paper contributes to the efforts of researchers who have been trying to link the accounting variables to the systematic risk of common stock.

The rest of the paper is organized as follows. Section 2 presents the theoretical background regarding the link between accounting based and market-based measures of risk. Section 3 presents the data and methodology of the study. Section 4 presents the results; section 5 discusses the results and presents some limitations while section 6 concludes.

2.0 THEORETICAL PERSPECTIVES, BACKGROUND AND MOTIVATION

2.1 ACCOUNTING AND MARKET MEASURES OF RISK[23]

Linking the accounting and market measures of risk dates back to the seminal works of Ball and Brown (1968) and Ball and Brown (1969). The former paper found that the income number captured one-half or more information about an individual firm that is available during a given year. The latter paper adresses the implications of portfolio theory for accounting. It found that the accounting incomes are moderately good predictors of the estimated systematic risks of the firms. The co-movements between accounting income numbers explain about 35-40 percent of cross-sectional variability in degrees of association with the systematic risk when taken in first differences. However, their results are only tentative as risk is a expectational concept and they assume that income variables are constant through time.

Building upon their work Beaver, Kettler, and Scholes (1970) examine the contemporaneous association between the accounting determined and market determined measures of risk. More specifically, they identify dividend payout, growth, leverage, liquidity, asset size, variability of

[23] The purpose of this section is to provide an overview of theoretical background used in this paper and some highlights on the theoretical development in the field of capital market-based accounting research. Some later studies - such as Brimble and Hodgson (2007) - have applied some of the mentioned theoretical insights in their paper. These studies are not mentioned in this section as they mainly show the application of these theories within their chosen contexts rather than their development.

earnings and accounting beta defined as covariability of earnings to price ratios with that of the market's earnings to price ratios as measures that reflect both the accounting risk and individualistic risk components. They find evidence supporting the view that accounting measures of risk are compounded in the market based risk and conclude that investors do use accounting risk measures. The strongest association was for the measure of earnings variablity, the dividend payout and the accounting beta. However, the accounting beta was not the most important predictor of the market beta as it was estimated with a large amount of error due to a low number of estimators.

Gonedes (1973) reported findings that contradict those of Beaver et al. (1970), finding a low association but a "statistically significant" relationship between accounting and market based risk variables. The reason is that Gonedes (1973) scaled income numbers by another accounting income numbers as opposed to Beaver et al. (1970), who scaled income numbers with market prices. However, it is unknown whether the significant association is due to differences in scaling the income numbers or other factors such as a smaller and substantially different sample from previous studies (Beaver & Manegold, 1975). Further in the same vein, Beaver and Manegold (1975) composed accounting betas under a variety of specifications and used the bayesian adjustment procedure to reduce measurement errors. They found a statistically significant relationship between market and accounting betas. Later, Bowman (1979) used these findings and those of Hamada (1972) and Hamada (1969) and under the assumptions of the Capital Asset Pricing Model and unlimited lending and borrowing at risk free rate, showed that there is a theoretical relationship between market risk and accounting variables. More specifically, Bowman (1979) stated that systematic risk is related to a firm's leverage, growth, size and accounting beta and not to earnings variability, dividend policy as shown in Beaver et al. (1970).

Hill and Stone (1980) developed an accounting analogue to Hamada (1972) and Rubenstein (1973) formula that decomposed systematic risk into financial and operating risk of the common stock. They specified an accounting measure of intinsic systematic risk and expanded the concept of the relationship between the accoutning risk and systematic risk beyond the correlations, as was done in the previous studies. They found that their risk composed measure is superior to the covariance based measures for this sample. Expanding on this note, Mandelker and Rhee (1984) studied the joint impact of operating and financial leverage on the common stock. They found that both the components explained a large variation in the market beta. Mensah (1992) extended their model and added the intrinsic business risk as another

factor related to the market beta. He found that the real determinants of the market beta can be explained by the accounting flow measures. This study will thus use this approach to assess the impact of IFRS accounting fundamentals on the systematic risk and return of the common stock. The model is further explained in the methodology section.

2.2 IFRS RELATED RESEARCH AND BACKGROUND

IFRS was mandated in 2005 for all the companies listed on European stock exchanges with the main intention to improve transparency by providing a "single set of high-quality accounting standards". One of the successes of IFRS was its global adoption with at least 100 countries adopting IFRS or linking their local accounting standards closely to the IFRS. The IFRS are principal based standards deemed to be of high quality with cited benefits such as improvements in reporting quality, increased transparency and improved information flow, reduced information asymmetry and positive stock market effects (George & Shivakumar, 2016).

Improved disclosure quality and transparency as conjectured by the proponents of the IFRS should reduce information asymmetry and estimation risk. Barry and Brown (1985) show that risk averse investors prefer to invest in those securities that have more information included. Moreover, they point out that the amount of information provided by a firm in its financial statements influences its risk, return and cost of capital. This view is common among regulators and standard setters. Proponents of the IFRS argue that principal based standards do not provide guidance on dealing with specific circumstances, while rule based standards can make it easier for firms to manipulate the accounting data (Hofheinz, 2002). For example, the bankruptcy of Enron has shown how advantage can be taken of rule-based accounting standards. Thus, audit firms can detect fraud more easily (Ijiri, 2005).

In terms of stock market benefits, both the voluntary and mandatory IFRS adoption have increased market liquidity and decreased the cost of equity capital mainly in the countries with strict enforcement regimes (Daske et al., 2008). In a similar vein, Li (2010) investigates whether mandatory adoption affects equity cost of capital and observes a significant decrease of 47 basis points in the cost of equity capital for mandatory adopters. Empirical analysis of stock market benefits generally reveal that both voluntary and mandatory IFRS adoption have increased market liquidity and decreased the cost of equity capital (George & Shivakumar, 2016).

Studies have shown that information provided under IFRS standards provides higher information quality than the local accounting standards. For instance Barth et al. (2008) and George and Shivakumar (2016) show that firms that adopted the IFRS revealed higher accounting quality post adoption in addition to less earnings management and timely loss recognition. Moreover, several studies have shown that disclosures under IFRS provide higher information quality to outside investors than domestic accounting standards. The higher accounting quality of the adopting firms and increase in accounting information should thus reduce the information asymmetry and lead to a lower cost of capital for a firm, especially when investors form their portfolios based on the existing information on risk and return of the stock (Barry & Brown, 1985; Coles & Loewenstein, 1988). Given the greater disclosures required under the IFRS framework, estimation risk and information asymmetry decreases thereby reducing the price of holding the common stock. This should thus result in reduction of the systematic risk of the common stock.

2.3 IFRS AND NORWEGIAN GAAP (NGAAP)

IFRS are based on a balance sheet-oriented conceptual framework, which starts with defining assets, debt and equity. The IFRS represented a substantial shift in financial reporting from domestic to international standards. Rules and requirements differ between the IFRS and domestic accounting standards within a given country with most notable being the use of fair value measurement (Barth, Landsman, Young, & Zhuang, 2014). NGAAP, on the other hand are based on an earnings-oriented conceptual framework where calculation of annual performance is the starting point. The major difference between these two standards is thus the preferred principal of measurement, which is fair value for the IFRS and the cost model for NGAAP. However, neither of these standards are faithful to their original measurement principal. For example, whenever fair value is not available the IFRS permit the use of the cost model (Gjerde, Knivsflå, & Sættem, 2008).

Some of the other differences that influence the calculation of earnings between the two standards are: NGAAP allow to expense the development expenditures leading to future economic benefits while under the IFRS they should be recognized as an intangible asset. Under the IFRS, most of the financial instruments are measured at fair value, whereas in NGAAP financial assets are measured at cost unless they are short-term instruments traded in a liquid market. Other differences between NGAAP and the IFRS arise in relation to pensions, deferred taxes and share based payments (Gjerde et al., 2008).

According to auditing firm Ernst and Young, of the 110 companies listed on the Oslo Stock Exchange in 2005, 28% reported a reduction in the 2004 net income after restating it in IFRS terms, while the remaining reported an increase in net income. The average increase was 17%. Non-amortization of goodwill and capitalization of the development expenditures were the largest influencers of the net income, thereby indicating that intangible assets are the cause for large differences in reported income between the IFRS and NGAAP. The IFRS and NGAAP based earnings are different from each other and will therefore affect the systematic risk of the common stock.

3.0 DATA AND METHODOLOGY OF THE STUDY

3.1 DATA AND SAMPLE SELECTION

The data used for this study is the firms listed on Oslo Stock Exchange (OSE) available on Datastream over the period 1997 to 2017. Altogether 1077 firms were available. In order to be included in the sample the firm should have its primary listing on OSE and not belong to a financial sector such as banking or insurance. In addition, firms must also have the data available for at least 5 years prior to the $Year_t$. Moreover, to avoid the bias caused to sample attrition as result of IFRS adoption (George et al., 2016), only firms with complete set of information for the entire time period were selected. Applying these filters gave a final dataset that comprised of 28 firms and 518 firm year observations.

Market beta was calculated using monthly data and rolling regressions with a 60 -month rolling window. Accounting betas were computed similarly. However, the rolling window in this case was only 36 months owing to the limited availability of the accounting data which is only provided on yearly basis[24]. The estimated betas were used as input in the main regression model. The remaining accounting variables are available on yearly basis.

The table 1 in Appendix A presents the yearly averages of market and accounting betas (in natural logarithmic form) along with other control variables used in the panel data regressions. From the time of introduction of IFRS in 2005 there seems to marginal reduction in the averages of the Market Beta and Accounting Beta. It is, however, unclear whether this reduction can solely be attributed the IFRS adoption.

[24] We only use official accounting data. The data is reported once a year and therefore available from Datastream on yearly basis.

3.2 STATIONARITY AND AUTOCORRELATION

Since this paper deals with the data that change over time (time series data), it was deemed necessary to carry out the unit root tests for stationarity and tests for autocorrelation prior to proceeding with the main analysis. The data for each of the variables were tested for stationarity and unit roots[25]. Fisher type augmented Dickey Fuller test for unit roots was chosen as it can handle unbalanced panels. The following table shows the results:

Table 1: Fisher type - Augmented Dickey Fuller Test for Unit Roots*

Variables	Inverse Chi Squared	P - Values
lnMbeta	315.7511	0.0000
lnAbeta	272.1639	0.0000
lnDOL	432.9473	0.0000
lnDFL	545.4294	0.0000

**lnMbeta = Logarithm of the Market Beta (Systematic risk of the common stock)*
lnAbeta = Logarithm of the Accounting Beta
lnDOL = Logarithm of Degree of Operating Leverage
lnDFL = Logarithm of Degree of Financial Leverage

The results in table 1 indicate the absence of unit roots thereby revealing that all the variables are stationary. As the number of groups is relatively small (N=28), the inverse chi squared (P) test value was used in assessing the stationarity of the series (Choi, 2001).

Autocorrelation was tested by regressing the residuals against the lagged residuals. The series were found to be auto correlated on the levels. The residuals were however uncorrelated in their first difference[26]. Therefore, the model will be tested in the first differences.

3.3 METHODOLOGY

Previous studies have used the panel data time series regressions to assess the impact of the IFRS on the dependent variable of interest (Daske et al., 2008, 2013; Li, 2010), while market betas (systematic risk) were found by regressing stock returns against the returns of the market. Researchers such as Beaver et al. (1970) have shown a statistically significant relationship

[25] Note that there are no a priori reasons to believe that the variables could be non – stationary. However, as the paper deals with time series data it was deemed necessary to carry out the unit roots tests for stationarity.
[26] Auto-correlated residuals indicate that the residuals are not independently and identically distributed (i.i.d). In order to correctly estimate the model, it is necessary to have i.i.d residuals (Stock & Watson, 2015). Hence the model is estimated in the first differences.

between the systematic risk of a common stock and the accounting beta. Moreover, there was an association among the systematic risk and earnings variability and growth. Mensah (1992) argues that expressing exogenous variables in accounting terms is likely to be useful as accounting reports provide an overview of the financial and operational status of a particular entity. Thus, building upon the work of Beaver et al. (1970) and Mandelker and Rhee (1984) the model that relates a firm's financing decisions and accounting beta to the firm's systematic risk is as follow[27]:

$$lnMbeta = \propto_0 + \propto_1 \ln(Abeta_i) + \propto_2 \ln(DFL_i) + \propto_3 \ln(DOL_i) + \varepsilon_i \qquad (1)$$

where:

Mbeta = Systematic risk of the common stock

Abeta = Accounting beta of a firm computed as $\frac{Cov\,(E_t/P_t, M_t)}{Var\,(M_t)}$

$M_t = (\sum_{t=1}^{N} E_t/P_t)/N$ represents a market wide measure of earnings, derived in a similar manner as the stock exchange indices.

N = Number of Norwegian companies found in the Oslo stock exchange index for which the earnings and price data were available for the time period considered.

DFL = Degree of Financial Leverage computed as $(\Delta X_{Lit}/X_{Lit-1})/(\Delta X_{Uit}/X_{Uit-1})$, where X_{Lit} represents earnings per share of a financially leveraged firm *i* at time *t.*

DOL = Degree of Operating Leverage $(\Delta X_{Uit}/X_{Uit-1})/(\Delta S_{it}/S_{it-1})$, where X_{Uit} represents earnings per share of a firm without financial leverage at time *t* and S represents sales of a firm.

As indicated in previous research, DOL captures the effects of a firm's choice of production system and other operational decisions, while DFL reflects a firm's financial structure. DOL reflects the operating risk, the pure systematic influence of economy wide events and uncertainty associated with a firm's operating efficiency. When the firm is completely unlevered then DOL and DFL equal 1. This intrinsic business risk therefore represents the systematic risk of a common stock (Mandelker & Rhee, 1984). Both of these variables will

[27] Following the convention in literature and to improve the normality (normal distribution) and linearity in our model we apply natural log transformation to our variables.

thus be used as control variables. Accounting beta reflects the cyclicality of the firm's accounting flows relative to those of other firms in the economy. Thus, actions taken by the management related to expanding the product line will affect the systematic risk of the common stock to the extent that they affect the cyclicality of the net accounting flows (Mensah, 1992).

The paper is open to the finding that IFRS might not have had any impact on the systematic risk of the common stock, thus two-sided tests are employed. Since the study involves assessing the impact of IFRS accounting variables on the systematic risk of the common stock, the model in equation 1 was extended to include a binary variable *IFRS*, which takes the value of 1 when the firm allowed IFRS that is after the year 2005. Since the sample consists of firms that were mandatory adopters and includes a complete set of information available for both the pre and post adoption period, inclusion of interaction terms as in (Daske et al., 2013; Li, 2010) are not necessary. The *IFRS* variable captures the average effect on the systematic risk of the common stock. The final regression model is as follows:

$$\Delta lnMbeta = \propto_0 + \propto_1 IFRS + \propto_2 \Delta\ln(Abeta_i) + \propto_3 \Delta\ln(DFL_i) + \propto_4 \Delta\ln(DOL_i) + \varepsilon_i \quad (2)$$

This research design allows for investigating the change in market risk in the pre and post IFRS period. In order to control for firm specific determinants of the dependent variable, the regressions include fixed firm effects along with the clustered robust standard errors. Financial structure (captured through DFL) is shown to be industry dependent (MacKay & Philips, 2005). In order to avoid multicollinearity, we therefore do not include any industry fixed effects in our model.

The two stage regression procedure as in Fama and MacBeth (1973) was applied to estimate the above model. First, the market beta of the stock was estimated using monthly price data and the rolling market model regressions of the form as in Fama and French (1992):

$$R_{it} = \alpha_i + b_i R_{Mt} + e_{it} \quad (3)$$

The beta coefficients were then used as the dependent variable in the model to be tested. Accounting betas were estimated in a similar manner. The variables here were required to have data for three years prior to the $Year_t$. Rolling regressions of the following form were carried out:

$$Z_{it} = b_0 + b_1 Z_{mt} + a_t \quad (4)$$

where b_1 is the accounting beta (*Abeta*) and Z represents the earnings.

4.0 RESULTS

4.1 REGRESSION RESULTS

The analysis begins by examining the average differences in the systemic risk of a common stock before and after adoption of the IFRS. Cross sectional time series panel regressions with entity and time fixed effects are used which benchmark IAS firms against their own local GAAP history before adoption of the IFRS. Table 2 below presents the regression coefficients along with firm and adjusted standard errors, t-statistics and two tailed p-values for the full sample period (1997-2017):

Table 2: Regression analysis of systematic risk of common stock for mandatory IFRS adopters*

Model Estimated: $\Delta \boldsymbol{lnMbeta} = \propto_0 + \propto_1 \boldsymbol{IFRS} + \propto_2 \Delta \ln(\boldsymbol{Abeta_i}) + \propto_3 \Delta \ln(\boldsymbol{DFL_i}) + \propto_4 \Delta \ln(\boldsymbol{DOL_i}) + \boldsymbol{\varepsilon_i}$

Parameters	Coefficients	Standard Errors	T statistic
IFRS	-0.006	0.002	-3.11
LnAbeta	-0.004	0.004	-2.14
lnDOL	-0.002	0.002	-0.81
lnDFL	0.002	0.0001	25.63
Intercept	0.004	0.001	3.48
R^2	0.042		
Number of firms	28		
Number of observations	518		
F(4, 27)	180.40		
Prob > F	0.00001		

**IFRS: difference in difference estimator that takes value of 1, when a given firm adopts IFRS and 0 otherwise.*
lnMbeta = Logarithm of the Market Beta (systematic risk of the common stock)
lnAbeta = Logarithm of the Accounting Beta
lnDOL = Logarithm of Degree of Operating Leverage
lnDFL = Logarithm of Degree of Financial Leverage

Using differences in market betas as dependent variables, the coefficient on the IFRS is significant and negative, suggesting that mandatory IFRS adoption resulted in the very low reduction of systematic risk of the common stock. The coefficient for change in accounting beta is negative and statistically different from zero, however not as low as the IFRS thereby

suggesting that IFRS based earnings have little impact on reducing the systematic risk of the common stock. The coefficient on changes in the degree of financial leverage is significant and has the expected sign, however very low in power. If one were to forecast market betas, they could be improved if one predicted the financial structure of the firm. The coefficient on degree of change in operating leverage is found to be statistically indifferent from zero [28].

5. DISCUSSION AND LIMITATIONS

5.1 DISCUSSION

The purpose of this paper is to study the impact of mandating the IFRS on the risk and return of common stocks listed on the Norwegian Stock Exchange. The effect of the IFRS being mandatory is measured by the IFRS difference estimator that equals 1 after the IFRS were mandated and accounting betas. Based on the literature review, the degree of operating and financial leverage are used as control variables. A panel data approach is employed where the period is 1997 to 2017 and 2005 was the year of the IFRS being mandatory and the model is tested in first differences.

The paper's main finding is a lower systematic risk of a common stock from adoption of the IFRS. This finding is in line with Daske et al. (2008) who finds that the cost of capital decreases after adoption of the IFRS in countries with strong regulatory enforcement. The accounting betas seem to have a low negative impact on systematic risk, which is consistent with previous research in this area (Beaver et al., 1970; Beaver & Manegold, 1975). One of the possible reasons for this could be that the difference in value relevance between the IFRS and NGAAP is only incremental, caused by the adjustments of net operating income, operating revenue and costs. The IFRS require fair values of assets to be reported which are reported at cost when acquired and are subsequently revalued, while offering reporting at cost as an alternative, if fair values cannot be measured reliably. NGAAP, on the other hand requires recognizing assets at cost. According to the revaluation model, the carrying amount between revaluations is reduced by depreciation and possible impairments. Due to difficulties in measuring fair value of the assets based on fair value reliably, most firms using the IFRS will report according to a cost model. Thus the reported earnings may not differ much (Gjerde et al., 2008). This is also in line with the fact that for the adoption of the IFRS to noticeably affect stock markets,

[28] As the model is estimated in first differences, the changes in the variables are predicted and the relationships are interpreted in terms of changes per year. For instance, changes in accounting betas appear to predict changes in market betas. Similar mode of interpretation follows for the remaining variables in first differences (changes per year).

reporting practices must vary significantly from the previously used local GAAP (George & Shivakumar, 2016).

A positive relationship is found between the systematic risk and degree of financial leverage. This result is also consistent with Hill and Stone (1980) and Huffman (1989) who find a positive relationship between systematic risk and degree of financial leverage. Hence, the more levered the firm is, the higher its systematic and financial risk. This is also consistent with the corporate finance literature that argues that financial leverage has an effect on the systematic risk (Berk & DeMarzo, 2014; Lumby & Jones, 2019). Moreover, studies also find that IFRS adopters are more likely to issue less risky public bonds (Florou & Kosi, 2015; George & Shivakumar, 2016; Naranjo, Saavedra, & Verdi, 2017) which could lead to a reduction in systematic risk and increased transparency in IFRS based financial reporting.

The degree of operating leverage is negatively related to systematic risk of a common stock, in contrast to Taussig and Akron (2017) who find that higher operating leverage is associated with higher stock returns. One possible explanation for the degree of operating leverage failing to explain the systematic risk is that it is dependent on the sector the firms belong to and its capital structure. Another explanation may be that it is caused by differences in accounting methods used to calculate earnings (Huffman, 1989). Overall, it appears that evidence on this link is mixed.

In summary, the results reveal that in the absence of confounding events, the changes in the systematic risk of the common stock is lower during the IFRS period. Accounting betas have less explanatory power when it comes to predicting systematic risk; however, the coefficient is statistically significant. The degree of financial leverage is a significant predictor of systematic risk, however this paper fails to find support for the degree of operating leverage.

5.2 LIMITATIONS

The study suffers from some caveats. First, it is empirically difficult to filter out the effects of confounding events around adoption of the IFRS. Thus, the results of this study cannot be solely attributed to IFRS adoption. Since mandatory IFRS adoption was a major corporate event and constant efforts were made to improve the enforcement system, the reduction in systematic risk could be the combined result of IFRS adoption and other concurrent (confounding) events. As the cost of adoption of the IFRS is high, there are other benefits as well as other indirect costs associated with the adoption that could have had an impact on the accounting numbers of firms. Another limitation is the fact that accounting betas are measured

with error. While market betas are estimated using the monthly data, accounting betas and other accounting variables use yearly data. Thus, the fewer number of observations for the accounting variables reduces the precision with which they are measured. Since only firms present in both pre and post the IFRS period are selected, the results may suffer from data snooping bias such as survivorship bias. Moreover, the small sample size of 28 firms makes it difficult to generalize the results. The results are also dependent on how different the local GAAP and the IFRS are from each other.

Finally, the results of this study should be interpreted with caution as there could have been other (confounding) events that led to lower systematic risk of the common stock and are due to the possible influence of omitted variables. In order to identify only the effect of the standards, one has to identify such events and separate their effects from the effects of financial reporting. While the paper finds support for the IFRS based accounting variables towards predicting the systematic risk of the common stock, the model is not designed to analyze the relevant contribution of the IFRS alone. This is left to the future research in this area.

6.0 CONCLUSION

This paper examines the impact of IFRS adoption on the systematic risk of the common stock through the use of accounting betas and other measures composed using IFRS figures from the balance sheet. Using the regular market model and panel data regressions along with Fama and MacBeth (1973) procedure, a model is tested with market beta as the dependent variable. The study finds that mandatory IFRS adoption has lowered the systematic risk of a common stock for the sample of 28 Norwegian listed companies. Accounting betas and degree of financial leverage were found to be significant towards explaining the market risk, however with very low predictive power. The degree of operating leverage was found to be an insignificant predictor of market risk.

Finally, the results should be interpreted with caution as there could be other confounding events that could have impacted the risk and return of a common stock, and the possible influence of omitted variables and measurement errors of the results. Future research should thus focus on the research designs that could enable analysis of the contribution of the IFRS alone on the risk and return of common stock.

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Appendix A

Table 1: Average of the variables (in time) used in study *

Year	lnMbeta	lnAbeta	lnDOL	lnDFL
1997	1.190944	4.331048	6.635084	7.08459
1998	1.405249	4.329371	6.54893	7.085207
1999	1.420987	4.310142	6.637141	7.085403
2000	1.420384	4.250058	6.63256	7.123223
2001	1.423037	4.333229	6.636332	7.0872
2002	1.423161	4.375356	6.63921	7.09066
2003	1.432063	4.375541	6.69056	7.086784
2004	1.443099	4.380969	6.633243	7.085104
2005	1.439839	4.329312	6.642185	7.085502
2006	1.439474	4.329633	6.621601	7.085175
2007	1.435562	4.177286	6.631587	7.181782
2008	1.424587	4.282343	6.612872	7.103854
2009	1.421705	4.346891	6.637333	6.822781
2010	1.421535	4.359349	6.65237	7.084978
2011	1.421331	4.345037	6.659818	7.083141
2012	1.422029	4.337147	6.64598	7.08449
2013	1.421581	4.323766	6.627895	7.085211
2014	1.420607	4.329548	6.64256	7.08729
2015	1.420108	4.3298	6.629834	7.085662
2016	1.42054	4.32918	6.608273	7.085488
2017	1.420123	4.329359	6.723567	7.08511

**lnMbeta = Logarithm of the Market Beta (systematic risk of the common stock)*
lnAbeta = Logarithm of the Accounting Beta
lnDOL = Logarithm of Degree of Operating Leverage
lnDFL = Logarithm of Degree of Financial Leverage

Chapter 5

The Role of IFRS adoption in Predicting Abnormal Volatility During Mergers and Acquisitions: Evidence from Sweden and Norway

(To be Submitted)

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ABSTRACT

This chapter explores the relationship between the adoption of International Financial Reporting Standards (IFRS) and the abnormal stochastic volatility generated during mergers and acquisitions (M&A). The main objective is to determine whether IFRS adoption, when coupled with several accounting predictors, can contribute to the explanation of abnormal volatility during an M&A. Using a stochastic volatility (SV) model and Efficient Method of Moments (EMM) approach, we estimate the abnormal volatility of a sample of 56 Norwegian and Swedish companies involved in M&A together with respective market indices. We then follow the event study methodology to compute the abnormal volatility that is accumulated over a specific event window. The results from the cross-sectional analysis indicate that IFRS adoption is a significant predictor of abnormal volatility during the event window. This suggests that financial reporting under IFRS could play a role in determining the risks associated with an M&A. Our study thus contributes to the literature regarding the role of accounting information for transparency in M&A.

Keywords: IFRS adoption, Mergers and Acquisitions, Stochastic volatility, Abnormal Stochastic Volatility

Chapter 6

Conceptual formation and explanation in IFRS-Based Financial Accounting Research[33]

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Abstract

This article provides a preliminary review of the conceptual formation and explanation within International Financial Reporting Standards (IFRS)-based financial accounting research. The mandatory adoption of IFRS by the European Union (EU) on January 1, 2005 resulted in an increase in the number of scientific articles explaining the effect of mandating IFRS on capital markets within the EU. Independently, these studies offer interesting insights; however, there have been few attempts to offer a critical analysis of the current state of the field in terms of conceptual formation and the role of theories in explanation. This paper provides a richer understanding of the scientific basis of the empirical research within this emerging field. We identify and critically assess a conveniently selected sample of eight scholarly articles. Our findings suggest that the concepts in these articles appear to be borrowed from the mainstream accounting and finance literature and used in the form of variables. These concepts primarily play a deductive role. The nature of explanation appears to be mechanistic. We offer a discussion of our review's findings and suggest some implications for future research.

Keywords: *IFRS; conceptual formation; scientific explanation; accounting research*

[33] This chapter is published in *Cogent business and management* with the same title and is available at https://doi.org./10.1080/23311975.2021.1935185. The version presented here contains some minor revisions. It was co-authored with Ghulam Mustafa, Associate Professor in the Department of International Business at NTNU in Ålesund.

1.0 INTRODUCTION

The purpose of this article is to review the conceptual formation and the role of theories in explanation of phenomena associated with International Financial Reporting Standards (IFRS)-based financial accounting research. We provide a review of how the concepts are constructed and defined and describe the functions of the concepts within this research stream. Moreover, we examine the role of theories in explanation of the phenomena.

Concepts are words with a special kind of power, which are used by social science researchers as means to describe social phenomenon, organise knowledge, and provide a framework within which to develop theory. For instance, concepts such as the cost of capital are helpful in organising knowledge within IFRS research into several categories, such as the impact of IFRS on capital markets. The same also applies to other fields in social sciences.[34] These concepts also aid researchers in developing research questions and hypotheses.

Concepts thus serve as the building blocks of theories or theoretically loaded elements of theories (Leiulfsrud & Sohlberg, 2017). Given the power that concepts possess, it is thus necessary that they be defined as clearly possible, since they have an impact on scholars' ability to enhance the knowledge base. Clearly defined concepts are more fruitful and enable scholars to identify qualitative aspects for further elaboration and that can be formed into a model. A clear definition of concepts is thus critical to the foundation underlying a theoretical construction of all theories, which plays an important role in scientific explanation; this is the major goal of all sciences (Reiss, 2013).

Concepts in the social sciences, however, are usually loosely defined. This hinders researchers from achieving the ultimate purpose behind their scientific inquiries (i.e., to build knowledge). This undermines the fruitfulness of the concepts and impedes one's ability both to enhance the knowledge base and develop models to explain the phenomena. Since IFRS-based financial accounting research appears to confront this issue, it is difficult to reconcile the results of the studies on the topic. In this paper, we therefore address the issues of conceptual formation and the role of theories in explanation within this research stream.

A major aim of IFRS-based financial accounting research is to explain and predict the effects of IFRS adoption on capital markets using a variety of scientific tools and methods. This

[34] For instance, in supply chain management. For more details, see Tsao (2015), Sayyadi and Awasthi (2018), and Hao, Helo, and Shamsuzzoha (2018).

provides a picture of how the current practice of reporting under IFRS has affected the economy and whether there is any need for policy development to address such effects. We therefore also review the different forms of theoretical explanation that are found in selected IFRS-based accounting research articles and address important questions regarding the scientific basis of the bulk of the research within this field in terms of justification, reasoning, research method, and argumentation.

We used a sample of eight scholarly articles within IFRS-based financial accounting research spanning from 2008–2021, including both recent studies and ones that emerged soon after mandating of IFRS by the EU in 2005. Moreover, we include studies representing both EU and Non-EU contexts so that our sample may be heterogenous in terms of country contexts.

We contribute to the literature in a number of ways. First, to the best of our knowledge, this is the first study to provide an understanding of conceptual formation and explanation in IFRS-based accounting research. Most of the extant research has focused on the role of paradigms and validation in management accounting and addressed the shift from a post-positivist to critical realist paradigm in financial accounting research (Baldvinsdottir, Mitchell, & Nørreklit, 2010; Lukka, 2010; Lukka & Modell, 2010). We address the role of inductive and deductive reasoning in developing the theory and the conceptual apparatus used here, which has been a topic of little attention in the extant research.

By illustrating these issues, we offer insight into conceptual formation and methodological choices researchers have undertaken to position the research in relation to various IFRS studies; this permits the development of a more fruitful body of knowledge within this research stream. For instance, the theoretical understanding of concepts such as depreciation, amortisation, and accounting profit has been key to understanding various phenomena that IFRS-based financial accounting research aims to explain.

We structure the paper as follows. First, we provide a review of conceptual formation in social sciences in general. In this section, we provide a description of the different ways concepts are formed in social sciences including examples from IFRS-based accounting research. These descriptions are used in the analysis and commentary on the sample articles. We then briefly outline the research philosophy and methodology underlying IFRS-based accounting research. Next, we review eight articles on IFRS-based financial accounting research and address the issues related to conceptual formation and explanation in these articles.

2.0 CONCEPTUAL FORMATION IN SOCIAL SCIENCES AND IFRS-BASED FINANCIAL ACCUNTING RESEARCH

Concepts are words that serve as the foundation of theoretical construction in all sciences, acting as the building blocks of theories. Concepts can thus be considered heuristic and theoretical tools. As such, it is important to distinguish between two aspects when considering concepts. One aspect relates to the very construction of the tools. Here, we are concerned with how the concepts are constructed. The second aspect is related to the application of these tools. Here, we are interested in learning about the consequences of the use of concepts and what functions they fulfil (Leiulfsrud & Sohlberg, 2017).

Concepts in social sciences, unlike in IFRS-based financial accounting research, are typically loosely defined and should therefore be assessed in terms of their fruitfulness and not their truth value (Leiulfsrud & Sohlberg, 2017). Looking at the fruitfulness of a concept from an inductive perspective means that important qualitative aspects that are to be further elaborated upon and eventually crafted into a model or a theory are identified from the patterns that are expressed in the conceptualisation process. Fruitfulness, in this case, refers to a concept's deductive potential (Merton, 1968). From the deductive perspective, a concept is fruitful if it identifies important qualitative aspects of a topic that are ripe for further investigation. Regardless of the approach a given research project takes, finding an argument to distinguish between inductive and deductive forms of fruitfulness is difficult (Leiulfsrud & Sohlberg, 2017). Not all IFRS-related articles exhibit fruitfulness, however.

Identifying the conceptual space is one way to approach the vocabulary in which a concept is embedded. Conceptual space refers to how a concept relates to other concepts, which can sometimes be a matter of theoretical logic but is more commonly a question of the contingent relations established in the sociological tradition (Leiulfsrud & Sohlberg, 2017; Sohlberg, 1999). For instance, consider the concept of accounting quality. This is usually defined in terms of the extent to which a certain set of accounting numbers facilitate the measurement of some economic performance. 'A certain set of accounting' and 'any economic performance' could vary immensely in terms of content. This makes functional reasoning complex and diffuse in general terms, like the various instances in the body of IFRS research that address whether accounting quality has improved after the standards were mandated in the EU. Thus, to address accounting quality, one must approach this concept through the vocabulary or context it is embedded in.

Concepts in the social sciences can be constructed in either an inductive or deductive way. The inductive approach places emphasis on observation and deriving conclusions through observation (Zalaghi & Khazaei, 2016). Thus, inductively formed concepts are based on patterns revealed through observation and generalisation. As a mode of inference, induction is always open-ended (Leiulfsrud & Sohlberg, 2017). On the other hand, the deductive approach mainly involves developing hypotheses or assumptions based on existing theories and testing those hypotheses (Zalaghi & Khazaei, 2016). Thus, forming concepts under this approach is simply an operationalisation of a theoretical category, which is rarely a matter of formal logic. It can thus be seen as a way to structure an empirical field (Leiulfsrud & Sohlberg, 2017). One can find some examples of such approaches in IFRS-based accounting research (e.g. Bodle, Cybinski, & Monem, 2016; Charitou, Karamanou, & Lambertides, 2015; Christiansen, Lee, Walker, & Zheng, 2015) and other social science disciplines such as supply chain management (e.g. Gharaei, Karimi, & Shekarabi, 2019; Giri & Bardhan, 2014; Yin, Nishi, & Zhang, 2016).

Lazarsfeld and Rosenberg (1955) deeply influenced the way sociologists at Columbia University approached the concepts. These sociologists approached the concepts from a methodological perspective, insofar as methodology not only deals with theoretical issues but also with research methods. Based on Lazarsfeld and Rosenberg (1955) publication, Lazarsfeld (1966) formulated a basic approach about how to use concepts, consisting of four steps. Step 1 states that a researcher must have some general idea (i.e., 'imagery') of a concept.[35] In step 2, a researcher must divide the imagery into its components. Step 3 requires the researcher to be inventive, as it involves the location of empirical indicators. In step 4, the researcher must construct the indices and close the gap between reality and the concept (Swedberg, 2017). Notably, IFRS-based accounting research involves concepts that are mainly formed through deduction. The imagery, thus, does not play a major role in this research stream. In this field, most concepts are borrowed from past research and take the form of variables. Thus, scholars typically do not seem to follow the Lazarfeld's approach with complete fidelity.

Colligation is yet another method that can be used to construct concepts in social sciences. This is an open concept that has not been used frequently. Here, the word 'colligation' means 'binding together through an idea'. The main idea of colligation is that facts related to a

[35] Lazarsfeld did not believe in producing definitions of concepts, and he was not very interested in the initial phase of concept formation (Swedberg, 2017). Hence, the term 'imagery' is used.

scientific phenomenon are bound together in an analytically useful manner through an idea (Swedberg, 2017).[36]

Concepts in the social sciences are also sensitised. The optimal way to proceed here is to begin with an initial flexible concept and to refine it during the course of research (Blaikie, 2000). In contrast to a definitive concept, a sensitising concept does not have a clear definition based on specific criteria or properties (Blumer, 1969). Therefore, the main purpose of sensitising concepts is to open the field for exploration and help researchers look in a specific direction without locking oneself into a certain understanding of a phenomenon (Sohlberg & Sohlberg, 2013). Sensitising concepts serve as heuristic devices and enable researchers to become acquainted with the subject of their research, allowing them to identify new relationships, perspectives, and worldviews (Flemmen, 2017).

3.0 RESEARCH PHILOSOPHY AND METHODS IN IFRS-BASED FINANCIAL ACCOUNTING RESEARCH

Notably, IFRS-based financial accounting research is a subset of financial accounting research, a field which is mainly dominated by 'mainstream' accounting research conducted within a positivist paradigm. Financial accounting research has its origins in the 1960s when Ball and Brown (1968), Beaver and Manegold (1975), and other researchers introduced empirical finance methods to financial accounting. Since that time, theory construction and verification in such research have been conducted within a positivist paradigm, with empiricism being the critical research doctrine.

Research within this paradigm holds an objective and independent view of reality, favours quantitative methods, and presupposes that accounting phenomenon can be explained, predicted, and discovered using scientific research approaches (Ryan, Scapens, & Theobald, 2002). Thus, financial accounting research is dominated by an objectivist ontology that provides that the 'reality' of accounting can be discovered through direct observation and objective measurement and that generalisable findings can be produced by testing accounting hypothesis through an appropriate statistical analysis (Bisman, 2010).

[36] For instance, in IFRS-based fianancial accounting research, the concepts appear to be bound through the idea of financial reporting quality. In other social science areas such as supply chain management, they seem to be linked through the idea of efficient and sustainable supply chain management. See the following studies for more examples of colligation: Christensen, Lee, Walker, and Zeng (2015); Barth, Landsman, and Lang (2008); Rabbani, Foroozesh, Mousavi, and Farrokhi-Asl (2019); and Rabbani, Hosseini-Mokhallesun, Ordibazar, and Farrokhi-Asl (2020).

Much of the IFRS-based financial accounting research is undertaken from the perspective of positive accounting theory (Bisman, 2010) and falls into the capital market research paradigm. Furthermore, IFRS-based accounting research focuses on the economic consequences of the adoption of accounting standards and strives to predict and explain the impact of adopting the standards on the informational efficiency of the stock markets. The research also relies considerably on financial theories, such as the efficient market hypothesis, and uses information from firms' accounting statements (Ryan et al., 2002). Based on these theories, researchers draw hypotheses and use statistical techniques to test them. However, when studying phenomena in IFRS-based financial accounting research, the focus is on interpretation rather than on prediction or explanation.

The methodological basis of IFRS-based financial accounting research lies in the nature of the assumptions and in the linkages between observation and theoretical terms (Ryan et al., 2002) and is derived from the hypothetico-deductive approach. Most IFRS studies include several a priori assumptions that are used to deduce a model and which can be used to compare different accounting practices. Many of these a priori assumptions combine empirical observations of accounting practices with economic theory. Researchers then use the resulting models for empirical testing. This contrasts with the empirical inductive approach employed by early accounting researchers, which involved surveying and synthesising accounting practices and then attempting to generalise the principals underlying the observed practices (Ryan et al., 2002).

Moreover, IFRS-based financial accounting research has a decision usefulness objective. The starting point of this approach is to consider the objectives of the financial statements. Research tends to be driven by motives and intentions stemming from the regulations that cite the benefits of adopting the IFRS (Ryan et al., 2002). The problems with this approach are associated with the fact that several of the benefits of IFRS-related research are unobservable and context-dependent. Therefore, the research is theoretical in nature and focuses on the interpretation and meanings of what the empirical findings suggest. The differences in contexts where this research is carried out, however, mean it is often challenging to make generalisations, which are often important to shape and improve policy and practice.

4.0 REVIEW OF SELECTED ARTICLES

We begin by describing the process underlying the selection of articles for this research and the central phenomena the chosen studies address. We then proceed to address the conceptual

formation, explanation, and role of theory within the selected articles. As such, we only selected and reviewed eight articles for this research.

4.1 SELECTION OF THE ARTICLES

Since the studies within IFRS-based financial accounting research have focused mainly on the effects of IFRS adoption on accounting quality, we identified articles using the following keywords: 'IFRS', 'financial reporting quality', and 'effects of IFRS'.

The search produced results that included studies published in economic, accounting, and financial reporting journals that focus on wide range of topics within financial accounting including the effects of IFRS on accounting quality and economic consequences. From the search results, we conveniently selected and reviewed eight articles published between 2008–2021 based on their resemblance to the keyword search. Delimiting the study to the aforementioned time period allowed us to select both seminal and recent articles in this field of research. In order to have heterogeneity with respect to the context of the selected studies, we also included studies that focused on the effects of IFRS adoption in non-European settings, such as those conducted in Korean and Ghanaian context. In addition, we exclude non-published work, conference proceedings and book sections.

Following the EU's adoption of IFRS in 2005, research on the effects of its widespread adoption flourished. Several countries began to adopt or aligning their local standards with IFRS. We thus analysed studies from the year 2008 as these studies form the conceptual and methodological basis for forthcoming articles and capture the initial effects of mandatory IFRS adoption. We focused on later research as well as to capture advances during the selected time period. This facilitates an understanding of the current state of the literature in this research stream in terms of conceptual formation and explanation.

We decided to focus on the Daske, Hail, Leuz, and Verdi (2013) article rather than Daske, Hail, Leuz, and Verdi (2008) work. The reason is that the method and the research questions addressed by both articles are similar. The articles set out in Table 1, below, were considered for further analysis:

Table 1: Articles chosen for the study (numbers in parentheses represent total citations). International Financial Reporting Standards (IFRS)/International Accounting Standards (IAS)

Number	Authors and Year	Title and Journal of Publication
1.	Barth et al. (2008)	International Accounting Standards and Accounting Quality, *Journal of Accounting Research (4080)*
2.	Key and Kim (2020)	IFRS and Accounting Quality: Additional Evidence form Korea, *Journal of International Accounting, Auditing and Taxation (8)*
3.	Christensen et al. (2015)	Incentives or Standards: What Determines Accounting Quality Changes around IFRS Adoption? *European Accounting Review (712)*
4.	Mensah (2020)	The effect of IFRS Adoption on Financial Reporting Quality: Evidence from Listed Manufacturing Firms in Ghana, *Economic Research-Ekonomska Istraživnaja*
5.	Trimble (2018)	A reinvestigation into accounting quality following Global IFRS Adoption: Evidence via Earnings Distributions, *Journal of International Accounting, Auditing and Taxation (12)*
6.	Daske et al. (2013)	Adopting a Label: Heterogeneity in Economic Consequences Around IAS/IFRS Adoptions, *Journal of Accounting Research (986)*
7.	Barth, Landsman, Lang, and Williams (2018)	Effects on Comparability and Capital Market Benefits of Voluntary IFRS Adoption, *Journal of Financial Reporting (20)*
8.	Li, Siciliano, and Venkatachalam (2021)	Economic Consequences of IFRS Adoption: The Role of Changes in Disclosure Quality Economic Consequences of IFRS Adoption: The Role of Changes in Disclosure Quality, *Contemporary Accounting Research (3)*

The central phenomena these articles address is whether the adoption of IFRS resulted in the improvement of accounting and reporting quality and IFRS's economic consequences. The

central research question the first five articles address is whether the adoption of IFRS (either voluntary or mandatory) resulted in improved accounting quality when compared to local generally accepted accounting principles (LGAAP). The central phenomena the sixth and eighth article examine and assess are the observed economic consequences around IFRS adoption, while the seventh assesses whether voluntary IFRS adoption resulted in improved comparability of accounting amounts.

The authors of these studies related to IFRS adoption and accounting quality (i.e., the first five articles) address the central phenomena under study by examining changes in earnings management, timely loss recognition, and earnings distributions, as well as the variability of changes in net income relative to the changes in cash flow variability. Daske et al. (2013) address their central research questions through the use of measures, such as the price impact of trades, percentage bid-ask spreads, and the implied cost of capital, while Barth et al. (2018) cross-compare the accounting amounts produced by local standards and IFRS. Li et al. (2021) address their central research question by measuring changes in disclosure quality.

The methodology the authors use to answer their research questions is empirical in nature. While using theory, the authors define a model, which consists of variables. They then test the model using statistical techniques such as regression analysis. Next, the authors use significance levels to accept or reject their hypotheses and craft explanations for the phenomena through interpretation of the empirical results. The findings of these studies are mixed, which makes it difficult to reach a conclusion as to whether IFRS adoption has resulted in any change in accounting quality, economic consequences, or comparability.

4.2 CONCEPTUAL FORMATION IN IFRS BASED FINANCIAL ACCOUNTING RESEARCH: THE CASE OF SELECTED ARTICLES

The central concepts addressed in studies by Barth et al. (2008), Christensen et al. (2015), Trimble (2018), Key and Kim (2020), and Mensah (2020) belong to the conceptual space of accounting quality. The accounting quality can itself be assessed using different measures that vary immensely in terms of the contexts they are applied to. On the other hand, Daske et al. (2013), Barth et al. (2018), and Li et al. (2021) studies include concepts that belong to the conceptual space of economic outcomes and accounting amounts. These conceptual spaces can also vary immensely in terms of their contexts. Thus, a contextless discussion relating to accounting quality or economic outcomes is impossible. The authors of the chosen studies also

use various combinations of accounting concepts (such as accounting ratios) to examine the phenomena in their papers.

The concepts used by the studies that assess the impact of IFRS adoption on accounting quality are ambiguous, and definitions vary across the articles. Several concepts include sub-concepts in order to study a phenomenon effectively, and the concepts are thus embedded within one another. For instance, research articles that examine accounting quality employ concepts such as 'earnings management', 'timely loss recognition', 'value relevance', and 'earnings distributions'.[37] In Christensen et al. (2015), the authors define earnings management using the three sub-measures: 'the variability of changes in earnings, variability of changes in earnings relative to the variability of changes in cash flows and the negative correlation between accruals and cash flows'. Key and Kim (2020) use a similar definition of earnings management, while Barth et al. (2008) scaled net income by total assets and measured the variability of changes in earnings relative to variability of changes in operating cash flows. Mensah (2020) measured earnings management through discretionary accruals. In contrast, Trimble (2018) measured accounting quality using earnings distributions, which Trimble defines as the discontinuity of earnings distributions at the zero earnings threshold. Barth et al. (2008) defined timely loss recognition as the coefficient on the large negative income of regressions of this variable (along with other controls) on the dummy variable indicating whether the firm adopted International Accounting Standards (IAS). The study by Key and Kim (2020) follows the same definition, while Christensen et al. (2015) scaled net income by total assets. Christensen et al. (2015) and Barth et al. (2008) measured value relevance, using concepts like share price, earnings per share, and book value per share. These authors base their work on the results of regressions of stock price on net income. The remaining articles define the concepts the authors use in the articles explicitly within their studies; however, the scope of their definitions are narrow. For instance, Barth et al. (2018) focus on accounting amounts of the book value of equity, net income, and net income before extraordinary items, while Daske et al. (2013) measured their economic outcomes using three concepts. Furthermore, Li et al. (2021) use a two-step research design to determine the economic consequences of IFRS adoption.

The studies generally appear to use existing concepts and methodologies from mainstream financial accounting research including certain instances of within field use. Key and Kim (2020), for instance, state that they 'apply the methodology of Barth et al. (2008)', which

[37] The studies using these concepts are mentioned in Table 1.

indicates that their analysis relies on existing concepts and attempts to enhance the meaning of those concepts when used in a different setting. In Barth et al. (2018) study, the authors state that 'All of the accounting quality metrics are based on previous research'. In a recent study, Li et al. (2021) state that they 'use the level of disaggregation of accounting numbers reported in financial statements proposed by Chen, Miao, and Shevlin (2015)'. One can find similar statements in the other studies, suggesting that the authors have taken concepts from previous research and applied them in various settings.

With the exception of for Daske et al. (2013), the concepts the authors use in these studies do not appear to follow Lazarsfeld's approach completely. Imagery and the formulation of indices did not play any role in these studies. Daske et al. (2013) appear to follow Lazarsfeld's approach to conceptual formation. The authors make use of 'latent' or unobserved constructs formulated using an economic theory that one can measure, such as reporting incentives. One could view this as the 'imagery' of the concept. The authors then specify the construct and chose empirical indicators, which they use in an attempt to close the gap between reality and the concepts (Lazarsfeld & Rosenberg, 1955).

The concepts in all the studies play primarily a deductive role or are formed in a deductive way. Furthermore, the central phenomenon is operationalised using existing concepts. For instance, in Daske et al. (2013) study, the authors measured the central phenomenon using three existing concepts. Barth et al. (2018) wrote: 'We operationalize accounting quality using earnings management, timely loss recognition and value relevance metrics'. After being operationalised, the concepts were then transitioned into an empirical setting in the form of variables. The inductive part of the process led to the formation of informative patterns, which aid in understanding the phenomenon (Swedberg, 2017). The authors identified patterns from the qualitative assessment of the model, which they then described and offered meaning.

The concepts in the studies by Barth et al. (2018), Trimble (2018), Mensah (2020), and Christensen et al. (2015) appear to identify the qualitative aspects which require further elaboration (albeit only within the context of their papers). The concepts used in the studies could also be seen as sensitising concepts, as they open up the field for further investigation. Moreover, in a sense, the concepts are borrowed from past research and amplified in the authors' work. They are thus heuristic devices. The authors elaborate on the concepts and form them into models that they then test. The studies other than the above, however, did not identify

any future research areas, and the patterns expressed do not identify any qualitative aspects for further elaboration.

The main function of the concepts in the selected studies is to form a structure among the variables. All the selected studies have used variables based on past research. Then, the authors form higher-level aggregate structures based on the assumption of causal power arising from these structures. The authors first identify relationships between IFRS adoption and its effect on the phenomena in question. The authors then form the variables to specify a higher order economic structure to assess whether IFRS adoption had any effect on the phenomena they examine.

The concepts in the selected articles also appear to be formed through colligation. The concepts in the studies are bound through the general essence of the phenomena the authors are investigating. The authors also tie certain facts to this idea and show that IFRS adoption has affected the phenomena they are investigating. Later, the authors bind these facts and analyse the phenomena. The formation of concepts in these works thus follows the approach in Swedberg (2017).

4.3 EXPLANATION AND THE ROLE OF THEORY IN THE SELECTED ARTICLES

In all the articles, the authors begin by mentioning the explanandum or the phenomenon of interest in their study that is associated with the effects of IFRS adoption. The authors use concepts, in the form of variables, to create a model. The authors next derive explanans or hypotheses and subsequently test them using empirical analysis. If statistical significance is attained, then the authors consider the explanans to be successful in explaining the phenomenon.

Based on the observations of other accounting standards that may be similar to IFRS, the authors produce hypotheses, which they test in a new setting. This is the hypothetical aspect of the theory. However, in some of the studies the authors do not explicitly state their hypotheses in the form of statements. Rather once the authors arrive at a hypothesis, they deduce statements describing the phenomena from the theoretical statements.

The authors link the concepts of the theories to the concepts describing the phenomena. In this sense, theories also serve to provide a functional explanation. The texts first consider the phenomenon that is being investigated. The authors form variables to measure the phenomena being investigated, and thus they aid in the explanation of the main phenomenon. The questions

about the relationship between the parts and the whole to which they belong is explained. These authors then use the relationships to predict the phenomena.

The nature of the explanations in the selected studies appears to be mechanistic. One could view the mechanism in the studies as an underlying structure or a process. The papers examine the change in the information environment through IFRS adoption. Thus, one could view adoption of IFRS as the process that leads to changes in the information environment. Li et al. (2021), for instance, mention that IFRS causes changes in disclosure quality which further leads to changes in economic consequences around IFRS adoption. Hence, the nature of the authors' explanation appears to be mechanistic.

5.0 DISCUSSION

The central phenomena addressed in IFRS-based financial accounting research is the assessment of accounting quality after the standards were adopted and their effect on capital markets. Much of the theory construction and conceptual formation is conducted within the positivist paradigm and the research thus strives to present an objective reality.

Conceptual formation and the role of theories in explanation is the same across the sample. These studies appear to benefit from the theories and concepts used in past research. This is expected, given that the field is relatively new; the EU first mandated IFRS in 2005, prompting IFRS-based accounting research in subsequent years. Naturally, in the period after a particular field establishes itself, it gradually develops its own concepts and theories. The role theories play in explaining the phenomena, however, remains the same.

Research on IFRS-based accounting has mainly been conducted within the positivist paradigm, which offers a highly objectivist view of a common single reality. The reality here exists independently of human thought and perception where it can be accurately described and causally explained (Benton & Craib, 2001; Bisman, 2010; Ryan et al., 2002). This positivistic view does not appear to fully comport with IFRS-based accounting research in this sense, as empirical work cannot clearly address the phenomena in question. Standard setters and enforcers do not necessarily exhibit a common pattern of thought and background. This leads to unobservable cross-country and interfirm differences that the empirical model does not account for. This calls for considering other philosophical lenses that can assist in incorporating the unobserved or qualitative aspects of the research. For instance, IFRS-based financial accounting research could offer a critical realist perspective that allows researchers to match their research questions with particular methods while maintaining a sound empirical basis,

appreciating exactitude in research investigations and the idiographic and contextual nature of human behaviour, and remaining cognisant of the role accounting information plays in society (Bisman, 2010).

Most of the studies in the IFRS-based financial accounting research literature seem to benefit from the use of existing concepts from the mainstream financial accounting research including certain instances of within field use. Though not currently very common, this research stream could also benefit from more studies that use sociological or behavioural concepts rather than being referred to a particular topic. The use of behavioural concepts could, for instance, enhance the body of knowledge on financial reporting behaviour as Guermazi and Halioui (2020) show. This would add a significant wealth of ideas that will enable research to be integrated into a sociological tradition where one not only produces research based on an exclusive topic, but also refers to concepts and theory and influences future research (Swedberg, 2017).

Concepts in financial accounting research are defined loosely. Their definitions may vary across different research contexts. This makes it challenging to integrate the findings of empirical research into the discipline. Given that most studies use concepts in the form of variables, IFRS-based accounting research arguably belongs to the operationalising research tradition where concepts are specified and measured to produce variables for research. This approach has been criticised both for not being sufficiently radical and for assuming and strengthening pre-existing differences. However, some concepts are also sensitising insofar as they open up the field for further investigation. This also suggests that concepts are used as means to establish a connection with the empirical world (Flemmen, 2017); this is present in all of the chosen studies.

In the context of chosen studies, the IFRS based accounting research appears to utilise hypothetico-deductive forms of explanation where theories are only used to deduce statements about observable patterns (Benton & Craib, 2001). The definitions of the concepts are offered here to link concepts that appear in the theory with the concepts used in the description of the phenomena that are to be explained. These definitions could be seen as bridging principle that could be interpreted in different ways. Given the positivist nature of IFRS research, one could view these definitions merely as formal rules (i.e., bridging principals) for translating theoretical concepts into empirical ones. These, however, do not commit the researcher to belief in the reality of the phenomena assumed in the theories. Alternatively, these bridge

principals might also be viewed as containing substantive knowledge claims in their own right (Benton & Craib, 2001). The nature of the quantitative relationship between IFRS adoption and the outside world of financial reporting needs to be investigated thoroughly as one cannot simply use theoretical concepts and their definitions.

The aim of much of the IFRS based financial accounting research has been to work with above-mentioned phenomena. However, the conclusions of the research are not fully attributable to IFRS adoption. This might hint at theoretical inadequacy and one way to address this issue is developing a better understanding of the mechanisms involved, which the extant research seems to provide only a vague understanding. Though our sample size for this review is small, it however provides preliminary insights into conceptual formation and explanation within IFRS based financial accounting research.

5.1 LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

To a great extent our findings can have external value. Our sample consists of highly cited articles with country context variations and belonging to a range of time period. However, our study has certain limitations. For example, while our paper attempts to offer an overview of conceptual formation in IFRS-based financial accounting research, our analysis is based on a rather small sample of eight articles. Consequently, we cannot claim our review offers a representative snapshot of the relevant issues within the field, and our study should be viewed as preliminary assessment. Moreover, our review was rather narrow in its topical scope, focusing mainly on conceptual formation and explanation. This scope could be broadened in future research to offer a more elaborate analysis of other philosophical issues related to the field.

Based on the above, we suggest the following for future research. First, we suggest that future studies explore the issues raised in this paper in the context of other articles within the field. Second, we recommend that future IFRS-based accounting studies should incorporate sociological and behavioural concepts to broaden the diversity and enhance the fruitfulness of the research field. Further, future research should take a critical realist perspective, which could potentially benefit accounting research agendas in providing an in-depth understanding of the economic, regulatory, social, and political effects and uses of accounting.

6.0 CONCLUSIONS

In this paper, we addressed conceptual formation and different forms of explanation in IFRS-based financial accounting research. Our review suggests that most IFRS-based financial accounting research is conducted within a positivist paradigm and uses concepts from existing research. Further, the central phenomena this type of research examines is the effect of IFRS adoption on accounting quality and information environment. The concepts are mainly formed in a deductive way, and the methodology applied within this research field is strictly empirical. In these studies, the explanation tends to be mainly mechanistic. We recommend more research in the future relating to the issues we have raised in this paper.

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Chapter 7

Discussion and Conclusion

1.0 DISCUSSION

The purpose of this thesis is to address the impact of IFRS adoption on the risk aspect of companies in adopting countries and to review the conceptual formation and the role of theories in explaining the phenomena within IFRS-based financial accounting research. From the literature review, it was identified that the extant research has neglected the issue of how IFRS adoption has impacted the risk of the companies that use the standards for their financial reporting purposes. Moreover, the research to date has not focused extensively on the conceptual formation, role of paradigms, philosophical foundations, or use of theories in explaining the phenomena within IFRS-based financial accounting research. To extend the research field in light of the abovementioned dimensions, the following issues are addressed in Chapters 3–6 of this thesis:

1. IFRS adoption and its impact on the transparency of the firms from a bankruptcy prediction perspective.
2. IFRS adoption and its impact on the systematic risk and return of the common stock.
3. IFRS adoption and its impact on the abnormal volatility of the firms involved in M&A.
4. Conceptual formation and the role of theories in explaining the phenomena in IFRS-based financial accounting research.

The discussion below briefly examines these issues in light of the main goal of this thesis and is followed by several limitations and a conclusion.

1.1 DISCUSSION ON ISSUE NO. 1

This issue focuses on whether using IFRS can result in transparency through a bankruptcy prediction perspective. The main finding is that the use of IFRS appears to improve bankruptcy prediction in comparison with NGAAP and thus results in financial reporting being more transparent. This finding seems to align with Bodle, Cybinski, and Monem (2016), who analyzed the issue of IFRS and bankruptcy prediction in the Australian context. Furthermore, studies by Charitou, Karamanou, and Lambertides (2015) and Wu and Zhang (2014) also found that using IFRS results in an improved ability to identify the firms that exhibit deteriorating

characteristics. In addition, Florou, Kosi, and Pope (2017) found that the accounting numbers of listed entities using IFRS better explained credit ratings after they adopted IFRS.

The differences in bankruptcy prediction can be attributed to the specific differences in how various accounting components are recorded under the two standards. For instance, IFRS require the impairment of the goodwill component, while NGAAP permit its amortization. Furthermore, the development expenditures are classified as intangible assets under IFRS (Picker et al., 2016), in contrast to expenses under NGAAP. It is these differences and those identified by Gjerde, Knivsflå, and Sættem (2008) that lead to the differing pictures of bankruptcy prediction and transparency under the two accounting standards. These differences are also reflected in the magnitude and signs of the coefficients.

1.2 DISCUSSION ON ISSUE NO. 2

This research question studies the relationship between IFRS adoption and the systematic risk of the common stock in the context of the companies listed on the Oslo Stock Exchange. The main finding is that the use of IFRS appears to reduce the systematic risk of the common stock. IFRS adoption was a widescale event that affected many listed companies within Europe and the EU. Hence, it is not surprising that the adoption impacted the systematic risk of the common stock of the listed companies that were mandated to use IFRS.

The finding also seems to align with other academic studies that have argued that financial reporting under IFRS is beneficial for firms, in that it increases transparency, decreases the cost of capital, and improves accounting quality (Daske, Hail, Leuz, & Verdi, 2008, 2013; George, Li, & Shivakumar, 2016). Furthermore, the studies mentioned in the literature review also claim that financial reporting under IFRS presents earnings in a more timely manner, which results in improved accounting quality and reduces earnings management (Cadot, Reazee, & Chemama, 2020; George et al., 2016; Salewski, Teuteberg, & Zülch, 2014). This appears to be reflected in the negative coefficient value for the accounting beta, which measures the cyclicality of the earnings, in Chapter 4. Thus, the use of IFRS seems to be associated with an improved information environment, which may result in the reduction of the systematic risk of the common stock for the reporting entities.

While it appears that using IFRS reduces the systematic risk of the common stock, the coefficient of *IFRS* has a very low predictive power, despite being statistically significant. This may depend on the differences between the accounting standards in question, that is, NGAAP and IFRS. For instance, IFRS require the recognition of fair value of assets on the accounting

statement, while NGAAP conversely require that assets be recognized at cost. However, in case of difficulties in measuring fair value, IFRS also permit recognizing assets at cost (Gjerde et al., 2008). This could thus result in reported numbers not differing greatly between the two accounting standards. Hence, the predictive coefficients could have low predictive power. Moreover, IFRS and NGAAP are largely similar, except in some aspects related to recognizing intangibles, pension benefits, and other accounting posts, as identified in Gjerde et al. (2008).

1.3 DISCUSSION ON ISSUE NO. 3

This issue focused on the impact of IFRS adoption the abnormal stochastic volatility (SV) of the entities involved in merger and acquisition (M&A) activity. The main finding is that IFRS adoption increases abnormal SV during M&A. This contrasts with the findings of the other studies (including the two prior chapters of this thesis), which found a lower cost of capital and improvement in transparency post IFRS adoption (Daske et al., 2013; George et al., 2016; Yip, Liu, & Young, 2019). One reason for this could be that the extensive use of fair values under IFRS (which are primarily market based) may add to the uncertainty associated around the event date. Furthermore, the fact that goodwill is a natural component that arises for entities involved in such events and that IFRS requires its impairment (Picker et al., 2016), in contrast to other accounting standards that allow for a different treatment of goodwill, may further add to the uncertainty associated around the M&A announcement. Moreover, the impairment of the goodwill itself involves estimating its value based on the cashflows generated by the acquired assets and liabilities of the company. If cashflows are not being generated as expected, the fair value of the goodwill is reduced by the impairment charge. This uncertainty around the amount of cashflows generated and the impairment charge might lead to an increase in abnormal volatility generated during M&A. This may also imply that the market picks up this information in a way that may increase abnormal volatility prior to the M&A announcement date.

1.4 DISCUSSION ON ISSUE NO. 4

The purpose here was to investigate and review the conceptual formation and the role of theories in the explanation of the phenomena associated with IFRS-based financial accounting research. The central phenomena addressed in this research stream is the assessment of accounting and financial reporting quality post IFRS adoption. Much of the research is conducted within the positivist paradigm, and it strives to present an objective reality.

We find the conceptual formation and the role of theories in the explanation of the phenomena to be the same across the sample. All of the chosen studies seem to take advantage of the theories and concepts used in past research. Moreover, most of the studies within this research stream also seem to make use of the concepts from the mainstream financial accounting research stream. This is expected, as the IFRS-based financial accounting research field emerged in 2005, after the IFRS were mandated by the EU and is relatively new; it may take time for the stream to gradually develop its own concepts and theories.

In our chosen studies, we find that IFRS-based financial accounting research appears to utilize hypothetico-deductive forms of explanation, wherein theories are used only to deduce statements about observable patterns (Benton & Craib, 2001). Concepts are defined in a manner that links the theories with the concepts used in the description of the phenomena that are to be explained. These definitions of concepts could be viewed as bridging principles that could be interpreted in different ways; given the positivistic nature of the IFRS-based financial accounting research, one could view the definition of concepts as formal rules for translating theoretical concepts into empirical ones. These bridging principles, however, do not commit the researcher to belief in the reality of the phenomena assumed in the theories. Thus, the nature of the quantitative relationship between the outside world of financial reporting and IFRS adoption must be investigated in depth.

2.0 LIMITATIONS OF THE THESIS AND FUTURE PERSPECTIVES

Although the present thesis offers theoretical and practical insights into the effects of IFRS adoption on companies' risk, this thesis is not without limitations that should be considered for future research.

One of the common limitations within the IFRS-based financial accounting research is the difficulty of filtering out the effects of confounding events around the adoption of IFRS. This also applies to this thesis, which implies that the observed benefits of IFRS adoption, such as reductions in the systematic risk of the common stock and lower costs of capital, could also be the result of other concurrent (confounding) events combined with IFRS adoption. Hence, future research should focus on developing research designs that could be used to analyze the contribution of IFRS alone on risk and other aspects of companies.

Several studies within this research stream have controlled for cross-country differences. However, in certain contexts, it is difficult to capture differences in firm characteristics that could influence the financial reporting behavior. This also makes it difficult to attribute the

findings of the thesis solely to IFRS adoption. Moreover, it is also difficult to obtain officially certified reports based on both IFRS and local GAAP, as most companies publish only one set of financial statements under a single set of accounting standards. Future research could therefore investigate the issues in this thesis by restating local GAAP financial statements into IFRS wherever possible.

One issue related to the time of bankruptcy in Chapter 3 can be seen as too difficult to resolve. When predicting bankruptcy, we use the date when the firm legally declared bankruptcy, although the firm could nevertheless be bankrupt long before the official declaration. It is not possible to obtain any data on this. We thus recommend caution with regards to this issue while interpreting the results. Problems of a similar nature are also prevalent in Chapter 5 of this thesis, where we assume that M&A deals were priced fairly and that information asymmetry was absent. Hence, we also urge caution while interpreting the results of this chapter.

Another limitation of this thesis is the small sample size in Chapters 4 and 5, due to the narrow context of this thesis, which focuses on Sweden and Norway and firms that report under IFRS. This also limits the generalizability of the results to other contexts. Future research could thus examine the issues raised in this thesis in multi-country contexts. This would enable cross-country comparisons on the effects of IFRS adoption in different contexts.

The limitation of small sample size also applies to Chapter 6, where we review eight articles to assess the conceptual formation and the role of theories in the explanation of IFRS-based financial accounting research. While the articles we reviewed could be considered representative of the field (based on the number of citations), the study should still be viewed as a preliminary assessment. We thus recommend that future researchers broaden the scope of this study to provide an elaborate analysis of other philosophical issues related to the field.

3.0 CONCLUSION AND IMPLICATIONS OF THE THESIS

The thesis has examined the impact of IFRS adoption on the risk aspect of the reporting entities and provided preliminary insights into the conceptual formation and the role of theories in explaining the phenomena investigated within this research stream. The main findings of this thesis suggest that IFRS adoption appears to have impacted the risk of the entities that adopted it, and the research conducted within this field belongs mainly to a positivistic paradigm and uses concepts from existing research.

First, it was found that IFRS-based financial reporting appears to improve bankruptcy prediction. This could imply that accounting regulations under IFRS are strict, improve transparency, and prevent managers from engaging in window dressing or creative accounting practices to hide their true situations. This can aid in providing a clear picture of the firm to lending institutions, investors, and other related parties, who can then make sound decisions on whether to support the entity.

The second finding of this thesis is that IFRS adoption appears to have impacted the risk of the entities by lowering the systematic risk of the common stock and increasing the stochastic volatility of the companies involved in M&A. This may suggest that information environment and transparency are vital for financial markets to function effectively. This finding is also useful for various financial institutions, such as mutual funds and investment banks, in deriving various risk hedging strategies.

Finally, we find that IFRS-based financial accounting research is conducted within a positivist paradigm and examines the effects of IFRS adoption on accounting quality and information environment. The concepts are formed in a deductive manner, and the methodology used is strictly empirical. To make this research field more fruitful, one could thus consider incorporating behavioral concepts to the existing research conducted in this field. Furthermore, alternative perspective, such as that of a critical realist, could provide in-depth understandings of the issues investigated in financial accounting research. This is left to future research.

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ISBN 978-82-326-7042-0 (printed ver.)
ISBN 978-82-326-7041-3 (electronic ver.)
ISSN 1503-8181 (printed ver.)
ISSN 2703-8084 (online ver.)

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Norwegian University of
Science and Technology