

Zishan Lin

Research on discretion in accounting

Evidence from the adoption of IAS 19R



ACTA WASAENSIA 453



Vaasan yliopisto
UNIVERSITY OF VAASA

ACADEMIC DISSERTATION

*To be presented, with the permission of the Board of the School of Accounting
and Finance of the University of Vaasa, for public examination
on the 7th of December, 2020, at 10 am.*

Reviewers Professor Aila Virtanen
 Jyväskylä University School of Business and Economics
 P.O. Box 35
 FI-40014 UNIVERSITY OF JYVÄSKYLÄ
 FINLAND

Professor Ann Jorissen
University of Antwerp
Prinsstraat 13
2000 Antwerpen
BELGIUM

Julkaisija Vaasan yliopisto	Julkaisupäivämäärä Marraskuu 2020	
Tekijä(t) Zishan Lin	Julkaisun tyyppi Väitöskirja	
ORCID tunniste	Julkaisusarjan nimi, osan numero Acta Wasaensia, 453	
Yhteystiedot Vaasan yliopisto Rahoituksen ja laskentatoimen akateeminen yksikkö Laskentatoimi PL 700 FI-65101 VAASA	ISBN 978-952-476-932-7 (painettu) 978-952-476-933-4 (verkkoaineisto) http://urn.fi/URN:ISBN:978-952-476-933-4	
	ISSN 0355-2667 (Acta Wasaensia 453, painettu) 2323-9123 (Acta Wasaensia 453, verkkoaineisto)	
	Sivumäärä 190	Kieli englanti
	Julkaisun nimike Harkinnanvaraisuus laskentatoimessa: Havaintoja IAS 19R -standardin käyttöön otosta	
Tiivistelmä Väitöskirja tutkii IAS19-standardin vuonna 2013 korvanneeseen IAS19R Työsuhde-etuudet-standardiin liittyviä harkinnanvaraisia kirjanpidollisia ratkaisuja. Erityisesti tarkastellaan kahta IAS19R:n esittelemää suurempaa muutosta: ns. putkimenetelmän (mahdollistaa laskennallisten vakuutusmatemaattisten voittojen ja tappioiden kirjaamisen) lakkauttamista ja useiden laskennassa käytettyjen vakuutusmatemaattisten oletusten julkaisemisvaatimuksia (ts. oletukset, joita käytetty eläkekulujen määrittämisessä). Molemmat muutokset vaikuttavat harkinnanvaraisiin kirjanpidollisiin ratkaisuihin, joista putkimenetelmän käyttö lakkautettiin, kun taas vakuutusmatemaattisten oletusten julkaisemiseen liittyvää harkintavaltaa edistettiin. Nämä muutokset aiheuttivat muun muassa seuraavia kysymyksiä: Mitä vaikutuksia julkaisuvaatimuksien käyttöön otosta aiheutuu? Mitkä tekijät selittävät tiettyihin harkinnanvaraisiin kirjanpidollisiin ratkaisuihin päättymisen (ts. putkimenetelmän käytön)? Mitä vaikutuksia IAS19R:n käyttöön otosta seuraa? Tutkimuksen otos koostuu 200:sta satunnaisesti valitusta saksalaisesta, ranskalaisesta, ruotsalaisesta ja italialaisesta yrityksestä, joista on kerätty 400 vuosikertomusta IAS19R-käyttöön oton vuodelta ja sitä edeltävältä vuodelta (IAS19). Muu aineisto on kerätty Orbis- ja Datastream-tietokannoista. Empiiristen tulosten mukaan IAS19R:n käyttöönotto parantaa vakuutusmatemaattisten oletusten tiedottamisen tasoa, mutta heikentää vertailtavuutta yritysten välillä. Havaitaan, että yritykset, joilla on enemmän laskennallisia vakuutusmatemaattisia voittoja ja tappioita, ovat taipuvaisia käyttämään putkimenetelmää viivyttyäkseen niiden tulosvaikutuksen näyttämistä. Lisäksi verrattuna ei-putkimenetelmän käyttäjiin, putkimenetelmän käyttäjät ovat taipuvaisia maksamaan pienempiä osinkoja ja ottavat epätodennäköisemmin IAS19R-standardin varhain käyttöön. Tämän lisäksi havaittiin putkimenetelmän käyttäjien lisäävän velkaantumistasettaan IAS19R:n käyttöönottojaksolla, mutta IAS19R:n ei havaittu vaikuttavan näiden yritysten velkaantumistaseseen pidemmällä ajanjaksolla tarkasteltuna. Tämä väitöskirja edistää tutkimuskirjallisuutta, joka koskee kirjanpidollisia ratkaisuvaihtoehtoja, sääntöjen noudattamisen tiedonantoja, työsuhde-etuutta käsittelevien kirjanpitostandardien muutosta ja yritysten valintoja erilaisten kirjanpitoikäntöjen välillä. Tämän lisäksi tulokset antavat IASB:lle palautetta IAS19R:n soveltamisesta.		
Asiasanat IAS 19R, IAS 19, laskentatoimen harkinnanvaraisuus, IFRS		

Publisher Vaasan yliopisto	Date of publication November 2020	
Author(s) Zishan Lin	Type of publication Doctoral thesis	
ORCID identifier	Name and number of series Acta Wasaensia, 453	
Contact information University of Vaasa School of Accounting and Finance Accounting P.O. Box 700 FI-65101 Vaasa Finland	ISBN 978-952-476-932-7 (print) 978-952-476-933-4 (online)	
	http://urn.fi/URN:ISBN:978-952-476-933-4	
	ISSN 0355-2667 (Acta Wasaensia 453, print) 2323-9123 (Acta Wasaensia 453, online)	
	Number of pages 190	Language English
Title of publication Research on discretion in accounting: Evidence from the adoption of IAS 19R		
Abstract <p>This dissertation examines the discretionary accounting choices using the setting of IAS 19R employee benefits, which replaced the IAS 19 in 2013. More specifically, two main changes under the IAS 19R have been investigated: the removal of the corridor method (i.e. a method to recognize actuarial gains and losses) and the different disclosure requirements of actuarial assumptions (i.e. the estimates used to determine pension cost). Both of the changes are discretionary accounting choices, but the corridor method has been abolished, while the disclosure of actuarial assumptions is encouraged to have more discretion. This situation leaves some questions: What are the effects of adopting discretionary disclosure requirements? What are the determinants of using a discretionary accounting choice (i.e. the corridor method)? What are the effects of adopting the IAS 19R?</p> <p>The sample consists of 200 randomly selected firms from Germany, France, Sweden and Italy, totaling 400 observations that are hand-collected from the annual reports of the sample in the year they first adopted the IAS 19R and one year previously (i.e. under IAS 19). Further data have been collected from Oribis and Datastream databases.</p> <p>The empirical results show that the employment of IAS 19R improves the disclosure level of actuarial assumptions while also reducing the comparability. Moreover, firms with more actuarial gains and losses tend to use the corridor method to defer the recognition of the actuarial gains and losses. Furthermore, compared to non-corridor method users, corridor method users tend to have smaller dividend payments and are less likely to adopt the IAS 19R early. In addition, the corridor method users increase their leverage when adopting the IAS 19R, but the employment of IAS 19R does not have significant effects on their leverage in long run.</p> <p>This dissertation advances the literature relating to discretionary accounting choices, the research on compliance disclosure, the studies investigating the changes of pension accounting standards, and knowledge about how firms choose between different accounting policies. Moreover, it presents feedback to the IASB concerning the application of IAS 19R.</p>		
Keywords IAS 19R, IAS 19, discretionary accounting choices, IFRS		

ACKNOWLEDGEMENT

After I got my master degree in the UK, I planned to continue study on accounting standards. Thus, I searched the Internet and sent an email to Professor Stefan Sundgren, who was very kind and encouraged me to apply for a doctorate. However, I failed my application at that time. So I went back to my hometown and pursued my second choice- to become a lecturer. It was not until one day, I sat around with my colleagues and suddenly realized that my life would remain exactly the same for the next ten to twenty years. I would be stuck in the same daily routine. I was only twenty-three at the time, so why wouldn't I give my initial choice another shot? Therefore, I contacted Professor Stefan Sundgren again and applied for a doctorate for the second time. This time, I got in. Ever since then, I have been on my latest academic journey. Now, I want to express my heartfelt thanks to following people for their support, encouragement and help during my studies.

First of all, I am grateful to my head supervisor, Professor Annukka Jokipii, and my secondary supervisor, Dr. Tuukka Järvinen. They have given me countless support and helps during this process. I owe special gratitude to Professor Stefan Sundgren, who trusted that I could be a researcher and guided me into the academic world. He was always supportive and gave detailed comments for all twelve different versions of my dissertation. This thesis would not have been possible without him. His continuous support motivated me to always make the right decisions, rather than choosing the easy way out throughout my work on this thesis.

I am deeply indebted to my two pre-examiners Professor Ann Jorissen and Professor Aila Virtanen for their brilliant suggestions on the manuscript. I also owe gratitude to Dr. Kim Ittonen for his valuable advice on the earlier drafts of my thesis. In particular, I would like to thank professor Seppo Pynnönen for his suggestions on heteroskedasticity tests. Furthermore, I owe gratitude to all professors, colleagues, administrative staff in the school of Accounting and Finance from university of Vaasa for their support.

Finally, I want to thank all of my family and friends for their company and encouragement during the process and throughout my life. In particular, I would like to express my deepest gratitude to my parents Wei Lin and Liping Huang, for their unconditional love, strong support and understanding.

Xi'an, October 2020

Zishan Lin

Contents

ACKNOWLEDGEMENT	VII
1 INTRODUCTION	1
1.1 Research questions	3
1.2 Main findings, contribution, and structure of the study	5
2 INSTITUTIONAL BACKGROUND.....	8
2.1 An overview of key concepts under IAS 19R Employee Benefits	8
2.2 The development of pension accounting standards issued by IASB.....	13
2.2.1 Pre- IAS 19R (2011)	13
2.2.2 The IAS 19R (2011)	14
2.2.2.1 The exploration of the birth of the IAS 19R.....	14
2.2.2.2 The main changes from IAS 19 to IAS 19R	17
2.3 Summary	22
3 THEORETICAL BACKGROUND	23
3.1 Studies on pension accounting	23
3.2 Studies on IAS 19R	24
3.3 Studies on the disclosure level of actuarial assumptions	26
3.3.1 Studies on disclosures.....	26
3.3.2 Studies on pension disclosures	27
3.3.3 Studies on value relevance of recognition versus disclosure	30
3.4 The use of discretion in pension accounting for earnings	33
3.5 Studies about the economic consequences of adopting pension accounting standards	36
4 HYPOTHESES DEVELOPMENT	39
4.1 The disclosure level of actuarial assumptions	39
4.2 The corridor method	45
4.2.1 The determinants of using the corridor method	46
4.2.2 The non-compliance disclosure about corridor method	48
4.3 The effects of adopting the IAS 19R.....	49
5 DATA AND RESEARCH DESIGN	54
5.1 Sample selection	54
5.2 Descriptive analysis of the sample	56
5.2.1 The industry distribution.....	56
5.2.2 Company information	59
5.3 Empirical models for disclosure level of actuarial assumptions.....	65
5.3.1 Measurement of disclosure level of actuarial assumptions	65
5.3.2 Test and control variables	70
5.4 Empirical models for the corridor method	71
5.4.1 Model for the determinants of using the corridor method	72
5.4.2 Model for the non-compliance disclosure about corridor method.....	73
5.5 Empirical models for the effects of adopting the IAS 19R.....	75
6 EMPIRICAL RESULTS	80

6.1	Determinants and comparability of disclosures	80
6.1.1	Determinants of DAS.....	80
6.1.1.1	Univariate results.....	80
6.1.1.2	Regression results.....	83
6.1.2	Comparability of DAS.....	88
6.1.3	Additional tests.....	94
6.1.3.1	Culture effects.....	94
6.1.3.2	Company factors and change in disclosures ..	100
6.1.4	Summary of results.....	105
6.2	Determinants of corridor method users and compliance disclosure.....	106
6.2.1	Determinants of using the corridor method	106
6.2.1.1	Univariate results.....	107
6.2.1.2	Regression results	110
6.2.2	Determinants of compliance disclosure about the corridor method.....	114
6.2.2.1	Univariate results.....	114
6.2.2.2	Regression results	118
6.2.3	Additional tests.....	122
6.2.4	Summary	124
6.3	The effects of adopting the IAS 19R	124
6.3.1	Descriptive statistics of corridor method users and early adopters of IAS 19R.....	125
6.3.2	Regression results	127
6.3.3	Summary of results	148
6.4	Summary of the empirical results	148
6.4.1	The results of the examinations of DAS.....	149
6.4.2	The results of the examinations of the corridor method.....	150
6.4.3	The results of the effects of adopting the IAS 19R.....	151
7	CONCLUSION	153
7.1	Summary and implications of the study.....	153
7.2	Limitations.....	158
7.3	Suggestions for future research.....	158

Figures

Figure 1.	The key concepts of IAS 19R.....	8
------------------	----------------------------------	---

Tables

Table 1.	Comparison between disclosure requirements for actuarial assumptions under IAS 19 and IAS 19R.....	4
Table 2.	Sample selection	55
Table 3.	The industry distribution of the sample.....	58
Table 4.	The industry distribution of the sample among different countries	58
Table 5.	Re-classification of the industry distribution.....	59
Table 6.	Summary of Total assets, Operating revenue and Number of employees	60
Table 7.	Summary of Total assets, Operating revenue and Number of employees among different countries in the year of adopting IAS 19R.....	61
Table 8.	Summary of Total assets, Operating revenue and Number of employees among different industries in the year of adopting IAS 19R.....	63
Table 9.	The scoring role of each item of the actuarial assumptions - An example of the Discount rate	68
Table 10.	The assessment of the DAS - An example of Firm A.....	69
Table 11.	Descriptive statistics	81
Table 12.	The determinants on DAS, Text_D, Quanti_D and Sensiti_D.....	84
Table 13.	The robustness check for the determinants of DAS, Text_D, Quanti_D and Sensiti_D.....	86
Table 14.	Descriptive statistics	89
Table 15.	Regression results examining the comparability of DAS, Text_D, Quanti_D and Sensiti_D.....	90
Table 16.	The effect of IAS 19R on residual of comparability of DAS, Text_D Quanti_D and Sensiti_D.....	93
Table 17.	Descriptive statistics	96
Table 18.	The examination of culture effects on DAS, Text_D Quanti_D and Sensiti_D.....	97
Table 19.	The robustness check for culture effects on DAS, Text_D Quanti_D and Sensiti_D.....	99
Table 20.	Regression results examining the effects of analyst following on DAS, Text_D, Quanti_D and Sensiti_D after adopting the IAS 19R	101
Table 21.	Regression results examining the effects of foreign ownership on DAS, Text_D, Quanti_D and Sensiti_D after adopting the IAS 19R	102
Table 22.	Regression results examining the effects of pension funded status on DAS, DAS, Text_D, Quanti_D and Sensiti_D after adopting the IAS 19R.....	104
Table 23.	The distribution of corridor method users among different countries	107
Table 24.	The distribution of corridor method users among different industries	108
Table 25.	The descriptive statistics of cultural effects on the use of the corridor method.....	108

Table 26.	Descriptive statistics	109
Table 27.	Determinants of using the corridor method.....	111
Table 28.	Robustness check for determinants of using the corridor method.....	113
Table 29.	Relationship between compliance disclosure and corridor method users	115
Table 30.	The distribution of compliance disclosure of corridor method users among different countries	116
Table 31.	The distribution of compliance disclosure of corridor method users among different industries	116
Table 32.	Descriptive statistics	117
Table 33.	The determinants of compliance disclosure about corridor method.....	118
Table 34.	The robustness check for determinants of compliance disclosure about corridor method	121
Table 35.	The descriptive statistics of the relationship between DAS and Compliance_D.....	123
Table 36.	The association between DAS and Compliance_D	123
Table 37.	The descriptive statistics.....	125
Table 38.	The distribution of early adopters by country.....	126
Table 39.	The distribution of early adopters of the IAS 19R among industries	127
Table 40.	The determinants of discount rate.....	128
Table 41.	The robustness check for the determinants of discount rate	130
Table 42.	The determinants of dividend payables	132
Table 43.	The robustness check for the determinants of dividend payables	134
Table 44.	Comparison of leverage under IAS 19 and IAS 19R	137
Table 45.	The determinants of leverage.....	140
Table 46.	The robustness check for the determinants of leverage	142
Table 47.	The determinants of early adoption of the IAS 19R.....	144
Table 48.	The robustness check for determinants of early adoption of the IAS 19R.....	146
Table 49.	Summary of hypotheses and results of this study.....	156

Abbreviations

DAS	The disclosure level of actuarial assumptions
EU	European Union
FASB	Financial Accounting Standards Board
IAS	International Accounting Standards Board
IASB	International Accounting Standards Board
IASC	International Accounting Standards Board
IFRS	International Financial Reporting Standards

1 INTRODUCTION

This doctoral dissertation is written as a monograph and studies the application of the pension accounting standard IAS 19R. The IAS 19R was issued in 2011 and applied for annual reporting beginning on or after January 2013. This dissertation specifically focuses on the changes introduced in the IAS 19R over the previous standard IAS 19 that was issued in 2004. Studying the IAS 19R is important for several reasons. First, firms that follow accounting standards issued by the International Accounting Standard Board (IASB) have to report pension information according to the IAS 19R. The IASB is one of the most influential accounting standards boards in the world, and a large number of countries (e.g. those in the European Union) including 144 jurisdictions employed the accounting standards (i.e. the International Accounting Standards (IAS) and International Financial Reporting Standards (IFRS)) issued by it. Thus, the IFRSs/IASs are considered to be influential and studies of applications of IFRSs/IASs are required.

Second, the regulations for recognizing pension-related liabilities, assets and costs can always cause controversy (Glaum 2009). For example, the corridor method, which has been removed under the IAS 19R, caused considerable debate. The proponents argue that the corridor method can help in smoothing the pension liabilities by conditionally recognizing actuarial gains and losses off-balance sheet, while the opponents claim that the corridor method may mislead users of financial reporting.

Third, the pension accounting affects the employee benefit cost disclosed in the income statements and thereby influences reported earnings. Moreover, since the IAS 19R removes the corridor method and requires the immediate recognition of actuarial gains and losses in other comprehensive income and transferred in retained earnings, the IAS 19R also affects the equity in the balance sheet. For instance, Scandinavian Airlines System (SAS) dramatically decreased their shareholders' equity after adopting the IAS 19R: their interim report on January 31, 2014 shows that the removal of the corridor method led to a negative impact of 7.8 million on the group's shareholder equity.

Studies in pension accounting, however, are limited and especially on the application of the IAS 19R. To the best of my knowledge, only the following studies are related to the IAS 19R. Chircop and Kiosse (2015) investigate the preparer's position to the two changes under the IAS 19R (i.e. the removal of the corridor method and the net interest approach (i.e. a method which replaces the expected rate of return by discount rate)), finding that preparers tend to oppose the removal

of the corridor method when they face the unrecognized actuarial losses. Moreover, the preparers are found to be more likely to disagree with the net interest approach when the difference between the discount rate and expected rate of return is significant. Furthermore, Olivieri and Fersini (2014) provides a background basis to show the methods of calculating the interest cost step by step. Consequently, it is more akin to an interpretation of a specific calculation method under the IAS 19R. In addition, three articles (i.e. Yu 2014, Anantharaman and Chuk 2018 and Barthelme et al. 2019) have studied the market reaction to the IAS 19R. Yu (2014) investigates the market reaction to the key event days¹ of IAS 19R, and finds that the adoption of the IAS 19R significantly increases debt contracting costs while reducing firms' abnormal returns. Moreover, Anantharaman and Chuk (2018) examine the net interest approach under the IAS 19R by comparing a matched sample of 125 Canadian firms (i.e. which use the IAS 19) and 125 US firms (which use the US GAAP). Here, the authors find that firms' risk-taking in pension investment has been markedly reduced after adopting the IAS 19R. Furthermore, Barthelme et al. (2019) examine the effects of changing accounting standards on investment decision and using the setting of IAS 19R, with their results indicating that the investors tend to change their pension investment decision after the adoption of the IAS 19R. Specifically, Glaum et al. (2018) also examine discretionally accounting choices but under the IAS 19, finding that the determinant of using the equity method² in 2005 is the short-term effect on equity (i.e. the actuarial gains and losses that would be recognized in equity in the following year). They further find that the earnings before interest and tax have a significant influence on the accounting choice on interest cost and expected return on assets.

In contrast to the studies above (Chircop and Kiosse's 2015; Olivieri and Fersini 2014; Yu 2014, Anantharaman and Chuk 2018; Barthelme et al. 2019; Glaum et al. 2018), this dissertation focuses on the discretion changes in pension accounting standards and uses the setting of the IAS 19R. More specifically, two important changes under the IAS 19R are examined: a) the removal of the corridor method (i.e. a method used to recognize actuarial gains and losses), and b) the different

¹ There are eight key event days related to the IAS 19R: "On May 24, 2006, the IASB considered a proposal from the staff to consult the Standards Advisory Council (SAC) and the International Accounting Standards Committee (IASC) Foundation Trustees on adding a project on post-employment benefits to its technical agenda (Event 1)," "The IASB agreed unanimously to add the project to its agenda on July 18, 2006 (Event 2)," "On March 27, 2008, the IASB published comments for the Discussion Paper: Preliminary Views on Amendments to IAS 19 Employee Benefits (Event 3)," "On November 19, 2008, staff noted that most respondents to the discussion paper supported the recognition of all changes in the defined benefit obligations and in plan assets (Event 4)," "On November 17, 2009, the IASB reaffirmed its decision to eliminate the deferred recognition option in IAS 19 (Event 5)," "The IASB published the Exposure Draft: Defined Benefit Plans on April 29, 2010 (Event 6)," "The near final draft of amendments to IAS 19 was released to IASB website subscribers on June 2, 2011 (Event 7)," "the IASB published the amended IAS 19 Employee Benefits on June 16, 2011 (Event 8)" (Yu 2014).

² One of the accounting choices under IAS 19 requires the immediate recognition of the actuarial gains and losses in other comprehensive income and which will be transferred to retained earnings, and the IAS 19R requires firms use this method to recognize actuarial gains and losses.

disclosure requirements (i.e. from mandatory disclosure to significant disclosure) of the actuarial assumptions. The corridor method is a method to recognize the actuarial gains and losses under the IAS 19 which allows firms to conditionally delay the recognition of actuarial gains and losses, and it has been abolished under the IAS 19R. The disclosure requirements of actuarial assumptions under the IAS 19R allow firms to disclose “significant” information and give direction to define what is significant; while the IAS 19 requires mandatory disclosures. Thus, the IAS 19R gives firms more discretion in disclosing the actuarial assumptions but removes the discretion in recognizing the actuarial gains and losses. Two of the three important changes under the IAS 19R relate to the discretionary accounting choices, one has been employed (i.e. the disclosure requirements of actuarial assumptions) but the other has been removed (i.e. the corridor method). This dissertation will explain the reasons for the two changes. Moreover, the application of the IAS 19R concerning the two discretionary accounting choices will be presented.

1.1 Research questions

One of the main changes from the IAS 19 to IAS 19R is the different requirements for disclosing the actuarial assumptions. As can be seen from Table 1: under the IAS 19, firms are required to disclose the given principal actuarial assumptions (i.e. the discount rate, the expected rates of return, the expected rates of salary increase, medical cost trend rates and any other material actuarial assumptions used), and every actuarial assumption is required to be disclosed in absolute terms (i.e. 5%, rather than 2%-10%) (IAS 19: para. 120A (n)); while the IAS 19R sets the objectives of the disclosures (IAS 19, para. 212-214) and requires the disclosure of the significant actuarial assumption based on firms’ views. Thus, firms have discretion on the disclosure of actuarial assumptions. In addition, the IAS 19 demands the sensitivity analysis of medical costs (IAS 19, para. 120A (O)); while the IAS 19R requires entities to disclose the sensitivity analysis for each significant actuarial assumption (IAS 19R: para. 145). According to Ernst & Young (2011, pp. 11), this approach is considered as the disclosure mode from “mandatory” to “significant”.

In addition, the rule-based accounting standards provide detailed guidelines for application, while the principle-based accounting standards have clear objectives but lack the detailed guidelines. Thus, it seems that the disclosure requirements of actuarial assumptions under the IAS 19 are more rule-based, while those under the IAS 19R are more principle-based. Even though the general trend of accounting standards is principle-based, Sunder (2009) claims that little evidence shows that principle-based accounting standards improve the financial reporting quality.

Therefore, based on the above discussions, I formulate my first research question as: Do more principle-based accounting rules improve the disclosure level of financial reporting compared to more rule-based accounting standards? More specifically, *Does the application of the IAS 19R improve the disclosure level of financial reporting compared with the IAS 19?*

Table 1. Comparison between disclosure requirements for actuarial assumptions under IAS 19 and IAS 19R

Disclosure requirements for actuarial assumptions	IAS 19	IAS 19R
Disclosure content	Listed actuarial assumptions (IAS 19: para. 120A (n)) in absolute terms (i.e. discount rate, expected rate of return, salary increase and medical cost)	Significant actuarial assumptions
Sensitivity disclosure	Medical cost	Significant actuarial assumptions

The other change which will be examined is the removal of the corridor method. The removal of the corridor method abolished the previously allowed off-balance sheet disclosure of actuarial gains and losses and requires the immediate recognition of actuarial gains and losses. The actuarial gains and losses constitute the net defined benefit liability which is recognized in the balance sheet. Moreover, the net defined benefit liability represents the pension situation of an entity and influences the financial situation (i.e. liabilities) of the entity (IAS 19R: para. 57, 2013). Hence, not only the management of firms, but also the investors, may be influenced by the removal of the corridor method. However, the corridor method is one of the choices in recognizing the actuarial gains and losses³. Thus, as an initial step, I investigate the reasons for using the corridor method rather than any other method. Therefore, I formulate my second research question as: *What are the determinants of using the corridor method?*

³ There are three methods to recognize actuarial gains and losses before the IAS 19R: the immediate recognition of actuarial gains and losses in other comprehensive income which is transferred into retained earnings, the immediate recognition of actuarial gains and losses in profit or loss and the corridor method.

Furthermore, I will examine: *What are the effects of removing the corridor method under IAS 19R?* More specifically, the corridor method users' reaction to the adoption of the IAS 19R will be examined.

This dissertation employs a sample of 200 listed firms, with 50 each from Germany, France, Italy and Sweden, as European firms have adopted the IFRSs since 2005 and the listed firms are considered to be the ones that have normal annual reports. All of data are collected from the Orbis database and the pension-related data (e.g. information about actuarial assumptions) are hand-collected from the annual reports of the 200 firms in the year they adopted the IAS 19R and one year previously. The sample selection process is described in detail in Chapter 5.

Several statistical methods are employed in this dissertation. The logit regression method is used when examining the early adopters of the IAS 19R, the ordinary least squares (OLS) method is used to investigate the determinants of disclosure level of actuarial gains and losses (DAS) and the difference in difference method has been applied in testing the effects of adopting the IAS 19R on corridor method users. Moreover, the comparability of DAS has been measured in three alternative ways: the standard deviation, the ordered logistic regression and the tests of residuals. All of the empirical results are presented in Chapter 6.

1.2 Main findings, contribution, and structure of the study

The main empirical findings of this dissertation are as follows: First, it is found that the adoption of the IAS 19R leads to a higher disclosure level of actuarial assumptions (DAS) but reduces the comparability of DAS. Since the decreased comparability of DAS may be due to the first-year use of the IAS 19R, the application of the IAS 19R in the disclosures is supported by this study.

Second, the results suggest that a high amount of actuarial gains and losses increases firms' choices of using the corridor method. As the corridor method allows deferred recognition of actuarial gains and losses, it can be used to "smooth" firms' earnings. Hence, it is found that firms with more actuarial gains and losses tend to use the corridor method.

Third, the findings suggest that the (previous) users of the corridor method increased their leverage when they use the IAS 19R in the first year (i.e. 2011, 2012 or 2013). However, in the long run (i.e. 3 years before and 3 years after the

adopting time of IAS 19R, altogether 8 years from 2008-2015), their level of leverage did not change significantly.

This dissertation contributes to the IAS 19R literature by investigating two main changes under the IAS 19R in application: the significant disclosure requirements of actuarial assumptions and the removal of the corridor method. Even though there are studies on the IAS 19R (e.g. Olivieri and Fersini 2014; Yu 2014; Glaum et al. 2018; Chircop and Kiosse, 2015; Anantharaman and Chuk 2018 and Barthelme et al. 2019), none of these studies examine the disclosure level of actuarial assumptions and the corridor method users' reaction to the removal of the corridor method to examine the discretionary accounting choices.

Moreover, this dissertation advances the studies on the disclosure of pension assumptions (e.g. Fried and Davis-Friday 2013) through the comprehensive analysis of DAS. More specifically, this study investigates DAS based on the definition of actuarial assumptions under the IAS 19 (para. 73) and IAS 19R (para. 76). Furthermore, the examination of textual analysis of actuarial assumptions, quantitative disclosure of actuarial assumptions and sensitivity disclosure of actuarial assumptions are included. However, previous studies (e.g. Bauman and Shaw 2014) only focus on the disclosure of sensitivity analyses.

This dissertation extends the studies of discretionary in accounting choices by responding to the call of Glaum et al. (2018). More specifically, this dissertation investigates firms' behavior as a response to the removal of the corridor method and determines the economic consequences of removing the corridor method: firms' profitability is positively affected by the abolishment of the corridor method.

In addition, this dissertation advances the studies on compliance disclosures (e.g. Street and Bryant 2000) by examining whether firms retrospectively apply the IAS 19R and have comparative disclosure about the corridor method, which to the best of my knowledge has not previously been studied.

The remainder of this dissertation is structured as follows: Chapter 2 introduces the institutional background of the IAS 19R, which not only describes the main content of the IAS 19R and the important changes from the IAS 19 to the IAS 19R, but also reviews the development of pension accounting standards.

Chapter 3 consists of the literature review; it begins with previous literature on pension accounting to form a general opinion about studies in this field. Following this, the recent studies on the IAS 19R are presented. Finally, studies related to the research questions (i.e. studies of actuarial assumptions and studies about the corridor method) are presented.

Chapter 4 develops the hypotheses for this dissertation based on chapter 2 and chapter 3. Moreover, this chapter will be divided into three sections, with each section focusing on one research question (i.e. the relationship between DAS and IAS 19R, the determinants of using the corridor method and the effects of adopting the IAS 19R) and forms hypotheses for the research question.

Chapter 5 presents the data collection and research design. This chapter begins with a sample selection of the study. The second section presents a descriptive analysis of the data. The following sections build empirical models for the three research questions (i.e. DAS, the corridor method and the effects of adopting the IAS 19R) separately.

Chapter 6 shows the empirical results of this dissertation. This chapter includes examinations for hypotheses and additional tests (e.g. the culture effects on DAS) that present the application of the IAS 19R.

Chapter 7 reviews the previous chapters and summarizes the empirical results. Moreover, the implications of findings are discussed in this chapter. Furthermore, the limitations of this study as well as suggestions for future studies are presented.

2 INSTITUTIONAL BACKGROUND

This chapter presents the institutional background of the dissertation. It begins with an overview of key concepts of the IAS 19R and IAS 19⁴. Furthermore, the development of pension accounting standards issued by the IFRS is presented. Following this, the IAS 19R is introduced from its process of adoption to its main changes.

2.1 An overview of key concepts under IAS 19R Employee Benefits

This section reviews the key concepts of the IAS 19R that are related to the research questions of this dissertation. More specifically, the concepts about the disclosure requirements of actuarial gains and losses (DAS) and the removal of corridor method will be presented.

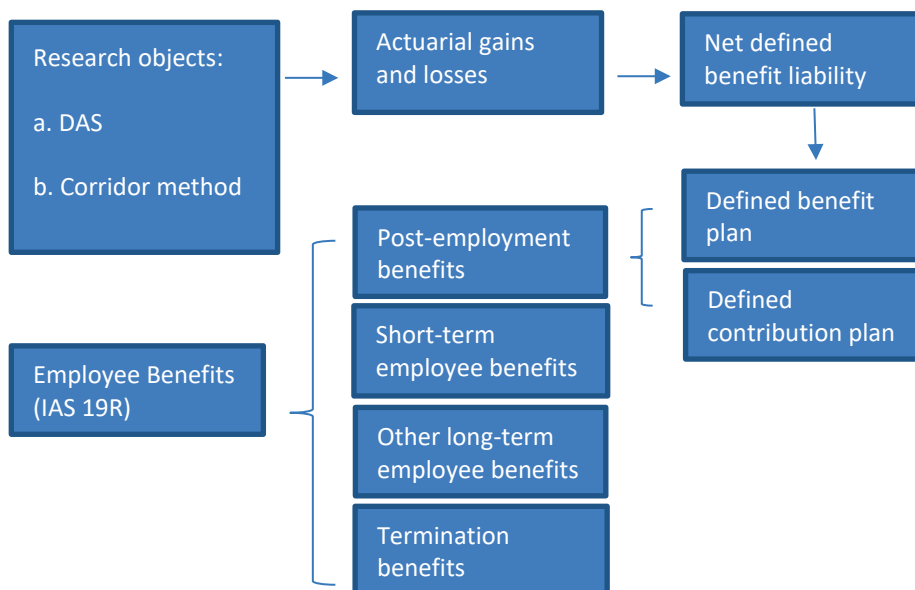


Figure 1. The key concepts of IAS 19R

Figure 1 shows the key concepts of the IAS 19R and the association between the IAS 19R and the research objectives of this dissertation. The IAS 19R regulates the accounting for short- and long-term employee benefits, termination benefits and post-employment benefits. Pensions are a form of post-employment benefit and the post-employment benefits are provided by post-employment benefit plans.

⁴ In this dissertation, the IAS 19R is the version issued in 2011; while the IAS 19 is the predecessor of the IAS 19R which has been issued in 2004.

Moreover, the post-employment benefit plans are classified as defined benefit plans and defined contribution plans. Furthermore, the defined benefit plans are required to determine the net defined benefit liability (IAS 19R, IN6 (g)), and the actuarial gains and losses are an important constituent when determining the remeasurements of the net defined benefit liability (IAS 19R: para. 57). Finally, both of the two research objectives (i.e. DAS and the corridor method) affect the actuarial gains and losses: on the one hand, the actuarial gains and losses⁵ are calculated based on the actuarial assumptions, while on the other, the corridor method is used to recognize the actuarial gains and losses. Thus, I will introduce the concepts under the IAS 19R according to Figure 1.

Employee Benefits

According to the IFRS (IAS 19R: para. IN1), the IAS 19R Employee Benefits rules “the accounting and disclosure by employers for employee benefits”. The IAS 19R requires an entity to recognize:

“(a) a liability when an employee has provided service in exchange for employee benefits to be paid in the future; and

(b) an expense when the entity consumes the economic benefit arising from service provided by an employee in exchange for employee benefits” (IAS 19R: para. 1).

Moreover, employee benefits are “*all forms of consideration given by an entity in exchange for service rendered by employees or for the termination of employment*” (IAS 19R: para. 8) and have been identified as including four parts: the short-term employee benefits, the post-employment benefits, the other long-term employee benefits, and termination benefits. This study will only focus on the post-employment benefits.

Post-employment benefits

Post-employment benefits are “*employee benefits (other than termination benefits and short-term employee benefits) that are payable after the completion of employment*” (IAS 19R: para. 8).

⁵ The actuarial gains and losses have been introduced as “*changes in the present value of the defined benefit obligation resulting from: experience adjustments (the effects of differences between the previous actuarial assumptions on what has actually occurred); and the effects of changes in actuarial assumptions*” (IAS 19R, para. 8, 2013).

Moreover, when an entity provides post-employment benefits for employees with a formal or informal arrangement, it is called post-employment benefit plans (IAS 19R: para. 8). The post-employment benefit plan is composed of the defined benefit plan and the defined contribution plan.

Defined benefit plans and Defined contribution plans

The definitions of the two plans show their close relationship. The defined benefit plans are “post-employment benefit plans other than defined contribution plans”, while the defined contribution plans are “*post-employment benefit plans under which an entity pays fixed contributions into a separate entity (a fund) and will have no legal or constructive obligation to pay further contributions if the fund does not hold sufficient assets to pay all employee benefits relating to employee service in the current and prior periods*” (IAS 19R: para. 8).

Although the defined contribution plans arrange the entity’s fund for employees, the amount of the fund under the defined contribution plan is determined by the entity’s (or the employee’s) willingness (IAS 19R: para. 28). Furthermore, employees will undertake the potential risk (i.e. the actuarial risk and investment risk) under the defined contribution plans. However, the defined benefit plans arrange the agreed benefits to employees and the entity will undertake the potential risk (i.e. the actuarial risk and investment risk) (IAS 19R: para. 28). Hence, compared to the defined contribution plans, the defined benefit plans are more reliable and stable to employees.

Net defined benefit liability

The net defined benefit liability (asset), which “*adjusted for any effect of limiting a net defined benefit asset to the asset ceiling*”⁶ (IAS 19R: para. 8), has been defined as the deficit or surplus of defined benefit plans. Moreover, the defined benefit liability (asset) equals the present value of pension obligation less the fair value of plan assets (IAS 19R: para. 8). In addition, the pension obligation is the obligation due to current and prior employee service, while the plan assets include “*assets held by a long-term employee benefit fund; and qualifying insurance policies*” (IAS 19R: para. 8).

⁶ The asset ceiling is the “*present value of any economic benefits available in the form of refunds from the plan or reductions in future contributions to the plan*” (IAS 19R, para. 8, 2013).

According to the accounting for defined benefit plan that has been stated in steps in para. 57 of IAS 19, the defined benefit liability is used to adjust for “*any effect of limiting a net defined benefit asset to the asset ceiling*” (IAS 19R: para. 8). Moreover, as the net defined benefit liability (asset) is required to be recognized in the statement of financial position (IAS 19R: para. 63), it affects an entity’s financial situation immediately and attracts more attention than other pension items that are not presented on the balance sheet.

Actuarial gains and losses, the corridor method and the actuarial assumptions

In the last step of the accounting for defined benefit plans, the remeasurement of the net defined benefit liability (asset) is required to be disclosed in other comprehensive income, which comprises: actuarial gains and losses, return on plan assets and changes in the effect of asset ceiling (IAS 19R: para. 57).

The actuarial gains and losses are defined as “*changes in the present value of the defined benefit obligation resulting from: experience adjustments (the effects of differences between the previous actuarial assumptions on what has actually occurred); and the effects of changes in actuarial assumptions*” (IAS 19R: para. 8).

Thus, the remeasurement of the net defined benefit liability includes the actuarial gains and losses, which are based on the actuarial assumptions.

Actuarial assumptions

The actuarial assumptions are defined as “*an entity’s best estimates of the variables that will determine the ultimate cost of providing post-employment benefits.*” (IAS 19R: para. 76). More specifically, the actuarial assumptions are used to measure the defined benefit obligation and pension expense and may also be used in assessing the actuarial gains and losses (IAS 19R: para. 55). Furthermore, it contains two parts: the demographic assumptions (e.g. mortality) and the financial assumptions (e.g. discount rate), and the two parts are required to be disclosed separately (IAS 19R: para. 76).

Thus, the actuarial assumptions are a set of variables that decide the amount of post-employment benefits which will finally result in the amounts recognized in the income statement and balance sheet. Moreover, the changes in actuarial

assumptions are via net defined benefit liability (asset) and disclosed in other comprehensive income. For example, the net defined benefit liability (asset) is required to be recognized in the balance sheet (IAS 19R: para. 63), and one of the financial assumptions: the discount rate is used to calculate it⁷. Hence, the changes of the discount rate will change the amount of net defined benefit liability (asset); meanwhile, the changed amount will be recognized in other comprehensive income. In addition, the net interest on the net defined benefit liability, which is recognized in the profit or loss (i.e. an important constituent of the income statement), is measured as the net defined benefit liability (asset) multiplying the discount rate (i.e. one of the actuarial assumptions under the financial assumptions).

As a result, both the income statement and the statement of the financial position will be affected by the actuarial assumptions. Thus, in terms of financial reporting the actuarial assumptions are highly important, and the disclosure level of actuarial assumptions (i.e. DAS) is an important research object of this dissertation.

Corridor method

The corridor method is one of the options⁸ introduced under the IAS 19 which was used to recognize the actuarial gains and losses (i.e. the changes in net defined benefit liability/asset). It means actuarial gains and losses can be disclosed off-balance sheet when the net accumulated unrecognized actuarial gains and losses is within the “(a) 10% of the present value of the defined benefit obligation at that date (before deducting plan assets); and (b) 10% of the fair value of any plan assets at that date. These limits should be calculated and applied separately for each” (IAS 19: para. 92, 38, 2010).

The “real” amount of actuarial gains and losses, and net pension liability (assets), with all detailed explanations (e.g. which method of recognizing the actuarial gains and losses was chosen, what is the amount of actuarial gains and losses with the other method), were disclosed off-balance sheet (i.e. in the notes to the financial statements). Thus, the use of the corridor method may mislead the readers of the financial reporting, as it obscures the firm’s financial situation. For example, a firm

⁷ The defined benefit liability (asset) is the deficit or surplus, which equals the present value of the defined benefit obligation less the fair value of the plan asset (IAS 19R, para. 8, 2013); while the discount rate (i.e. one of the actuarial assumptions) is used to calculate the defined benefit obligation (IAS 19R, para. 83, 2013).

⁸ The IAS 19 (IAS 19R, para. BC 66, 2013) offered three options to recognize the actuarial gains and losses: the corridor method, the immediate recognition in profit or loss, and the immediate recognition in other comprehensive income and transferred to retained earnings (i.e. the equity method). Both immediate recognition in profit or loss and immediate recognition in other comprehensive income are known as full recognition.

may choose to delay the recognition of actuarial losses and present a net pension asset in the balance sheet while the plan is in deficit (IAS 19R: para. BC 70).

2.2 The development of pension accounting standards issued by IASB

This section presents the pension accounting standards issued by the IASB that relate to the IAS 19R. By reviewing the predecessors of the IAS 19R, the development of the pension accounting regimes under the IASB as well as the motivations of publishing the IAS 19R can be seen.

The IASB issued the following pension accounting standards and related studies: E16 (1980); IAS 19 (1983); E47 (1992); IAS 19 (1993); E54 (1996); IAS 19 (1998); second version IAS 19 (2000); third version IAS 19 (2004); and IAS 19R (since 2011). However, according to the IASB (IAS 19R: para. BC2), only the standards that have been issued since the E54⁹ are related to the IAS 19R, thus only the regimes since the IAS 19 (1998) will be reviewed.

2.2.1 Pre- IAS 19R (2011)

There are three pension accounting standards issued before the IAS 19R (2011) and related to it: the IAS 19 (1998), the IAS 19 (2000) and the IAS 19 (2004). This section will focus on the IAS 19 (1998); the other two standards are closely related to the IAS 19R, thus they will be presented together with the IAS 19R.

IAS 19 (1998)

The International Accounting Standards Committee (IASC) issued IAS 19 Employee Benefits in 1998 based on Exposure Draft 54 (E54). It allowed the delayed recognition of actuarial gains and losses of the post-employment benefits when the net accumulated unrecognized actuarial gains and losses are within the corridor¹⁰ (i.e. the corridor method). This regime is a formal rudiment of the IAS 19R which includes the detailed definition of employee benefits, the components of employee benefits and the measurement of each component that constitutes the

⁹ The E54 is was published by the IASC in 1996, which is the basis of the IAS 19 that was issued in 1998. However, it is the exposure draft rather than a standard, hence it will not be presented.

¹⁰ "(a) 10% of the present value of the defined benefit obligation at that date (before deducting plan assets); and (b) 10% of the fair value of any plan assets at that date. These limits should be calculated and applied separately for each defined benefit plan" (IAS 19 para. 92)

employee benefits. Moreover, it requires the accrual basis to recognize employee benefits.

2.2.2 The IAS 19R (2011)

The IAS 19R came out in 2011 and is considered to be a milestone in the accomplishment of the accounting convergence between the IASB and FASB on post-employment benefit. This section will introduce the IAS 19R from its birth to its main changes/contents.

2.2.2.1 The exploration of the birth of the IAS 19R

This part will introduce the development history of pension accounting standards under the IASB, the reasons for issuing the IAS 19R, and the process of issuing the IAS 19R.

The development history of IAS 19R

The earliest document which related to the IAS 19R is the E54 Employee Benefit. It was issued in 1996 by the International Accounting Standards Committee (IASC, which is the predecessor of the IASB) which set the foundation for later pension accounting standards: the use of projected unit credit approach¹¹ and the assessment of pension obligation on every year-end date. Two years later, in 1998, the IASC revised the E54 and issued the IAS 19. Then, in October 2000, the IAS 19 was revised again, in which the definition of plan assets has been extended and the reimbursement has been introduced. Later, in 2004, the third revision came out, and this time the accounting for multi-employer plans¹² and group plans had been added. Finally, in 2011, the IAS 19R came out as a result of the joint program between the IASB and FASB, which removed the corridor method. Thus, the immediate recognition of actuarial gains and losses is required, which will influence the net defined benefit liability (asset) that is recognized on the balance sheet. Moreover, the IAS 19R makes different requirements for defined benefit

¹¹ According to the IFRS (IAS 19R, para. 68) “*The projected unit credit method (sometimes known as the accrued benefit method pro-rated on service or as the benefit/years of service method) sees each period of service as giving rise to an additional unit of benefit entitlement and measures each unit separately to build up the final obligation.*” Moreover, the projected unit credit method is used to “*determine the present value of its defined benefit obligation and the related current service cost and, where applicable, past service cost*” (IAS 19, para. 67)

¹² According to the IAS 19 (para. 32) “*An entity shall classify a multi-employer plan as a defined contribution plan or a defined benefit plan under terms of the plan (including any constructive obligation that goes beyond the formal terms).*”

plans and multi-employer plans (IAS 19R: para. BC2), under which the most relevant pension information to users of financial statements is focused upon more than ever before. More specifically, the characteristics of defined benefit plans, the influences of the defined benefit plans on the entity's future cash flows as well as the amount of defined benefit plans that are recognized in the financial statements are required to be clearly explained (IAS 19R: para. BC213). Furthermore, the IAS 19R introduces the net interest approach instead of the expected return approach when calculating the net interest on the net defined benefit liability (asset) (IAS 19R: para. BC74). Thus, the previously allowed different expected returns on plan assets and obligations are abolished; the IAS 19R requires the part of the expected return on plan assets that influence profit and loss to be calculated using the same interest rate (i.e. the discount rate) as for the liability.

The disclosure requirements for the multi-employer defined benefit plans are based on previous requirements under the IAS 19 but with additional disclosure¹³. Overall, the removal of the corridor method, the different disclosure requirements for defined benefit plans, and the multi-employer plans (IAS 19R: para. BC2) are the three main changes under the IAS 19R.

Based on the review of the pension accounting standards under the IFRS in the previous sections, the net defined benefit liability (asset) is the key point in improving the usefulness of pension information to the users of financial statements, because the net defined benefit liability (asset) is recognized on the balance sheet, which is more intuitive to the users of the employer's financial statements and immediately influences the entity's financial situation.

Moreover, two of the three main changes under the IAS 19R focus on the net defined benefit liability (asset): the removal of the corridor method, which eliminates the option to delay the recognition of changes in the net defined benefit liability (asset), and the different disclosure requirements for defined benefit plans, which changes the disclosure requirements of the components.

As a result, this dissertation studies the two main changes regarding the measurement (i.e. the removal of the corridor method) and disclosures (i.e. different disclosure requirements of defined benefit plans) of defined benefit liability (asset) to reveal if they have improved the usefulness of pension information in practice.

¹³ "(a) qualitative information about any agreed deficit or surplus allocation on wind-up of the plan, or the amount that is required to be paid on withdrawal of the entity from the plan. (b) the expected contribution for the next annual period. (c) the level of participation in a multi-employer plan." (IAS 19R, para. BC245).

The reasons for issuing the IAS 19R

Anecdotal evidence and academic research suggest that many users of financial statements did not fully understand the information that entities provided about post-employment benefits before the amendments made in 2011 (i.e. under IAS 19). For instance, the corridor method allowed the delayed recognition of the actuarial gains and losses if the net cumulative unrecognized actuarial gains and losses were within the ‘corridor’ (i.e., the greater of 10% of the defined benefit obligation and 10% of the fair value of any plan assets). Thus, it was assumed to significantly increase the misleading amounts in the financial position statement. This is because an entity might have recognized assets in the balance sheet, while in fact the entity was facing a deficit. In addition, the use of the corridor method might reduce the comparability and understandability of the financial reporting.

The process of issuing the IAS 19R

Following complaints from several parties, the IFRS made efforts to revise the new standard.¹⁴ In 2006, the IASB accepted the need to improve the accounting for post-employment benefit in the short term and put it on its agenda, in order to meet the requirement of higher-quality accounting information (IAS 19R: para. BC4).

Soon after, in 2008, the IASB released a discussion paper concerning the improvement of the accounting standards for the post-employment benefits, which is the ‘Preliminary Views on Amendments to IAS 19’. It identified three areas for discussion: “(a) *the deferred recognition of some gains and losses arising from defined benefit plans; (b) presentation of the changes in the net defined benefit liability or asset; (c) accounting for employee benefits that are based on contributions and a promised return and employee benefits with a ‘higher of option (contribution-based promises)’*” (IAS 19R: para. BC5-6). A total of 150 comment letters were received in response to the discussion paper. Based on these comments, the IASB decided to focus on the disclosure for defined benefit plans and multi-employer plans (IAS 19R: para. BC7). Later, in 2010, another exposure draft ‘Defined benefit plans’ had been published by the IASB, which not only received 227 response letters but also a wide range of opinions.¹⁵ The board replied

¹⁴ According to the IFRS (BC3, 2011) “Both users and preparers of financial statements criticized those accounting requirements for failing to provide high quality, transparent information about post-employment benefits.”

¹⁵ Four requirements can be concluded from the comment letters: 1. The accounting for employee benefits should be comprehensively reviewed; 2. A joint project between IASB and FASB on the pension accounting standards is

that the improvement of the whole standard might well take a long time to complete, while the accounting for employee benefits was in urgent need of improvement. Thus, the short-term project was undertaken (IAS 19R: para. BC8).

2.2.2.2 The main changes from IAS 19 to IAS 19R

This section will introduce three changes made in the IAS 19R: the different disclosure requirements for defined benefit plans, the removal of the corridor method, and the net interest approach.

The different disclosure requirements of actuarial assumptions

Actuarial assumptions are defined as “*an entity’s best estimates of the variables that will determine the ultimate cost of providing post-employment benefits*” (IAS 19R: para. 76). They are required to be “*unbiased and mutually compatible*” (IAS 19R: para. 75) and are considered to be the reason for the complex accounting for defined benefit obligation (IAS 19R: para. 55). Moreover, the changes of actuarial assumptions may result in actuarial gains and losses (IAS 19R: para. 128) which influence the remeasurements of net defined benefit liability (asset) (IAS 19R: para. 127). Hence, the disclosure of actuarial assumptions is significant to the net defined benefit liability (asset). Moreover, the improvement in the disclosure of the actuarial assumptions increases the level of understandability of the net defined benefit liability (asset) and further increases the usefulness to the users of the financial statements.

It is important that, under the IAS 19, the board (IAS 19: para. 120A (n)) required an entity to disclose the “*principal actuarial assumptions used as at the end of the reporting*” (e.g. the discount rates, the expected rates of return, medical cost trend rates). Moreover, the IAS 19 required the sensitivity disclosure of the medical cost trend rates (IAS 19: para. 120A (o)). Furthermore, entities were required to disclose the given principal actuarial assumptions (i.e. the discount rate, the expected rates of return, the expected rates of salary increase, medical cost trend rates and any other material actuarial assumptions used), and every actuarial assumption needed to be disclosed in absolute terms (i.e. 5%, rather than 2%-10%) (IAS 19: para. 120 A(o)).

suggested; 3. Some questioned the limited scope project of employee benefits; 4. The continuing changes on the pension accounting standards may cause disruption (IAS19R, Para. BC8-9).

However, under the IAS 19R, the objectives of the disclosures are given and the standard (IAS 19: para. 212-214) only requires the disclosure of the significant actuarial assumptions that are used to determine the present value of defined benefit obligation. In addition, the IAS 19R asks entities to disclose the sensitivity analysis for each significant actuarial assumption (IAS 19R: para. 145). Even though the IASB requires firms to disclose the significant actuarial assumptions, it does not give any guidelines for them. Hence, it is decided by companies which actuarial assumption is significant enough to be disclosed. The IASB stated following reasons for this change: “*because particular disclosures may not be needed in every case to meet the disclosure objectives. Indeed, such disclosures may obscure important information with excessive detail*” (IAS 19: para. 228).

The removal of the corridor method

The IAS 19R abolished the use of the corridor method and required the immediate recognition of actuarial gains and losses. There were three methods to recognize actuarial gains and losses before the adoption of IAS 19R: a) the corridor method, b) the immediate recognition of profit or loss, c) immediate recognition in other comprehensive income and transferred to retained earnings, which is also known as the equity method (IAS 19R: para. BC66). Moreover, the latter two methods are also known as full recognition of actuarial gains and losses. As the actuarial gains and losses constitute the net defined benefit liability (asset), the measurement of actuarial gains and losses is important to the recognition of net defined benefit liability (IAS 19R: para. 57).

The removal of the corridor method aims to solve the “*deferred recognition of some gains and losses arising from defined benefit plans*” (IAS 19R: para. BC5-6). The corridor method allows the deferred recognition of actuarial gains and losses if the net cumulative unrecognized actuarial gains and losses were within the ‘corridor’ (i.e. the greater of 10% of the defined benefit obligation and 10% of the fair value of any plan assets). Although the corridor method helps firms to smooth their financial reporting by adjusting the actuarial gains and losses, it makes financial reporting hard to understand and less comparable. Thus, the removal of the corridor method improves the relevance, faithful representation, understandability and comparability of the pension information (IAS 19R: para. BC70-71). More specifically, it results in a more appropriate recognition of net defined benefit liability (asset).

The employment of the net interest approach

The net interest approach requires firms to use the discount rate (i.e. the discount rate that is employed to calculate the defined benefit obligation) instead of the expected rate of return in calculating their net interest on the net defined benefit liability. According to the IFRS (IAS 19R: para. 8) “*Net interest on the net defined benefit liability (asset) is the change during the period in the net defined benefit liability (asset) that arises from the passage of the time*”. The appearance of the net interest approach is considered to be one of the material changes under the IAS 19R for the purpose of improving the “*presentation of the changes in the net defined benefit liability or asset*” (i.e. one of the areas mentioned in the discussion paper ‘Preliminary Views on Amendments to IAS 19’ (IAS 19R: para. BC5-6).

The net interest on the net defined benefit liability is calculated by combining the finance cost of defined benefit obligation and plan assets (IAS 19R: para. BC76). However, under the IAS 19, the finance cost of the defined benefit obligation is measured based on the discount rate and the expected rate of return. According to the board (IAS 19R: para. BC87), using the expected rate of return to assess the finance cost of plan asset is not objective as it may include returns that are caused by issues other than the passage of time. Moreover, it is harder to determine the expected return in practice than the discount rate (IAS 19R: para. BC83b). In addition, the use of the expected rate of return means reporting firms’ expected performance rather than their actual performance (IAS 19R: para. BC83).

The net interest approach, however, employs the discount rate to calculate the net interest on the net defined benefit liability (asset) (i.e. finance cost). This approach is considered to be more understandable and relevant by unifying the calculating basis of the finance cost/income of both defined benefit obligation and plan asset. Moreover, this unification also made a simple and practical presentation in the balance sheet (IAS 19R: para. BC76, BC81). In addition, it faithfully presents an entity’s economics of decision on financing a plan. For example, facing a high-risk investment, rather than separately recognizing an estimated high return in profit or loss and high risk in other comprehensive income, both the high risk and return have been recognized as other comprehensive income (IAS 19R: para. BC81, BC83). Furthermore, compared with the expected rate of return, the discount rate is more objective (IAS 19R: para. BC83).

Other important changes about the disclosures of defined benefit plans

The IAS 19R also made material changes on the disclosure requirements of defined benefit plans, the characteristics of defined benefit plans, the sensitivity disclosure requirements of actuarial assumptions, the recognition of the defined benefit cost, and the disclosure of amount, timing and uncertainty of future cash flows.

In general, the IAS 19R improves the usefulness of disclosed pension information and requires the disclosure of defined benefit plans as follows:

“(a) explains the characteristics of the defined benefit plans.

(b) identifies and explains the amounts in the financial statements arising from the defined benefit plans.

(c) describes how involvement in defined benefit plans affects the amount, timing and uncertainty of the entity’s future cash flows” (IAS 19R: para. BC213).

In order to clarify the characteristics of defined benefit plans, the standard requires:

“(a) additional information about exposure to risk;

(b) distinguishing between actuarial gains and losses arising from demographic and financial assumptions;

(c) not requiring an entity to distinguish between plan amendments, curtailments and settlements if they occur together;

(d) stating a principle for the disaggregation of plan assets rather than listing the categories required; and

(e) stating a principle for the disclosure of significant actuarial assumptions rather than listing the assumptions required to be disclosed” (IAS 19R: para. BC215).

The standard further makes sensitivity disclosure requirements of actuarial assumptions:

“An entity shall disclose:

(a) sensitivity analysis for each significant actuarial assumption as of the end of the reporting period, showing how the defined benefit obligation would have been affected by changes in the relevant actuarial assumption that were reasonably possible at that date;

(b) the methods and assumptions used in preparing the sensitivity analyses required by (a) and the limitations of those methods;

(c) changes from the previous period in the methods and assumptions used in preparing the sensitivity analyses, and the reasons for such changes” (IAS 19R: para. 145).

Moreover, this standard offers guidelines concerning the recognition of the defined benefit cost which is recognized on the balance sheet. In the board’s view, the defined benefit cost comprises:

“(a) service cost, relating to the cost of the services received, in profit or loss;

(b) net interest on the net defined benefit liability (asset), representing the financing effect of paying for the benefits in advance or in arrears, in profit or loss;

(c) remeasurements, representing the period-to-period fluctuations in the amounts of defined benefit obligations and plan assets, in other comprehensive income” (IAS 19R: para. BC65).

In addition, the disclosures concern the amount, timing and uncertainty of future cash flows which have been improved in terms of:

“(a) information about asset-liability matching strategies;

(b) sensitivity analysis; and

(c) information about the funding and duration of the liability” (IAS 19R: para. BC229).

2.3 Summary

This chapter introduces IAS 19R. It begins by presenting the key concepts of IAS 19R to offer a general view of the IAS 19R. Then, it shows the development of pension regimes under IASB, which can be divided into two parts: the pre-IAS 19R regimes and IAS 19R. It can be seen that all of the regimes have the same foundation (i.e. the general objectives, the definition of important components, the structure of the employee benefits) that has been built up since the E54. From E54 to the IAS 19R, most changes are made on measurement and disclosures of the net defined benefit liability (asset), because it not only shows the pension obligation of an entity but is also recognized in the statement of financial position. Thus, it influences the financial situation of an entity, which is significant to the users of financial reporting.

Concerning the section of IAS 19R, it presents the origins of IAS 19R and the main changes under IAS 19R. More specifically, the removal of the corridor method, the different disclosure requirements of the defined benefit plans and the net interest approach are introduced. All of them are core topics that had been discussed in the ‘*Preliminary Views on Amendments to IAS 19*’ and ‘*Defined Benefit Plans (2010 ED)*’. The comments for the two discussion papers are wide ranging, and include not only academics but also “*the users and preparers of the financial statements, regulators and others interested in the financial reporting of employee benefits from a variety of geographic areas*” (IAS 19R: para. BC8). The changes made by IAS 19R are well thought out, because they show the pension accounting regimes’ developing trend and the expectations of the board. However, whether the IAS 19R will improve the usefulness of financial reporting is still unknown. This dissertation will address this question by examining the application of IAS 19R.

3 THEORETICAL BACKGROUND

This chapter can be divided into four parts: the first part reviews studies on pension accounting to show popular topics in the pension accounting field; the second part presents research on IAS 19R; the third part focuses on the studies of my first research objective: the DAS (i.e. which begins with the studies of disclosures, then further introduces the studies about pension disclosure and ends with the studies on the value relevance of recognition versus disclosure); and the fourth part focuses on the studies of my second research objective: the corridor method (which contains studies of the determinants of adopting a pension accounting standard and the articles about the economic consequences of adopting a pension accounting standard).

3.1 Studies on pension accounting

There are two main streams of empirical studies in the field of pension accounting; one is value-relevance studies, the other is earnings management studies (Glaum 2009).

The value-relevance studies highlight the important role of investors and examine the decision-usefulness of the disclosed pension information (Glaum 2009). According to Barth et al. (2001), the tight relationship between investors' expectations and stock market valuation contributes to the sustained focus on the value-relevance research. Many studies (Barth et al. 1992; Carroll and Niehaus 1998; Cardinale 2007; Hann et al. 2007; Bauman and Shaw 2014) find that the pension information is useful for investors' decision making. For example, Barth et al. (1992) and Hann et al. (2007) state that pension cost components significantly affect stock prices. Furthermore, Carroll and Niehaus (1998) and Cardinale (2007) claim that the pension information can be used to explain bond ratings. However, Holthausen and Watts (2001) and Beaver (2002) point out that the value-relevance studies are indirect studies of the decision-usefulness, because the value-relevance studies only focus on the relationship between the pension information and the share price but ignore the investors' reaction to the pension information. Moreover, as the associations between the pension information and the share price are examined during a specific period, the changes in the share price can also be attributed to other information (Beaver 2002). Even though many scholars (e.g. Dhaliwal 1986; Barth et al. 1993) find that the amount of pension plan is as important as other corporate assets or liabilities, whether pension information affects share price is still unknown (Beaver 2002).

The earnings management studies primarily focus on the actuarial assumptions (Glaum 2009). The actuarial assumptions are used to determine the post-employment obligations. Thus, the changes of the actuarial assumptions lead to changes in the balance sheet and the firm's financial position. For example, Godwin et al. (1996) find that firms use the changes in actuarial assumptions (e.g. wage growth, employee turnover) to manage earnings.

3.2 Studies on IAS 19R

Following section 3.1 (i.e. the studies on pension accounting), this section further introduces the studies on the pension accounting standard: IAS 19R.

There are two main types of research in this field, one (i.e. Yu 2014) studying the investors' reactions to the IAS 19R, while the other one (i.e. Glaum et al. 2018; Chircop and Kiosse 2015; Barthelme et al. 2019; Anantharaman and Chuk 2018; Hsu et al. 2013) is focused on the firms' behavior as a response to the IAS 19R.

Yu (2014) examines the market reaction to the IAS 19R. More specifically, the study lists all the key event days that relate to the IAS 19R, and collect the data of the daily returns around the event days (i.e. one day before to one day after the event days) in order to find out: a). "*the market reaction to the key events of the IAS 19R*" (P.734); b). "*the influences of the key events on stock prices*" (p.735); and c). "*the relationship between company characteristics and the stock price reaction around the events*" (p.735). The study employs a sample of 401 firms from European countries and the data cover the period from 2006 to 2011. The results show that the employment of IAS 19R increases debt contracting cost and reduces abnormal returns. In addition, the firms with higher leverage, lower ratios of net periodic pension cost to net income and smaller firm size are more likely to be influenced by IAS 19R (i.e. more likely to have lower abnormal returns). However, firms that seldom use the corridor method and firms from countries with weaker credit rights are less influenced by the adoption of the IAS 19R. Overall, the article implies that "*the disclosure is not a substitute for recognition, since recognition of previously disclosed items affects debt contracting costs*" (Yu 2014). However, the limited data (i.e. a sample of 401 firms are included) and missing variables (e.g. changes in the disclosure requirements) are its limitation.

Studies of the IAS 19R focus on the management's attitudes and reaction to the IAS 19R. Before the formal version of IAS 19R was issued, Chircop and Kiosse (2015) examine the preparer's position to the removal of the corridor method and the employment of the net interest approach (i.e. to use the discount rate instead of the expected rate of return when calculating the net interest on net defined

benefit liability) on the 2010 Exposure Draft ‘Employee Benefits’¹⁶. They employ 54 firms that submitted comment letters to the Exposure Draft “*Employee Benefits*” as the submitter group and 1348 firms from the US, UK, Germany, Switzerland, India, Canada and France as the control group. The authors find that when facing unrecognized actuarial losses, the preparers oppose the removal of the corridor method. However, when the differences between the discount rate and expected rate of return are large, the firms are less likely to be proponents of the net interest approach. Thus, firms’ attitude to the accounting methods depends on their own situation.

Moreover, Glaum et al. (2018) investigate the firms’ choices of the discretion in accounting, using 3207 firm-year observations from listed firms in France, Germany and the UK during 2005 to 2013. They focus on the accounting choices under the IAS 19; more specifically, the accounting choices of defined benefit pension plans (i.e. the determinants of early adopters of the equity method¹⁷ and the determinants of the disclosing place of the net pension interest cost¹⁸). Their study shows that firms’ financial situation and strategies decide their accounting choices on pensions. Moreover, since the discretionary pension accounting choices reduce the comparability, the authors oppose them.

Anantharaman and Chuk (2018) investigate whether the application of the net interest approach (see section 2.3.2.2) affects firms’ decisions on taking part in transactions. The authors use a matched sample, which includes 125 Canadian firms as the treatment sample and 125 US firms as the control sample. They further use a difference in difference research design and compare Canadian firms that have been influenced by the IAS 19R to the American firms that have not been influenced by the IAS 19R. Their results show that the adoption of the net interest approach reduces firms’ risk-taking in pension investments.

Barthelme et al. (2019) examine the effects of accounting standards on firms’ pension investment decisions, using the risk and return profiles and the allocation of pension assets as the classifying criteria. More specifically, the authors employ matched samples (i.e. treatment firms and control firms) with 216 firm-year observations during the period from 2010 to 2013 to investigate the effects of removing the corridor method on the firms’ pension investment decisions. Their

¹⁶ The Exposure Draft Employee Benefits is an exposure draft issued by the IASB in 2010 and was intended to generate proposals about the revision of the IAS 19, which includes the removal of the corridor method and net interest approach under IAS 19R.

¹⁷ The equity method is one of the choices under the IAS 19 for recognizing the actuarial gains and losses, which requires the immediate recognition of the actuarial gains and losses in other comprehensive income and transferred to retained earnings, while there is another option: the corridor method, which allows conditional deferred recognition of the actuarial gains and losses.

¹⁸ The option to recognize the net pension cost in either operating income or financial income.

results show that the removal of the corridor method shifts firms' pension asset from equity to bonds.

The articles above are studies of the IAS 19R, and most of them study the economic consequences of adopting the IAS 19R by investigating the management's/ investors' reaction to the removal of the corridor method and the adoption of the net interest approach. However, those studies do not consider the very important issue present under the IAS 19R: the different disclosure requirements of actuarial assumptions. This dissertation will meet this gap by examining the disclosure level of actuarial assumptions before and after the adoption of the IAS 19R. Moreover, the determinants of using the corridor method, the compliance disclosures about the corridor method and the corridor method users' reaction to the adoption of IAS 19R will also be investigated.

3.3 Studies on the disclosure level of actuarial assumptions

This part presents the literature related to the disclosure level of actuarial assumptions. In order to obtain a holistic view of this topic, I begin by reviewing the studies of disclosures, and then the studies of pension disclosure, and, finally, the studies on value relevance of recognition versus disclosure.

3.3.1 Studies on disclosures

Financial reporting is considered to be a significant instrument for capital market participants (e.g. investors, debtors) to understand the company's situation (e.g. the financial position, objects, strategies). Thus, the disclosure of financial reporting is required to be useful to users (e.g. investors, lenders) in making the entity-related decisions (IASB 2013: para. OB2). Hence, the level of disclosure affects the users' decisions, which means high-quality disclosures may help users to make better decisions compared with low-quality disclosures. As a result, it has been suggested that better disclosures can reduce the information asymmetry among management and investors (Healy and Palepu 2001; Glaum et al. 2013). The reduction of the information asymmetry can encourage more investors to join the capital market. Thus, the reduction of the information asymmetry may increase the liquidity of shares, decrease the volatility and finally decrease the cost of capital. Hence, a higher level of disclosure is positively related to the liquidity of the firms' shares (Healy and Wahlen 1999; Leuz et al. 2000; Glaum et al. 2013) and negatively related to the cost of capital (Botosan 1997; Botosan and Plumlee 2002; Glaum et al. 2013). Nevertheless, the disclosure has its drawbacks and the

most obvious one is the cost of disclosure. From generating the information, managing the information to publishing the information, the cost of disclosures is accumulated. Moreover, during the process of generating information, the proprietary cost of disclosure could also increase the disclosure cost. For example, the disclosure of proprietary information to competitors in the product market could be costly (Beyer et al. 2010). Beyer et al. (2010) claim that the proprietary cost of disclosure may prevent full disclosure. Furthermore, information can be recognized in the balance sheet or income statement, or disclosed in the notes to the financial statements. Users of financial statements may pay less attention to disclosed information. To explore this issue, Miller and Skinner (2015) study the difference between the disclosure and recognition of fair values with 245 firms from European countries. They find that the equity price is more sensitive to recognized information than the disclosed information about fair values of investment property. More importantly, they claim that the differences between disclosure and recognition are primarily due to the information processing cost and the fair value reliability. Thus, the capital market participants are suggested to spend more time on the disclosed information. In addition, the possibility of litigation may also impact upon the indirect disclosure cost. The management may decide to disclose more information in order to reduce the risk of litigation (Skinner 1993). Hence, the companies with strong corporate governance tend to have higher disclosure quality.

3.3.2 Studies on pension disclosures

Beyer et al. (2010) claim that the firms' voluntarily disclosure of all their private information is the unraveling result, and the unraveling result holds only if the following six conditions are met: *"(1) disclosures are costless; (2) investors know that firms have, in fact, private information; (3) all investors interpret the firms' disclosure in the same way and firms know how investors will interpret that disclosure; (4) managers want to maximize their firms' share prices; (5) firms can credibly disclose their private information; and (6) firms cannot commit ex-ante to a specific disclosure policy"*.

All of the six conditions work together to create the unraveling result. In other words, the unraveling results only occur when the managers have strong incentives to change investors' underestimates of the firm value (i.e. due to the investors' reasonable inference that managers hide most information). In contrast, the lack of even one condition will not result in full disclosure. More specifically, the following conditions will prevent the voluntary disclosure:

Investors are unaware of the hiding of private information:

Pae (2002) suggests that firms withhold bad news as investors cannot distinguish them from firms that do not have information. Thus, managers are more likely to disclose good news and withhold bad news, as they have incentives to attract more investments by creating a higher firm value.

Investors' uncertain response to the disclosures:

The investors' different levels of sophistication cause their different responses to disclosures (Beyer et al. 2010). The managers' expectations on the investors' response to disclosures decide the firms' disclosures. Thus, the uncertain investors' response is a sufficient reason for withholding information by managers (Suijs 2007).

Managers' uncertain response to the disclosures:

Managers may have different incentives under different situations. For example, managers maximize stock price to attract more investors, while managers minimize stock prices when the stock options are awarded (Aboody and Kaznik 2000). As a result, when investors find managers have uncertain incentives, they will assess firms at a weighted average level on their disclosures, and thus prevent the full disclosures (Einhorn 2007).

The non-verifiable disclosure:

Beyer et al. (2010) claim that there are some informal communication channels where information is shared but firms do not need to tell the truth. Furthermore, when the misreporting is costly, it is believed that the high price is due to the managers' incentive to increase the firm value and the difference between managers' private information and bias information disclosed. Thus, managers are rather hiding their private information than misreporting information (Beyer et al. 2000).

Firms commit ex-ante to a disclosure policy:

When firms commit a policy ex-ante, then managers are more likely to withhold private information. According to Dye (2001), the ex-ante full disclosures decrease the firms' profit, because when the market demand is high, the uninformed companies can have more output.

Costly disclosure:

Concerning the cost of disclosure, the proprietary information is one of the main reasons (e.g. holding a conference) resulting in costly disclosure. Moreover, managers will only disclose information when it is 'sufficiently favorable' (Lanen and Verrecchia 1987). Otherwise, even the lack of disclosure may cause investors' inferences that firms are hiding bad news and they will further underestimate the firm value. Managers will not disclose sufficient unfavorable information in order to have higher payoffs by reducing the disclosure costs, which prevents full disclosure (Beyer et al. 2010).

Verrecchia (1983) creates the proprietary cost theory, which indicates that the increase in proprietary cost and the appearance of 'worse news' has a negative influence on the disclosure quantity. The proprietary theory is a fundamental theory that has been used in later pension disclosure studies. For example, Scott (1994) investigates the incentives for managers to voluntarily disclose pension information by examining the influences of proprietary cost and information cost savings¹⁹. After investigating 288 Canadian firms from 1987 to 1988, the results²⁰ indicate that the labor-related proprietary cost negatively affected the pension disclosure amount, while favorable news increased the pension disclosure. In addition, Klumpes (2000) studies the managers' incentives for voluntary disclosure of the pension information after the pension legislation was enacted, and before the related accounting standards were put into use. More specifically, the author focuses on the influences of proprietary cost (which uses the investment risk and funding ratio as proxies) and political cost (which uses size as proxy) on the voluntarily disclosure. By employing 119 Australian companies and 100 UK firms, it is found that both the proprietary cost and the political cost have implications for voluntary disclosures.

After the FASB No. 87 (i.e. a pension accounting standard issued by the Financial Accounting Standards Board in 1985) came out, the pension disclosure studies tended to focus on the investors' reaction to the pension information. Landsman and Ohlson (1990) examine the influences of the off-balance sheet pension information on the stock price during 1979 to 1982, finding that the market underreacted to the pension information that had been disclosed off-balance sheet. Furthermore, Lode and Yusof (2015) examine 70 firms from Malaysia which followed the Malaysian Financial Reporting Standard No. 19 Employee Benefits,

¹⁹ The "information cost savings" theory is used by Diamond (1985) to explain the voluntary disclosure; he suggests that the information cost savings positively influences the voluntary disclosure.

²⁰ The article also has results for the information cost savings; the results show a positive relationship between the firm size and the information cost savings, but the relationship between the information cost savings and voluntary disclosures is equivocal.

and their results indicate that the higher disclosure of pension liabilities leads to more cumulative market adjusted return.

Additionally, Harper et al. (1987) examine the US pension accounting standards: FASB No. 87 using an experimental research design. More specifically, the authors investigate the disclosure requirement which demands companies to disclose the pension liability in the balance sheet by conducting an experiment that included 51 bankers with an average of 6.2 years' experience and 82 undergraduate accounting students. Their results indicate that the users of accounting reports treat the information on the balance sheet and off-balance sheet differently, especially for those who are less sophisticated (i.e. undergraduate accounting students).

Another stream of pension disclosure studies pays attention to the factors which affect the pension disclosure. For example, by examining a sample of 150 firms that have disclosed pension information (i.e. in the footnotes) in their financial statements under the setting of the SFAS No. 87 in 1986 and 1987, Gopalakrishnan and Sugrue (1992) claim that leverage and pension plan funding are the determinants of the accounting choices on the actuarial assumptions. Moreover, Byrne et al. (2013) examine the determinants of actuarial assumptions using the setting of pension accounting standard: FRS-17 (i.e. a pension accounting standard employed in the UK and issued by the Accounting Standards Board in 2001). After examining a sample of 876 firm-year data from 2001 to 2004, the authors find that the firm size and leverage have a significantly negative influence on the disclosure of pension assumptions.

3.3.3 Studies on value relevance of recognition versus disclosure

The removal of the corridor method, which is one of the research objectives in this dissertation, affects the recognition of actuarial gains and losses. As stated earlier, the corridor method users are allowed to conditionally disclose the actuarial gains and losses off-balance sheet. However, the removal of the corridor method requires firms to immediately recognize the amount of actuarial gains and losses in other comprehensive income. As a result, the removal of the corridor method leads to the change from disclosure to recognition on actuarial gains and losses for corridor method users. This section reviews studies on value relevance of recognition versus disclosure.

The debate on the comparison between the recognition and disclosure is heated and has lasted for a considerable length of time. This is not only because it matters

to the way that firms prepare their financial reporting and influences the investors' assessment of firms, but also that it affects investors' decisions.

The definitions for recognition and disclosure have been explained in the Statement of Financial Accounting Concepts No. 5²¹, according to which, "Recognition is the process of formally recording or incorporating an item in the financial statements of an entity as an asset, liability, revenue, expense, or the like. Recognition includes depiction of an item in both words and numbers, with the amount included in the totals of financial statements" (SFAC No. 5 para.6). Meanwhile, the disclosure is explained as not meeting the requirements of recognition but providing supplementary information for most useful items of financial statements (e.g. assets, liabilities) by notes or other means of financial reporting (SFAC No. 5 para. 9).

Furthermore, there are studies investigating factors moderating the differences between recognition and disclosures. Picconi (2006) investigates whether the disclosed pension information can be fully processed by investors when they are making decisions (e.g. make earnings forecasts). They examine 51,451 firm-year observations from 1988-2001 when the SFAS No. 87 was applied. The authors find that investors fail to fully process the disclosed information but can completely process the recognized pension information. Thus, the results indicate that investors have difficulties in understanding the footnote disclosures in an accurate way, and their misunderstandings lead to the differences in the value relevance of recognition versus disclosure.

Emett and Nelson (2017) examine whether investors still follow accounting changes in the periods subsequent to the changes. They use the setting of pension accounting and focus on the recognition of actuarial gains and losses. They apply a "3*5 mixed-design experiment", and use 142 MBA and undergraduate students who have previously learnt accounting and finance as the sample. Their results show that in the subsequent periods to the accounting changes, investors who only receive the reconciliation disclosures in the period of change gradually converge to those who did not receive any disclosures, but diverge to those who receive disclosures all the time concerning their valuation judgement. The results indicate that "investors gradually forget to adjust for the accounting change over time under the current approach use to disclose accounting changes" (Emett and Nelson 2007). Thus, it supports the idea that disclosure is different from recognition.

²¹ SFAC No.5, which is an accounting standard issued by FASB in 1984 and named: Recognition and Measurement in Financial Statements of Business Enterprises.

Moreover, Yu (2013) investigates the influential factors of the value relevance between disclosure and recognition. Specifically, the author focuses on whether the institutional ownership and analyst following have effects on the value relevance of disclosure versus recognition under the environment of accounting changes from SFAS No. 87 (i.e. disclosure) to SFAS No. 158 (i.e. recognition). With the analysis of a sample including 991 entities from 1999 to 2007, he finds that the institutional ownership and the analyst following have a significantly positive influence on the investors' valuation between recognition and disclosure. However, the recognition reduces the positive effects of institutional ownership and analyst following on the value relevance more than disclosure.

A possible reason why recognized items are more value relevant than disclosed items is that recognition is associated with higher reliability (e.g. Ahmed et al. 2006). Ahmed et al. (2006) examine investors' reaction to the disclosure versus recognition with the setting of SFAS No. 133 (i.e. a standard issued by the FASB in 1998 to deal with the accounting for derivative instruments and hedging activities). They employ 146 bank holding firms as sample, and collect data during the period from 1995 to 2000. Their results show that investors valued the disclosed information quite differently from the recognized information, and the recognized information is considered to be more reliable.

Moreover, Libby et al. (2006) run two experiments with 44 Big Four audit partners as the sample to examine the auditors' reactions to the disclosures and recognition. Their results show that auditors have more tolerance of the mistakes made in disclosure than in recognition, as the recognition is considered to be more reliable to them.

In addition, Davis-Friday et al. (1999) examine the market reaction to the recognized information versus disclosed information under the SFAS No. 106 (i.e. pension accounting standards issued by the FASB in 1990). A sample of 229 firms is used in investigating the two kinds of information. Moreover, by comparing the effects of recognized information and disclosed information on stock prices, the results indicate that the market pays more attention to the recognized information than the disclosed information concerning the liability of retirement benefits other than pensions.

Additionally, Davis-Friday et al. (2004) compare the market reaction to the disclosure with the recognition under the accounting change (i.e. the SFAS NO. 106 replaced the SAB No. 74) which is the switch from a disclosure environment to a recognition environment. In addition, the liabilities for retirement benefits other than pensions are employed as the research object. Moreover, a sample of 199 firms during 1991 to 1993 is used. The results show that the recognized

amounts are considered to be more reliable than the disclosed information concerning the market reaction.

However, some studies suggest that there is no difference between recognition and disclosure. For example, Dhaliwal (1986) examines whether the not recognized unfunded vested pension obligations are taken into account as debt when assessing the firm risk by the capital market participant. After examining 55 firms during 1976 to 1979 with a model that links firms' systemic risk to their financial risk and business risk, the results show that the market views the pension liability as debt. Thus, the study supports the opinion that the disclosure information is as same as the recognized information. This study technically examines whether the disclosed unfunded vested pension obligations are considered as debt when estimating the firm risk, but ignores the investors' different levels of sophistication. Moreover, as the author does not give enough information about the firm size and the amount of unfunded vested pension obligations, the influences of the unfunded pension obligations on the firm risk could be somewhat small. Furthermore, according to the author the model is incomplete and he does not consider the unfunded unvested pension obligations. All of these deficiencies could be a strong point to doubt the author's findings.

To conclude, scholars have used different methods with different samples under different accounting settings to study this topic. Some of them believe that they are equal (i.e. Dhaliwal 1986), while others think the recognition is more useful and reliable than disclosures (e.g. Libby et al. 2006). Furthermore, there are studies explaining the factors which cause the differences (e.g. Picconi 2006). It can be inferred from the studies that, except for the different levels of reliability, the different cognitive levels of the users of financial statements (e.g. Emmett and Nelson 2017) and the influences of analyst following (Yu 2013), are the factors causing the differences between the value relevance of disclosure and recognition.

3.4 The use of discretion in pension accounting for earnings

This section presents studies on discretionary accounting choices. Since this dissertation examines the discretionary choices under pension accounting standard IAS 19R (2011 version), most of the studies included in this section examine the determinants of accounting methods and use the setting of pension accounting standards.

The accounting choices increase the flex level of accounting, and, according to Fields et al. (2001), "*the implications of accounting choices to achieve a goal are*

consistent with the idea of earnings management". Thus, managers can make different accounting choices to "manage" earnings, while scholars (e.g. Fields et al. 2001) in turn study the accounting choices to reveal managers' different incentives (i.e. they may have incentives to increase or decrease the stock price), which may relate to firms' financial situation and strategy.

Moreover, the employment of an accounting choice can be informative; firms with different financial situations in different sizes from different industries may choose different accounting choices. For example, firms from a specific industry need to choose the accounting method that is suitable for their efficient contracting perspective (Holthausen 1990).

Fields et al. (2001) further identify three types of studies on the accounting choices that are based on three market imperfections and further affect managers' choices: the agency costs (which generally relate to contractual issues), the information asymmetries (which study the relationship between managers and investors) and externalities affecting non-contracting parties (the third party contractual and non-contractual relations). This section will only discuss the studies of pension accounting choices, and, more specifically, the studies on determinants of discretion in pension accounting choices.

Many accounting standards allow for discretion in accounting and disclosure. For example, the IAS 19R requires firms to disclose significant actuarial assumptions but does not define what significant means. Thus, it leaves discretion in disclosing significant actuarial assumptions. Another example is the IAS 19 (2004 version), which gives discretion in the accounting for recognizing actuarial gains and losses (i.e. the corridor method). Hence, firms can have their preference when making choices. In the meantime, the corporate information (e.g. financial situation) can be revealed: Wu et al. (2016) claim that the accounting choice is of special interest because it can clarify the firms' real type (i.e. the level of credit risk, profitability and the abnormal stock returns). Their study shows that firm type is the determinant of adopting the fair value option for liabilities under SFAS No. 159 (i.e. an accounting standard concerning the options to recognize assets and liabilities with their fair value).

Fasshauer, Glaum and Street (2008) analyze 481 companies' annual reports in 2005 from 20 European stock exchanges with a specific tool²². They find that many European firms get off-balance sheet financing with the corridor method and most European listed companies adopt the corridor method. Their results indicate that

²² The authors developed the "IAS 19 Tool" in Microsoft and it is used to collect the information disclosed by companies under IAS 19.

the factors affecting the use of the corridor method are: industry field, cross-country variation, the firm's financial situation and its strategy.²³ In addition, they find that using the full recognition (i.e. the immediate recognition) of actuarial gains or losses rather than the corridor method results in an increase in the pension liability and a decrease in the shareholders' equity. Finally, the authors suggested that the IASB remove the corridor method.

Stadler (2010) chooses a sample of 163 listed companies in the German Stock Exchange from 1998 to 2006 to investigate the German companies' choices for pension accounting. The results show that companies prefer to use higher pension discount rates if they adopt the corridor method and their actuarial losses are close to but do not exceed the corridor. But companies choose a lower pension discount rate when the market yield is increased. Moreover, companies prefer to adopt the outside profit or loss method²⁴ to recognize actuarial gains and losses when their profit or loss exceeds the corridor. Thus, the study finds firms tend to choose different accounting methods based on their own financial situation.

Morais (2010) studies the determinants of choosing the methods to recognize the actuarial gains and losses under the IAS 19 (2004 version), which enables both the corridor method (i.e. a method which enables deferred recognition of actuarial gains and losses) and full recognition (i.e. a method which requires immediate recognition of actuarial gains and losses). After analyzing a sample of 91 European listed companies from 2005 to 2007 through the reviewing of financial statements and building a logit model, the study finds that the determinants of choosing the accounting method for actuarial gains and losses are: size, industry, profitability and the existence of actuarial gains and losses.

Furthermore, Lode and Naiper (2014) examine the determinants for management to exercise discretion in recognizing the actuarial gains and losses under the IAS 19 (version 2004) which allows both the corridor method and full recognition. With the analysis of pension notes in the financial statements from 2005 to 2007 among UK firms, the authors find that both firm size and interest coverage have a positive influence on choosing a less volatile method (i.e. the corridor method) of recognizing the actuarial gains and losses.

Additionally, Bauman and Shaw (2014) examine the determinants of disclosure of pension assumptions of randomly selected 147 companies that have relatively large amounts of defined benefit pension plans. They find that a company with a bigger

²³ According to Fasshauer et al. (2008) "Some companies may select the new IAS 19 option to protect future earnings".

²⁴ The outside profit or loss method is an option given by the IAS 19 (2004 version) to recognize actuarial gains and losses and it required full actuarial gains or loss to be recognized in equity

firm size, employing a 'Big Four' audit firm, and having a higher variability level of operations, tends to have more pension disclosures; while a company with a better funded status and/or in the field of regulated industries has less pension disclosures.

To conclude, although studies in this field may investigate different subjects and find various factors that influence the choices of adopting a specific accounting method, their results show one thing in common: firms tend to choose different accounting methods based on their own financial situation (e.g. profitability) and strategy. Moreover, the broad environment such as region-cross differences, politicians, and culture (Fasshauer et al. 2008) also have an influence on the firms' accounting choices.

3.5 Studies about the economic consequences of adopting pension accounting standards

This section reviews studies that are related to the third research question: the effects of adopting the IAS 19R. More specifically, the influences of employing an accounting standard (e.g. Gopalakrishnan and Sugrue 1992) and the effects of different levels of disclosure on market (e.g. Vergauwe and Gaeremynck 2018) are presented.

The following studies have focused on the economic consequences of adopting pension accounting standards. Khurana and Loudder (1994) studied the economic consequences of the SFAS 106 (i.e. a pension accounting standard issued by the Financial Accounting Standards Board in 1990). Using a sample of 113 firms that are rate-regulated public utility firms, the authors find that the market reaction to a new issued standard varies among regions based on different economic environments (i.e. the market's ex-ante expectation to the regulators' action), and the investors did not assess the proposed standard as a value-decreasing event on average.

Moreover, Basu and Naughton (2016) investigate the economic consequences of changing accounting standards. More specifically, the authors examine the sensitivity of corporate credit ratings to the requirement change from disclosure to recognition under SFAS No. 158 (i.e. a pension accounting standard issued by the Financial Accounting Standards Board in 2006). Employing a sample of 447 firms and the quantitative adjustment method, the results show that the credit ratings are influenced by the accounting changes. More specifically, compared to firms that report pension liability in the footnotes, the firms that recognize larger

pension liability after the adoption of SFAS No. 158 obtain comparable higher corporate credit ratings.

Chuk (2013) investigates whether firms change their behavior to the accounting changes on financial statement disclosures. More specifically, this study focuses on the firms' behavior as a response to the accounting changes and uses the setting of SFAS No. 132R (i.e. a pension accounting standard issued by FASB in 2003 which requires the disclosure of pension asset composition). By analyzing US firms, the author claims that firms change their behavior as a response to the adoption of SFAS No. 132R. More specifically, firms that used to overestimate the expected rate of return increase their asset allocation to high-risk securities or reduce their assumptions of expected rate of return.

Furthermore, Fried and Davis-Friday (2013) examine the economic consequences of the adoption of SFAS No. 158 (i.e. a pension accounting standard issued by the Financial Accounting Standards Board in 2006). More specifically, this study focuses on the management's reaction to the requirement of recognizing post-retirement benefit obligations (which used to be disclosed only under SFAS No. 158). Thus, it investigates the economic consequences of the approach from disclosure to recognition of the post-retirement benefit obligation. The authors further employ 994 firms as the sample with 3617 firm-year observations during 2003-2007. The results show that management makes adjustments to the accounting assumptions as a response to the change from disclosure to recognition. Thus, managers increase the discount rate to reduce the influence of the adoption of the SFAS No. 158, especially for the firms with larger obligations and volatile pension assets.

Sasaki (2017) investigates the management's reaction to the discretion in pension reporting. More specifically, the author examines whether managers use the discretion in pension accruals (i.e. choosing a higher discount rate or expected rate of return) to mitigate the influences of costly research and development investment. By employing a sample of listed Japanese firms from the Tokyo Stock Exchange during 2001-2011, the author suggests that firms tend to use a higher discount rate to reduce the effects of increased research and development expenditures on earnings. Thus, the discretion in reporting pension accruals can be used to manage earnings.

To conclude, it is unsurprising to find that the adoption of a new accounting standard/choice affects the behaviors of market participants (e.g. management). The new requirement from disclosure to recognition (e.g. Fried and Davis-Friday 2013) or even the more detailed disclosure requirement (e.g. Chuk 2013) under pension accounting standards affect the management behavior and market's

reaction (e.g. the adjustment of accounting assumptions). Thus, the small changes on the requirement of disclosures in pension accounting standards could have a significant influence on the market. Moreover, studies on the accounting changes benefit standard setters and users of financial statements by showing the implications and influences of the accounting standard.

4 HYPOTHESES DEVELOPMENT

This chapter describes the development of hypotheses that are used to examine the three research questions: Does the IAS 19R improve the disclosure level of actuarial assumptions (DAS); What are the determinants of using the corridor method; and What are the influences of adopting the IAS 19R. The first two research questions deal with the disclosure (i.e. the disclosure of actuarial assumptions) and measurement (i.e. the determinants of adopting the corridor method) of the net defined benefit liability, while the third research question is based on the first two research questions to reveal the influences of adopting the IAS 19R (i.e. to examine the influences on DAS and on removing the corridor method). Thus, the first two research questions are the basis for the third research question and they work together to analyze the influences of adopting IAS 19R.

4.1 The disclosure level of actuarial assumptions

The IAS 19R requires entities to disclose only significant actuarial assumptions, while the IAS 19 demands the mandatory disclosure of actuarial assumptions and issue detailed guidelines. Thus, the significant disclosure offers more space for entities to decide the amount of disclosures (IASB 2013: para. 76).

According to Ernst & Young (2011: pp.13), *“It is unclear whether there will really be a difference in practice of disclosing actuarial assumption to ‘significant’ actuarial assumption. However, the move from a mandatory list could result in less disclosure for insignificant assumptions that are currently required under IAS 19”*. Thus, Ernst & Young support the significant disclosure for its reduction of insignificant assumptions while continue to have doubts on its application. However, KPMG (2011) tends to be more passive about the application of the significant disclosures: KPMG (2011: pp. 35) argues that the disclosure of the significant actuarial assumptions is a somewhat challenging task as firms not only need to assess the level of significance but also decide the way to present the information. Thus, KPMG strongly suggests an early plan in detail for the significant actuarial assumptions. Moreover, PWC (2013: pp. 22) reminds management that even though the significant disclosures are more extensive, the new disclosures may need both additional actuarial calculations and the internal reporting update. In contrast to the previous three audit firms, Deloitte (2011: pp. 42) offers guidelines for the significant actuarial assumptions. Moreover, it defines the significant actuarial assumptions as the discount rate, expected salary increase and the mortality, which is much less than the disclosure requirements of actuarial assumptions under IAS 19. Hence, the Big Four firms have different opinions

about whether significant disclosure requirements of actuarial assumptions would have an effect on financial reports.

Even though there is no research on the relationship between the IAS 19R and DAS, there are studies on the discretionary accounting choice. The disclosure requirements of actuarial assumptions under the IAS 19R offer discretionary accounting choices to firms to reveal significant actuarial assumptions. Glaum et al. (2018) claim that the discretionary accounting choices can be used to reveal different information for different firms and thus reduce the information asymmetry. Nevertheless, discretion can be used to manage earnings and reduce the comparability (Fields et al. 2001; Glaum et al. 2018).

In summary, the discretionary accounting choices can be used to reduce information asymmetry, to manage earnings and to ensure comparability. However, no research has so far studied the discretionary accounting choice specific to the DAS under IAS 19R. Moreover, even the Big Four firms doubt the effects of applying the IAS 19R on the DAS. Thus, I build the hypothesis in null-form:

H1: The adoption of IAS 19R has no effect on the disclosure level of actuarial assumptions.

Comparability is known as one of the qualitative characteristics that enhances the usefulness of information²⁵ (IASB 2013: para. QC19), which enables users to identify and understand similarities and differences among items (IASB 2013: para. QC21). Hence, scholars (e.g. Ball 2006) study comparability to examine the disclosure level. Moreover, some studies (e.g. Ball 2006) compare IFRS with national GAAP by examining the comparability. For example, Ball (2006) claims that even though the IFRS promotes the accounting convergence, whether it potentially increases the comparability is unknown. This is because the process of implementing the IFRS may be different between various regions due to the problems of language, culture, business and politics (Cascino and Gassen 2015; Lang et al. 2010). However, Yip and Young (2012) suggest that the adoption of IFRS improves the information comparability. Thus, the results of whether the adoption of IFRS increases the comparability are conflicting according to previous studies.

²⁵ Comparability, verifiability, timeliness and understandability are qualitative characteristics that enhance the usefulness of information that is relevant and faithfully represented (QC 19, 2013).

Since the IAS 19R requires significant disclosure, firms only need to disclose information that they consider to be significant. However, firms from a different country, different industry, different financial situation, different firm size and with different management may have different perceptions about what is “significant” in a specific situation. Thus, this significant disclosure requirement of actuarial assumptions may impede the comparability when comparing with the detailed guidelines under IAS 19 (i.e. which listing the requirement disclosures).

The detailed guidelines are alleged to improve and are intended to achieve comparability. However, Schipper (2003) doubts the appropriate “strict” level of guidelines: if the guidelines are too strict and contain unimportant requirements, they may increase the cost of disclosures while not improving the comparability. On the other hand, if the guidelines are not strict enough, they may not achieve the required comparability. Hence, the author claims that knowing the amount of comparability in financial reports and the clear relationship between the detailed guidelines and comparability (i.e. how many guidelines can achieve how much comparability) are the essential conditions to prove the detailed guidelines achieve comparability. Since there is no answer to the two essential conditions, there is no evidence to prove the advantage of detailed guidelines in improving comparability. Moreover, Glaum et al. (2018) study the discretionary accounting choices in the setting of IAS 19 and suggest that the discretion accounting choices decrease the comparability level.

To summarize, whether detailed guidelines achieve the desired level of comparability remains an open question (Schipper 2003). Discretionary accounting choices may impede comparability (Glaum et al. 2018), because it offers more choices to firms. Moreover, different firms have different choices. Thus, the significant disclosure requirements under IAS 19R, which is considered to be a discretionary accounting choice, may decrease the comparability of DAS. Hence, I form following the hypothesis:

H2: The adoption of IAS 19R impede the comparability of disclosure level of actuarial assumptions.

Analyst following plays an important role in capital markets and may therefore influence disclosures as well. However, the different roles of analysts lead to different effects of analyst following on disclosures. When defining the analysts as information providers, there is a negative relationship between the number of analysts and the number of disclosures (Lang and Lundholm 1996), because analysts compete with the firms which provide disclosures to investors. Under

these circumstances, more disclosures of firms may reduce the number of analysts, and, conversely, greater analyst following may reduce the amount of disclosures by the firm. Nevertheless, when considering analysts as information intermediaries, there is a positive relationship between analyst following and the number of disclosures (Lang and Lundholm 1996). Since analysts obtain information from companies and transfer information (which may include their analysis and forecasts) to the capital market, more disclosures by firms may lead to increased analyst following. Many studies support this opinion and claim that there is a positive relationship between analyst coverage and disclosure (Bhushan 1989; Lang and Lundholm 1996; Chang, Hooi and Wee 2014; Gao, Dong, Ni and Fu 2015). Moreover, Chang, Hooi and Wee (2014) point out that not all kinds of disclosure affect the analyst coverage and their forecasts, as they may only choose the information which they assessed to be important as their sole source for making forecasts.

Concerning the relationship between the disclosure level of pension information and analysts, there are studies (e.g. Picconi 2006) doubting whether the analysts fully reflect the pension information. For example, Picconi (2006) investigates the SFAS No. 87 (i.e. a pension accounting standard issued by the FASB in 1987 and put into use since 1988) and finds that analysts fail to reveal the changes on pension information immediately but they gradually reflect the changes in the subsequent period. Moreover, Yu (2013) studies US pension accounting standards (i.e. SFAS No. 87 and SFAS No. 158) and finds that the institutional ownership and analyst coverage have positive effects on the disclosure level of pension information.

The articles above claim that the different roles of analysts affect the relationship between analyst following and number of disclosures (Lang and Lundholm 1996). Even though scholars (Picconi 2006) may doubt the revealing level of pension information by analysts, it is found that the number of analysts affects the disclosure level of pension information (Yu 2013). As discussed, the actuarial assumptions included in the IAS 19R are used to calculate the defined benefit obligation, and they are made by the companies. Hence, the analysts can only obtain the information on actuarial assumptions from firms as information intermediaries. Thus, concerning the actuarial assumptions, there is a positive relationship between analyst following and the disclosure level of actuarial assumptions. More specifically, the more a firm discloses its actuarial assumptions, the more analysts will be able to analyze them and transfer the related information to investors. Hence, I form my third hypothesis as:

H3: There is a positive relationship between analyst following and the disclosure level of actuarial assumptions.

Foreign ownership is known to be an important factor influencing disclosures and the influence of foreign ownership has been studied by many scholars (Singhvi 1968; Haniffa and Cooke 2002; Xiao and Yuan 2007; Dhoubi and Mamoghli 2013). Their results, without exception, suggest that there is a relationship between the foreign ownership and the disclosure level. Since foreign investors face a higher level of information asymmetry than domestic investors considering the institutional and legal barriers (Oxelheim and Randoy 2003), companies with more foreign ownership have to disclose more information in order to meet their needs. In addition, many researchers (e.g. Mangena and Tauringana 2007; Bokpin and Isshaq 2009) have found that foreign investors intend to invest in the companies that disclose more than others. Hence, it is not surprising to find that foreign ownership is positively associated with the amount of disclosure. For example, Singhvi (1986) finds a relationship between the proportion of foreign ownership and the disclosure of a corporate report.²⁶ Moreover, Haniffa and Cooke (2002) claim that foreign ownership is positively related to the amount of voluntary disclosure. Thus, the articles above claim that foreign ownership has a significantly positive effect on the disclosures.

Concerning the actuarial assumptions, they are disclosed in the footnotes. Thus, the studies examining the effect of foreign ownership on footnote disclosure can be used to reveal the relationship between foreign ownership and the disclosure level of actuarial assumptions.

Karim et al. (2006) examine the determinants of disclosure level of environmental disclosures in footnotes. Their findings claim that firms with more foreign ownership tend to have less environmental disclosure. A possible reason for the negative effects of foreign ownership on environmental disclosure could be that firms with higher foreign concentration are more likely to have higher scrutiny from various countries and communities.

The previous findings strongly suggest that the firms with more foreign ownership tend to have more disclosures: on the one hand, the firms provide more information to reduce the information asymmetry level faced by the foreign investors (Oxelheim and Randoy 2003); on the other hand, foreign investors tend to invest in firms that disclose comparably more information (Bokpin and Isshaq

²⁶ A corporate report here means the corporate governance report.

2009). Furthermore, other studies (Karim et al. 2006; Bryant-Kutcher et al. 2008) have found that the foreign ownership affects the footnote disclosure. Based on this argumentation, I would expect a positive association between foreign ownership and DAS. Thus, I set my fourth hypothesis as follows:

H4: There is a positive relationship between foreign ownership and disclosure level of actuarial assumptions.

Many scholars (e.g. Fasshauer et al. 2008; Fried and Davis-Friday 2013; Bauman and Shaw 2014) find that the pension funded status has significantly affected pension disclosures regardless how the pension funded status is calculated²⁷.

Fried and Davis-Friday (2013) study managements' reaction to the disclosure changes under SFAS No. 158. Specifically, firms are required to recognize their pension funded status in the balance sheet under the SFAS No. 158. After investigating 994 firms from 2004 to 2007, the authors find that the recognition of pension funded status increases the liabilities of most firms (i.e. over 90%) and management tend to mitigate this impact by using a higher discount rate. Even though the SFAS No.158 requires relocation of pension funded status rather than changes in measurement of pension funded status, the pension funded status becomes clearer (i.e. lower) to users of financial reporting due to the difference between recognition and disclosure. Thus, the management employs a higher discount rate to mitigate the effects of 'decreased' funded status.

Fasshauer et al. (2008) study the IAS 19 and point out that the companies with unfunded status pension plans tend to have full recognition (i.e. immediate recognition of actuarial gains and losses) rather than adopting the corridor method (i.e. the deferred recognition of actuarial gains and losses). This is because they need to give investors and potential investors clear and reasonable explanations for their comparable weak debt-paying ability. However, they point out that this result should be viewed with caution, as the corridor method allows for off-balance sheet financing.

Moreover, Bauman and Shaw (2014) examine the sensitivity disclosure of actuarial assumptions and claim that the pension funded status has been used to assess part

²⁷ There are two different methods of calculating the pension funded status: a) some scholars calculate the pension funded status according to the SFAS No. 87 (i.e. the pension accounting standard issued by the Financial Accounting Standards Board in 1985), which defines the pension funded status equal to the differences between the pension plan assets and the projected benefit obligation (i.e. $FS = PPA - PBO$). b) since the adoption of SFAS No.158 (i.e. the successor of SFAS No. 87), firms are required to recognize the pension funded status as the net pension liabilities (assets) in the balance sheet. Thus, the pension funded status has an immediate influence on the balance sheet, and further influences the firm's financial situation.

of firm risk. Thus, firms with higher pension funded status are associated with lower risk and are less likely to have detailed disclosure of actuarial assumptions (i.e. as the disclosure of actuarial assumptions can clarify the pension funded status and make it clear to users of financial statement). In contrast, firms with lower pension funded status tend to have more disclosures about actuarial assumptions.

As a result, the pension funded status continues to be one of the most important criteria to assess the financial position (e.g. debt-paying ability, operation capability, profitability) of a company. Even though previous articles have mixed findings, they all suggest that the lower pension funded status is related to higher risk and thus leads to higher level disclosures. Concerning the actuarial assumptions, they can be used to explain/calculate the pension funded status and the pension funded status is found to have significant effects on firms' disclosure of actuarial assumptions (e.g. Bauman and Shaw 2014). Thus, the fifth hypothesis is formed as:

H5: There is a negative relationship between pension funded status and the disclosure level of actuarial assumptions.

4.2 The corridor method

This section develops hypotheses about the determinants of adopting the corridor method and hypotheses concerning the non-compliance disclosures.

The corridor method, known as one of the accounting choices in recognizing the actuarial gains and losses, has been used by many firms, as it allowed the conditional²⁸ non-recognition of actuarial gains and losses which influence the amount recognized in the balance sheet (i.e. the net defined benefit liability or asset). The application of the corridor method can be used to smooth the pension liability and adjust the liabilities, assets and equity in the balance sheet.

The removal of the corridor method is an important change from the IAS 19 to IAS 19R, which may cause changes on the equity for firms that used to use the corridor method. Moreover, even though the corridor method has been abolished, the IAS 19R allows discretion in disclosing actuarial assumptions. Moreover, there are accounting standards under the IASB which permit discretionary accounting choices (e.g. the IAS 40, which allows both the cost and fair value methods to

²⁸ The condition of using the corridor method is: if the net cumulative unrecognized actuarial gains and losses were within the 'corridor' (i.e., the greater of 10% of the defined benefit obligation and 10% of the fair value of any plan assets).

calculate the investment properties). Thus, the examination of the corridor method shows the advantages and disadvantages of the discretionary accounting choices.

4.2.1 The determinants of using the corridor method

This examination of the corridor method begins with the determinants of using the corridor method. Under the IAS 19 (2004 version) there are three methods available for recognizing the actuarial assumptions: the immediate recognition in profit or loss; the immediate recognition in other comprehensive income which transfers to retained earnings (i.e. the equity method) and the corridor method. Even though the IASB claimed that they preferred the immediate recognition method, which will make the recognition of actuarial gains and losses become immediate either via other comprehensive income, or profit or loss (IAS 19: para. 48A-48EE), many firms choose to use the corridor method. Thus, what lies behind the decision to use the corridor method is of interest.

It has been found that a company's level of leverage and debt affect the management's accounting choices (Watts and Zimmerman 1986, 1990; Dhaliwal 1980; Press and Weintrop 1990; Duke and Hunt 1990). Moreover, according to Fasshauer et al. (2008), the unrecognized actuarial losses may have an effect on the adoption of the corridor method. In addition, firms with unrecognized actuarial losses will increase their recognized pension liability when transforming from the corridor method to the equity method²⁹, on average. Since the pension liability is recognized in the balance sheet, which constitutes the liabilities, firms with higher leverage may thus choose to use the corridor method in order to reduce their recognized pension liability. Furthermore, Morais (2010) suggests that firms with high leverage need to mitigate the influences of debt. Therefore, the corridor method could be a viable choice to reduce the defined benefit liability, which results in a reduction of the debt and the level of leverage. Hence, my sixth hypothesis is:

H6: Companies with higher leverage tend to adopt the corridor method.

²⁹ Under the IAS 19, there are three choices for recognizing the actuarial assumptions: the corridor method; the immediate recognition of actuarial assumptions in the other comprehensive income and they are transferred directly to the retained earnings (i.e. equity method); and the immediate recognition in profit or loss. Except for the corridor method, the other two methods are full recognition. (IAS19R, para. BC 66, 2013)

Previous studies (e.g. Dhaliwal et al. 1982) have found an association between ownership structure and different kinds of accounting choices. Dhaliwal et al. (1982) focus on accounting choices of the depreciation method and investigate the relationship between firms' accounting choices and their ownership structure. Their results suggest that, compared to owner-controlled firms ³⁰, the management-controlled firms are more likely to adopt the income increasing depreciation method. Moreover, Carlson and Bathala (1997) study the association between the ownership structure and income smoothing behavior (e.g. the cost method of inventory), claiming that there is a negative relationship between the inside ownership and the managers' incentive of choosing accounting method which results in smoother income.

Later, scholars (e.g. Watts and Zimmerman 1978) go a step further studying the agency problem involved in the relationship between ownership structure and accounting choice, and imply that the ownership structure affects the adoption of an accounting method. Watts and Zimmerman (1978) point out that, compared with the owner-controlled firms, the management-controlled firms are more likely to choose the profit increasing accounting methods. Dempsey et al. (1993) investigate the financial statement disposition of extraordinary items and claim that the managers without ownership tend to adopt the increase-profit accounting method. Furthermore, Astami and Tower (2006) study the relationship between the ownership structure and accounting choices, concluding that the firms with a lower level of ownership concentration tend to pursue the income-increasing accounting method.

There are two main arguments that explain the preference of income-increasing accounting choices by management-controlled firms: first, the firms' earnings are related to managers' compensation, hence, they are more likely to choose the income-increasing accounting method (e.g. Watts and Zimmerman 1986); second, management tends to select the income-increasing accounting method in order to cover their poor performance and satisfy shareholders (e.g. Hindley 1970).

Based on the previous articles, the ownership structure affects the choices of accounting methods. Since the management has incentives to maximize their self-interest (e.g. Astami and Tower 2006), firms with less concentrated ownership are more likely to adopt the income-increasing accounting method. The corridor method, however, is an accounting choice that can be used to affect firms' profit³¹.

³⁰ Firms that have one party with 10% or more voting stock and exercise active control or 20% or more voting stock are owner-controlled firms in this article.

³¹ The corridor method influences the recognition of actuarial gains and losses, and the actuarial gains and losses are one of the components constituting the net defined benefit liability (asset). Moreover, the net defined benefit liability (asset) is recognized in the balance sheet which directly influences firms' financial position. Hence, the corridor method can be used to influence firms' profits.

Thus, firms with less ownership concentration may choose to use the corridor method than the firms with more concentrated ownership. Hence, the following hypothesis is formed:

H7: There is a negative relationship between the ownership concentration and the adoption of corridor method.

4.2.2 The non-compliance disclosure about corridor method

According to IAS 19R (para. 173), entities should apply the IAS 19R retrospectively in accordance with IAS 8. Moreover, IAS 8 (para. 22) states that “*When a change in accounting policy is applied retrospectively, the entity shall adjust the opening balance of each affected component of equity for the earliest prior period presented and the other comparative amounts disclosed for each prior period presented as if new accounting policy had always been applied*”. Hence, firms that do not have a retrospective restatement about the corridor method after adopting the IAS 19R are classified as non-compliance with IFRSs, because non-compliance firms fail to “*fully provide the information required by pertinent reporting standards*” (Glaum et al. 2013).

Glaum et al. (2013) further define reasons for non-compliance as unintentional behaviors and intentional behaviors of managers. The unintentional behaviors can be explained as managers’ misunderstanding or misinterpretation of the accounting rules. The intentional behaviors are due to company characteristics based on studies (Defond and Jiambalvo 1991; Dechow et al. 1996) among US firms that restate accounting errors mandatorily. Moreover, studies on the compliance of mandatorily applied IFRSs also suggest firm characteristics as determinants of firms’ compliance level (Cascino and Gassen 2015). For example, Cascino and Gassen (2015) find that the firm size, profitability, the corporate governance characteristics, and the employment of Big Four firms, are strongly associated with the compliance level.

Jensen and Meckling (1976) ascribe the information asymmetry to the separation of ownership and control, and many researchers (e.g. Defond and Jiambalvo 1991; Hossain et al. 1994; Leuz and Wysocki 2008) follow this opinion and discuss the relationship between ownership structure and disclosure level. For firms whose ownership is widely dispersed, more disclosures are needed (Hossain et al. 1994). Therefore, they are more likely to have compliance disclosure, because small investors have limited rights on monitoring management and firms have to deal with this problem (Glaum et al. 2013). Moreover, when a firm has large shareholders, they are more likely to use their control right on monitoring

management, which leads to a higher level of compliance and disclosures (Defond and Jiambalvo 1991; Dechow et al. 1996). However, when a firm has a dominant shareholder, it is less likely to have a high disclosure level (Leuz and Wysocki 2008) and non-compliance with disclosure requirements may appear. This is because they have the incentive to control the firm and can benefit from the information asymmetry. Thus, the ownership structure affects the disclosure quality. Furthermore, Glaum et al. (2013) conclude that ownership structure has an inverted U-shaped relationship with the disclosure compliance.

Previous studies predict a relationship between ownership concentration and disclosures, which further assumes the ownership concentration affects the compliance of disclosures. Since both the lower ownership concentration and extremely high ownership concentration (dominant shareholder) lead to a lower disclosure level (Leuz and Wysocki 2008), it is hard to predict the direction of the association between ownership concentration on compliance disclosure. Thus, a null hypothesis is suggested:

H8: There is no relationship between the ownership concentration and compliance disclosure.

4.3 The effects of adopting the IAS 19R

This section focuses on the effects of adopting the IAS 19R. Since the number of articles in this field is limited, four hypotheses are formed based on previous articles about IFRS, the opinions about the IAS 19R of standard-setters in this field (i.e. Hans Hoogervorst, the chairman of the IASB) and articles about pension accounting.

As stated earlier, the corridor method was an option to defer the recognition of actuarial gains and losses given by the IAS 19 (2004 version) before the revision of the standard. The corridor method could be used to smooth the pension obligation and further adjust the numbers in balance sheet. However, the IAS 19R abolishes the corridor method, thus the corridor method users may use different measures to mitigate the effects of pension obligation.

The discount rate, which reflects the time value of money, has been used to measure the present value of defined benefit obligation and pension cost (i.e. service cost and interest cost). Moreover, the higher (lower) discount rate leads to the more (less) time value of money and results in less (more) present value of defined benefit obligation. For example, Amir and Gorden (1996) examine the relationship between the choices of firms' selected assumptions (i.e. discount rate

and healthcare cost trend rates) and firms' characteristics under SFAS No. 106 (i.e. a pension accounting standard issued by the FASB in 1985), and their results indicate that firms with more defined benefit obligations and higher leverage tend to choose a higher discount rate. Comprix and Muller (2011) examine the freezing of pension plans (i.e. employers reduce or eliminate growth in benefits) and find that employers tend to use a lower discount rate and expected rate of return when freezing their pension plan. In order to freeze the pension plan, employers need to show that they are facing costly defined benefit plans. Thus, the employers tend to use a downward-biased discount rate and expected rate of return. In addition, Fried and Davis-Friday (2013) study 994 firms and point out that managers adopt a higher discount rate to reduce the increase in the pension liability caused by the change of the accounting policy from disclosure of the funded status (under the corridor method) to the recognition of funded status.

To summarize, studies suggest that management tend to use the discount rate to modify the pension obligation. As the removal of the corridor method affects the pension obligation for those firms that previously used the corridor method, the corridor method users are expected to use the discount rate mitigating the impacts of removing the corridor method. However, since the impacts of removing the corridor method on the corridor method users could be different (i.e. increased defined benefit liabilities or decreased defined benefit liabilities), the corridor method users may use different discount rates to deal with different situations (e.g. use a higher discount rate to reduce the increased liabilities). Moreover, different management incentives may lead to different choices on the discount rate (e.g. management may choose a lower discount rate to increase the pension liabilities to obtain tax benefits). Thus, the removal of the corridor method is expected to affect corridor method users' choices of discount rate, but the effect is uncertain, thus, my ninth hypothesis is built as a null hypothesis:

H9: There is no relationship between corridor method users' discount rate and the removal of the corridor method.

Even though Picconi (2006) doubts whether analysts and investors use footnote-disclosed pension information in predicting earnings, most articles contend that there is a relationship between the pension information and the price of equity shares (e.g. Barth et al. 1992; Amir and Gordon 1996). For example, Amir and Gordon (1996) point out that the disclosed post-retirement benefit liabilities affect the equity value.

The IAS 19R, which abolishes the corridor method and requires the immediate recognition of actuarial gains and losses in other comprehensive income is quite similar to the SFAS No. 158. The SFAS No 158, however, issued in 2006 by the FASB, requires the unrecognized actuarial gains and losses to be recognized as accumulated other comprehensive income (AOCI). Ever since the SFAS No. 158 came out, various professional agencies (e.g. Watson Wyatt Worldwide 2006) have studied the AOCI, because it is the adjustment amount which is reported in stockholders' equity. According to Mitra and Hossain (2009), the AOCI is termed as pension transition adjustment and they find that the pension transition adjustment negatively affects stock prices and returns. Thus, based on the studies of SFAS No. 158, it is possible to assume that the removal of the corridor method decreases the stock price and return of corridor method users. Furthermore, Hans Hoogervorst (2016) suggests that the removal of the corridor method contributes to the full-view of pension liability in the statement of financial position, which may not only directly affect profit or loss and lead to more realistic pension arrangements, but also reduce the dividend payments.

The studies above suggest that firms recognize their unrecognized actuarial gains and losses may decrease their stock price and returns (Mitra and Hossain 2009) and thus reduce their dividend payments. Since the IAS 19R removes the corridor method, the corridor method users have to recognize their unrecognized actuarial gains and losses immediately. Thus, the corridor method users have incentives to reduce the dividend payables under IAS 19R. Hence, my tenth hypothesis is:

H10: The corridor method users reduce their dividend payments after the application of IAS 19R.

Several studies (e.g. Feldstein and Morck 1983; Fried 2012; Fried and Davis-Friday 2013) have found that there is a relationship between leverage and management reporting choices. For example, Fried (2012) study the lobbying behavior of firms on the releasing of the SFAS No.158 exposure draft and find that firms with a high leverage and poor liquidity are more inclined to oppose the new standard.

According to Morais (2008), who investigates the IAS 19 (the 2004 version) on its three methods of recognizing the actuarial gains and losses (i.e. the corridor method, the equity method and profit or loss), the firms with larger size, lower leverage and less profitability are more likely to adopt the corridor method. Since the corridor method conditionally allows the non-recognition of actuarial gains and losses, many firms choose to use this method to avoid "*undesirable pension-induced equity volatility and leverage*" (Barthelme et al. 2019).

In the presence of the IAS 19R, firms have to immediately recognize actuarial gains and losses in other comprehensive income. Furthermore, the actuarial gains and losses affect the net defined benefit liability, which is recognized in the balance sheet. Thus, the abolishment of the corridor method will increase the volatility in the balance sheet of corridor method users.

In summary, previous studies claim that leverage is not only a determinant of using the corridor method, but also an economic consequence of employing the corridor method (Morais 2008). Moreover, as the corridor method users must recognize the actuarial gains and losses under the IAS 19R, they have to face the volatility on the balance sheet. More specifically, most corridor method users defer the recognition of actuarial losses, which leads to increased pension liability after adopting the IAS 19R. Hence, the corridor method users are expected to have increased leverage as a response to the removing of the corridor method under the IAS 19R. Thus, Hypothesis 11 is built as follows:

H11: The corridor method users tend to increase their leverage as a response to adopting the IAS 19R.

The removal of the corridor method is required under the IAS 19R, which has been put into use since 2013 and allows the early adoption. Thus, the IAS 19R provided an opportunity for firms to choose a different time to employ it.

The time of adopting an accounting method has been widely thought of as a 'cosmetic strategic choice' to manage earnings (Smith and Rezaee 1995), and many studies (Smith and Rezaee 1995; Scott 1991; Sami and Welsh 1992; Kwon et al. 2008) have examined management incentives to early adopt or late adopt an accounting method. For example, Kwon et al. (2008) investigate the adoption of the SFAS 121 concerning the disclosures of asset write-down information, finding that early adopters tend to have a positive market reaction, more capital expenditures and higher profitability than late adopters. Moreover, Sami and Welsh (1992) examine early adopters of the SFAS No. 87, and their results indicate that the early adopters are quite different from other adopters of the SFAS No. 87; they are in a comparably larger size, have more fully funded pension obligations, are more constrained on interest coverage, and are subject to accounting-based debt constrains (Sami and Welsh 1992).

Previous studies show that firm size, their leverage, as well as profits, affect firms' decision to be an early adopter. Concerning the IAS 19R, it increases the volatility on net-defined benefit liabilities (i.e. it is recognized on the balance sheet) of

corridor method users by requiring immediate recognition of actuarial gains and losses. Thus, compared to other firms, corridor method users may need a longer time to mitigate the volatility (i.e. the increased pension liabilities) caused by the removal of corridor method and hence are less likely to be early adopters of IAS 19R. Thus, my twelfth hypothesis is:

H12: Corridor method users are less likely to early adopt the IAS 19R.

5 DATA AND RESEARCH DESIGN

This chapter comprises five parts. The first part shows the process of sample selection. The second part analyzes the sample and shows its distribution among different countries and industries. The third to the fifth parts build models for the three research questions investigated in this dissertation and present the dependent variables, test variables and control variables included in the models.

5.1 Sample selection

This dissertation chooses to study listed firms from France, Germany, Sweden and Italy³² as they are required to follow the IFRSs. In addition, the four countries are from different parts of Europe (i.e. Western Europe, Central Europe, Northern Europe and Southern Europe), and each of them is quite influential (i.e. has the largest population) in their own region³³. Moreover, this dissertation will be published in Europe.

The sample consists of 200 listed firms with 50 each from France, Germany, Sweden and Italy. All the firms are selected from the Orbis database. I begin with all active companies and companies with an unknown situation in Orbis, which is 120,817,188 companies (see Table 2 step 1). Then only the listed firms are left, which results in 62,494 firms (see Table 2 step 2). My third step is to find out the listed firms from France, Germany, Italy and Sweden, and this step leaves 4,576 firms (see Table 2 step 3). Next, I control the firm size. In order to form a comprehensive opinion about the changes under IAS 19R, various firms are included: the number of employees is required to be not less than 10 (see Table 2 step 4), the total assets (see Table 2 step 5) and the operating revenue (see Table 2 step 6) are required to be not less than 2,000,000 USD in its last available year, and these three steps result in 2,875 firms (see Table 2 step 6). In addition, since this dissertation studies pension accounting standards, I require that the firms' financial statements should include and have non-zero value on pension fund provisions (see Table 2 step 8) for the last 3 available years, and this results in 1,296 firms. Finally, I randomly select 50 companies from each country and make my final sample of 200 companies (see Table 2 step 9). Table 2 shows the sample selection steps, and each searching/selecting step from Orbis has a step result and search result. The step results are the results caused by the search requirement of

³² I did consider the UK-listed firms, but they did not use the corridor method before the IAS 19R came out, thus they are not included in the sample.

³³ For example, France is the country that located in the Western Europe with the largest population, while Germany is the biggest country in Central Europe.

this step, and the search results are the results caused by accumulated search requirements.

Table 2. Sample selection

Step	Sample selection	Step results	Search results
1	All active companies and companies with unknown situation	120,817,188	120,817,188
2	Publicly listed companies	63,322	62,494
3	Countries: France, Germany, Italy, Sweden	30,861,769	4,576
4	Number of employees: Have at least 10 employees for last 3 available years	7,581,673	3,152
5	Total assets: Have more than 2 million USD ³⁴ total assets for the last available year	2,490,219	3,060
6	Operating revenue (Turnover): have more than 2 million USD operating revenue for the last available year	3,493,527	2,875
7	Total assets: All companies with a known value for Last 3 available years	17,423,212	2,875
8	Pension Fund Provisions: All companies with a known value for last 3 available years	14,241	1,296
9	Randomly selecting 200 firms (i.e. 50 firms from each country) as the final sample	200	200

Note: From the third step to the final step, the companies with no recent financial data and Public authorities/States/Governments are excluded. The sample selection from Orbis has been performed on 19/01/2015, and this step selects firms that have more than 2 million USD total assets for the last available year, which is 2014, and the foreign exchange rate from 1 USD to Euro on 31/12/2014 is 0.8266, thus 2 million USD is 1.6532 million Euros. Moreover, the foreign exchange rate from 1 USD to Euro on 31/12/2008 is 0.7152, on 31/12/2009 is 0.6985, on 31/12/2010 is 0.7474, on 31/12/2011 is 0.7728, on 31/12/2012 is 0.7578, on 31/12/2013 is 0.7275, and on 31/12/2015 is 0.9207.

³⁴ The sample selection from Orbis was performed on 19/01/2015, and this step selects firms that have more than 2 million USD total assets for the last available year, which is 2014, and the foreign exchange rate from 1 USD to Euro on 31/12/2014 is 0.8266, thus 2 million USDs is 1.6532 million Euros. Moreover, the foreign exchange rate from 1 USD to Euro on 31/12/2008 is 0.7152, on 31/12/2009 is 0.6985, on 31/12/2010 is 0.7474, on 31/12/2011 is 0.7728, on 31/12/2012 is 0.7578, on 31/12/2013 is 0.7275, and on 31/12/2015 is 0.9207.

5.2 Descriptive analysis of the sample

This section presents the descriptive analysis of the sample, which focuses on the number of employees, the total assets, the operating revenue, the countries and the industries. This dissertation studies the IAS 19R on three research questions that have different data across different periods, but this part will show data from 2008 to 2015, which is the longest data period in this dissertation as this is the general analysis of the sample and only includes the very important three variables. All the financial ratios included in this dissertation have been winsorized at the 1% level at both tails.

This section begins by showing the industry distribution of the sample, and then presents the analysis of the total assets, operating revenue and the number of employees in different industries, from different countries and during different years.

5.2.1 The industry distribution

This part examines the industry distribution and further illustrates the industry distribution among different countries. Tables 3 and 4 present the industries included in the sample. Since there are very few firms in some industries, a classification with three sectors is created, which has been presented in Table 5.

It can be seen from Tables 3 and 4 that the three biggest industries are: Machinery (i.e. 32.5%), Other service (i.e. 16.5%) and Chemistry (i.e. 12.5%). The other industry fields contain fewer firms. For example, the field of Food contains only 2% of firms in the sample. Moreover, the proportion of firms from the Machinery sector varies considerably between the countries: 24 German firms (i.e. 48%), 9 French firms (18%), 14 Italian firms (28%) and 18 Swedish firms (i.e. 36%) are in the field of Machinery.

Thus, the industry distribution of the sample is extremely unbalanced. As a result, I re-classified the industry field and combine some fields based on the three-sector model in economics (i.e. the primary sector, the secondary sector and the tertiary sector). Moreover, I keep the top three industry fields (i.e. Machinery, Chemistry and Other service), and re-classified the rest as: Other industries in Primary and Secondary sectors and Other industries in Tertiary sectors. Table 5 shows the re-classification, in which the industry fields included in this sample become: Machinery, Other service, Chemistry, Other industries in Primary and Secondary sectors and Other industries in Tertiary sector. Compared with the original industry distribution, the re-classification is significantly more balanced.

Table 3. The industry distribution of the sample

Industry	Frequent.	Percent.	Cumulate.
Chemistry	25	12.5	12.5
Construction	9	4.5	17
Food	2	1	18
Gas	2	1	19
Hotel	3	1.5	20.5
Machinery	65	32.5	53
Metals	11	5.5	58.5
Publishing	13	6.5	65
Textiles	2	1	66
Wood	6	3	69
Transport	6	3	72
Education	4	2	74
Other service	33	16.5	90.5
Primary	3	1.5	92
Post & telecommunications	5	2.5	94.5
Wholesale	11	5.5	100
Total	200	100	

Table 4. The industry distribution of the sample among different countries

	Germany	France	Italy	Sweden	Total
Chemistry	7	8	8	2	25
Construction	1	3	3	2	9
Education	0	4	0	0	4
Food	0	1	1	0	2
Gas	0	1	1	0	2
Hotel	0	2	1	0	3
Machinery	24	9	14	18	65
Metals	1	3	1	6	11
Other service	7	12	5	9	33
Post & telecommunications	1	1	2	1	5
Primary	0	1	2	0	3
Publishing	3	0	6	4	13
Textiles	0	0	2	0	2
Transport	4	1	1	0	6

Table 4. Continued

	Germany	France	Italy	Sweden	Total
Wholesale	1	3	2	5	11
Wood	1	1	1	3	6
Total	50	50	50	50	200

Table 5. Re-classification of the industry distribution

Industry	Country					Total	Percentage
	DE	FR	IT	SE			
Machinery	24	9	14	18	65	34.6%	
Other service	7	12	5	9	33	15.27%	
Chemical	7	8	8	2	25	9.33%	
Primary sector	0	1	2	0	3		
Food, beverages, tobacco	0	1	1	0	2		
Textiles, wearing apparel, leather	0	0	2	0	2		
Construction	1	3	3	2	9		
Gas, Water, Electricity	0	1	1	0	2		
Metals & metal products	1	3	1	6	11		
Wood, cork, paper	1	1	1	3	6		
Other industries in Primary & Secondary sector	3	10	11	11	35	19.8%	
Hotels & restaurants	0	2	1	0	3		
Education, Health	0	4	0	0	4		
Post & telecommunications	1	1	2	1	5		
Publishing, printing	3	0	6	4	13		
Transport	4	1	1	0	6		
Wholesale & retail trade	1	3	2	5	11		
Other industries in Tertiary sector	9	11	12	10	42	21%	
Total	50	50	50	50	200		

5.2.2 Company information

This section presents the total assets (TA), operating revenue (OR) and the number of employees (NE) of the sample. The analysis begins with a summary of TA, OR and NE, and then shows the distribution of the three variables among different countries, industries and in different years.

Table 6 summarizes the TA, OR and NE of the whole sample and the data are collected in the year firms adopted the IAS 19R and one year previously. The unit of TA and OR is in millions of Euros (i.e. MEUR).

Panel A shows the TA, OR and NE of firms in the first year with IAS 19R. It can be seen from Panel A that all of the three variables have high standard deviation. Moreover, the minimum value and the maximum value of the three variables are dramatically different. Thus, there is considerable variation in the size measured with assets and sales between the firms in the sample (in the first year with IAS 19R).

Panel B compares the TA, OR and NE in the year firms first use the IAS 19R with one year previously (i.e. under IAS 19). It can be seen that the mean value of total assets and the number of employees are decreased while the mean value of operating revenue is increased. However, the changes in the mean value of the three variables are not significant, and thus the results show that the adoption of the IAS 19R does not change firms' mean value of size and sales.

Table 6. Summary of Total assets, Operating revenue and Number of employees

Panel A. Summary of Total assets, Operating revenue and Number of employees in the adopting year of IAS 19R

Variables	Total assets	Operating revenue	Number of employees
Observations	200	200	200
mean	8709.128	5844.413	24848
Standard deviation	28589.4	15162.4	63511.67
min	24.729	2.01	10
max	324333	115696.5	572800

Panel B. Comparison of Total assets, Operating revenue and Number of employees

Variables	Observations under IAS 19	Mean	Observations under IAS 19R	Mean	Mean Diff
Total assets	200	8688.5	200	8709.128	-20.628
Operating revenue	200	5953.609	200	5844.413	109.196
Number of employees	200	23950	200	24848	-897.53

Table 7 shows the distribution of TA, OR and NE among different countries in the year of adopting the IAS 19R. It can be seen from Panel A that German firms have bigger standard deviation of TA, OR and NE compared to other firms, which indicates that German firms have more volatility in firm size and sales. Panel B shows that the mean values of TA, OR and NE among French firms are significantly different from those for Swedish firms. Moreover, French firms and Italian firms have significant differences in the mean value of NE. Panel C suggests that the median value of TA and NE between firms from France and Sweden is significantly different. Furthermore, it is found that the German firms and French firms are significantly different in the median value of number of employees. To conclude, firms from different countries may have significantly different TA, OR and NE in their first year with IAS 19R.

Table 7. Summary of Total assets, Operating revenue and Number of employees among different countries in the year of adopting IAS 19R

Panel A. The standard deviation of total assets, number of employees and operating revenue among different countries

	Germany	France	Italy	Sweden
Total assets (MEUR)	48636.03	18927.61	22540.55	6198.032
Operating revenue (MEUR)	19386.14	15386.67	16692.12	4869.304
Number of employees	88062.92	76509.98	18945.09	42813.59

Panel B. Comparison of mean value of Total assets, Number of employees and Operating revenue among different countries

	Total assets	Number of employees	Operating revenue
Mean value in Germany	12000	28000	6897.652
Mean value in France	11000	43000	8581.024
Mean value in Italy	7965.362	12000	5090.833
Mean value in Sweden	3375.837	17000	2808.141
Germany vs France	1265.325	-15000	-1700
Germany vs Italy	4414.957	16000	1806.819
Germany vs Sweden	9004.482	11000	4089.511
France vs Italy	3149.632	31000***	3490.191
France vs Sweden	7739.157***	26000**	5772.883**
Italy vs Sweden	4589.525	-5200	2282.692

Table 7. Continued

	Total assets	Number of employees	Operating revenue
Median value in Germany	956.51	3870.5	660.772
Median value in France	1704.383	8198	1180.034
Median value in Italy	1389.531	4062	1200.597
Median value in Sweden	760.426	3043.5	743.502
Germany vs France	2.56	4.000**	0.64
Germany vs Italy	0.64	0.16	0.64
Germany vs Sweden	0.64	0.64	0.16
France vs Italy	0.16	2.56	0
France vs Sweden	4.000**	5.760**	1.44
Italy vs Sweden	1.44	1.44	1.44

Table 8 summarizes the TA, OR and NE among different industries in the first year when firms use the IAS 19R. It can be seen from Panel A that firms in the field of Other industries in the Primary and Secondary sectors (i.e. as described in Table 5 including firms in the field of Primary sector, Food, Textiles, Construction, Gas, Metals and Wood) have the smallest standard deviation of TA, OR and NE. Panel B shows that the mean value of TA and OT in the field of Other service is significantly different from firms in the field of Chemical, Other industries in Primary and Secondary sectors and Other industries in Tertiary sector (which includes firms in the field of Hotels and restaurants, Education, Post & telecommunications, Publishing, Transport and Wholesale, which can be found in Table 5). Thus, industry has an effect on the firm size and sales in the year of adopting the IAS 19R.

Table 8. Summary of Total assets, Operating revenue and Number of employees among different industries in the year of adopting IAS 19R

Panel A. The standard deviation of Total assets, Number of employees and Operating revenue among different industries

	Machinery	Chemistry	Other Service	Other industries in Primary & Secondary sector	Other industries in Tertiary sector
Standard deviation of Total assets	19758.74	18764.88	18981.79	18006.02	22199.73
Standard deviation of Operating revenue	56921.66	51989.15	51202.23	48752.32	54299.03
Standard deviation of Number of employees	13963.73	12470.36	14311.29	12464.31	12764.07

Panel B. Comparison of mean value of Total assets, Number of employees and Operating revenue among different industries

	Total assets	Number of employees	Operating revenue
Mean value in Chemical field	10000	23000	6879.379
Mean value in Machinery field	9505.131	29000	5668.949
Mean value of Other industries in Tertiary sector	10000	28000	6965.737
Mean value in Other service field	2652.989	14000	1126.246
Mean value of Other industries in Primary and Secondary sector	10000	24000	8533.98
Chemical vs Machinery	940.542	-6000	1210.429
Chemical vs Other industries in Tertiary sector	415.427	-5000	-86.358
Chemical vs Other service	7792.684*	9764.348	5753.133**
Chemical vs Other industries in Primary and Secondary sector	330.495	-274.183	-1700

Machinery vs Other industries in Tertiary sector	-525.115	1030.221	-1300
Machinery vs Other service	6852.142	16000	4542.703
Machinery vs Other industries in Primary and Secondary sector	-610.047	5722.811	-2900
Other industries in Tertiary sector vs Other service	7377.258*	15000	5839.491**
Other industries in Tertiary sector vs Other industries in Primary and Secondary sector	-84.932	4692.59	-1600
Other service vs Other industries in Primary and Secondary sector	-7500*	-10000	-7400**

Panel C. Comparison of median value of Total assets, Number of employees and Operating revenue among different industries

	Total assets	Number of employees	Operating revenue
Median value in Chemical field	2210.422	4085	1480.292
Median value in Machinery field	784.959	3952	745.843
Median value of Other industries in Tertiary sector	1236.26	4643.5	1208.143
Median value in Other service field	739.27	3530	683.528
Median value of Other industries in Primary and Secondary sector	1748.472	5656	1524.1
Chemical vs Machinery	1.385	0.055	0.498
Chemical vs Other industries in Tertiary sector	0.726	0.025	0.12
Chemical vs Other service	1.758	0.633	1.758
Chemical vs Other industries in Primary and Secondary sector	0.069	0.069	0.069
Machinery vs Other industries in Tertiary sector	0.756	0.756	0.224
Machinery vs Other service	0.046	0.046	0.046
Machinery vs Other industries in Primary and Secondary sector	2.154	1.099	1.099
Other industries in Tertiary sector vs Other service	1.125	1.125	0.355
Other industries in Tertiary sector vs Other industries in Primary and Secondary sector	0.111	0.111	0.625
Other service vs Other industries in Primary and Secondary sector	2.885*	2.885*	2.885*

To conclude, this section analyzes the sample among different industries and countries, in order to offer a clear view of the sample. The results of the analysis in this section suggest that industry and country have an effect on firm size and profitability and therefore the two factors should be included in the later tests.

5.3 Empirical models for disclosure level of actuarial assumptions

This section shows the process of building the models for DAS (disclosure level of actuarial assumptions), which begins with the measurement of DAS, and then the models for examining Hypotheses 1 to 5.

5.3.1 Measurement of disclosure level of actuarial assumptions

This part shows the measurement of DAS, which begins with the method of assessing the DAS, followed by the definition of DAS and then clarifies the assessment steps of DAS. Finally, an example of the assessment of DAS is presented.

In order to assess the disclosure level of actuarial assumptions, the following equation is formed (all the variables are explained in the Appendix):

$$\begin{aligned}
 DAS_i = & (MORTALITY_i + EMP_TURNOVER_i + DISABILITY_RATIO_i + \\
 & EARLY_RETIRE_i + DEP_i + DISC_RATE_i + BENEFIT_i + \\
 & SALARY_FUTURE_i + MEDICAL_COSTS_i) / 9 = (Text_D_j + Quanti_D_j + \\
 & Sensiti_D_j) / 27
 \end{aligned} \tag{1}$$

This equation can be classified into two parts: the first part defines the actuarial assumptions, while the second part defines how to assess the disclosure level. The disclosure level of each actuarial assumption is assessed through three criteria: whether each actuarial assumption has textual disclosure, quantitative disclosure and sensitivity disclosure. Moreover, each criterion takes the value 1, thus each actuarial assumption of the first part takes the values 0 to 3 and the i is used as the subscript. Since there are 9 actuarial assumptions, the value range of textual description of DAS, the quantitative description of DAS, as well as sensitivity disclosure of DAS, is from 0 to 9 and j is used as subscript in the second part. In

order to make the value range of DAS taken as 0 to 1, the DAS is calculated as the sum value of the 9 actuarial assumptions (or the sum value of textual description, quantitative description and sensitivity disclosure of DAS) divided by 27 (i.e. there are 9 items under DAS and each item is assessed by 3 criteria, thus altogether 27).

I classified the information about actuarial assumptions according to the both IAS 19R (para. 76) and IAS 19 (para. 73). Both standards agree that the actuarial assumptions can be classified as demographic assumptions and financial assumptions. Moreover, both of them define actuarial assumptions as including: mortality, rates of employee turnover, disability, early retirement, dependents, claim rates under medical plan, discount rate, benefit levels, future salary and future medical costs. However, the IAS 19R also includes payment option and tax payable but excludes the expected rate of return when defining the actuarial assumptions compared with the IAS 19. Since this dissertation intends to compare the disclosure level of actuarial assumptions under the IAS 19 and IAS 19R, only the same items included are used to define the actuarial assumptions: the mortality (MORTALITY), the rates of employee turnover (EMP_TURNOVER), the rates of disability (DISABILITY_RATIO), the rates of early retirement (EARLY_RETIRE), the proportion of dependents (DEP), the discount rate (DISC_RATE), the benefit levels (BENEFIT), the future salary (SALARY_FUTURE) and the future medical costs (MEDICAL_COSTS).³⁵

Concerning the methods to assess the disclosure level, Artiach and Clarkson (2011) find that there are two ways to assess disclosure quality; the first is to use a self-developed coding method (Wiseman 1982; Botosan 1997; Clarkson 2006) and the second is to use external ratings published by authority organizations (e.g. the Association for Investment Management and Research reports). As the evaluation of DAS is a specific research object, it is not possible to use external ratings, and, therefore, this study adopts the self-conducted coding method. Wiseman (1982) develops an index to assess the disclosure quality of environmental information. My coding method is based on her method.

Wiseman (1982) assesses the disclosure quality of each item using the following three criteria: (i) whether the item has been disclosed, (ii) is there a qualitative disclosure, and, (iii) is there a quantitative disclosure. An item will be scored 3 if the firm has disclosed the item, disclosed qualitative information and disclosed quantitative information. Moreover, a score of 2 will be obtained by an item if it has specific disclosure of the firm but without quantitative disclosure; an item will

³⁵ The claim rates and taxes payable are not included in formula 1 as nearly no firms included in the sample mentioned those items in their financial reports.

be score 1 if it is only generally disclosed, and if an item has not been disclosed at all, it will be scored as 0.

In addition to the qualitative and quantitative disclosures, this dissertation also includes the sensitivity disclosure to evaluate the DAS. IAS 19R (para. 145a) requires entities at the end of each reporting period to report a sensitivity analysis of actuarial assumptions, “*showing how the defined benefit obligation would have been affected by changes in relevant actuarial assumption that were reasonably possible at that date*”. According to the annual report of Volkswagen in 2013 (pp. 238), a 1%-point decrease in discount rate will result in an increase of 4607 million Euros of defined benefit obligation.

Thus, based on the definition of DAS and Wiseman’s index (1982), I scored the disclosures of actuarial assumptions according to three criteria: whether the actuarial assumption has a textual description, quantitative description and sensitivity analysis. Each criterion scores 1, and the maximum disclosure score of an actuarial assumption is 3 (i.e. the actuarial assumption has a textual description (Text_D), quantitative description (Quanti_D) and sensitivity analysis (Sensiti_D)), while the minimum score is 0 (i.e. the actuarial assumption has not been disclosed).

The disclosure level of each actuarial assumption equals its disclosure score divided by three (e.g. the disclosure level of discount rate (DISC_RATE) = (Text_D + Quanti_D + Sensiti_D)/ 3).

Table 9 is an example of scoring the disclosure level of discount rate. It can be seen from the table that a firm’s disclosure level of discount rate is dependent on whether the firm has textual description, quantitative description and sensitivity disclosure of discount rate. The highest disclosure level of discount rate could be 1 (i.e. Firm A) which means the firm has all the three kinds of description, while the lowest disclosure level of discount rate is 0 (i.e. Firm C) which means the firm does not disclose the discount rate.

Table 9. The scoring role of each item of the actuarial assumptions - An example of the Discount rate

	Textual description	Quantitative description	Sensitivity analysis	Total disclosure score	Disclosure level of discount rate (DISC_RATE)
Firm A	1	1	1	3	1
Firm B	1	0	0	1	1/3
Firm C	0	0	0	0	0
Firm D	0	1	1	2	2/3

Table 10 shows an example of assessing the disclosure level of actuarial assumptions for Firm A. As stated in Table 8, the disclosure level of each actuarial assumption has been assessed by textual description, quantitative description and sensitivity disclosure. Moreover, Firm A's disclosure level of actuarial assumptions (i.e. DAS) equals the sum of scores of each actuarial assumption's disclosure level divided by the number of actuarial assumptions (i.e. $DAS = (1 + 1 + 0.33 + 0.33 + 0.33 + 0.33 + 0.33 + 0.33 + 0.67) / 9 = 0.52$), as well as the sum of all actuarial assumptions' scores of textual description, quantitative description and sensitivity disclosure divided by 27 (i.e. $DAS = (6 + 6 + 4) / 27 = 0.52$).

Table 10. The assessment of the DAS - An example of Firm A

Items	Textual description	Quantitative description	Sensitivity disclosure	Total	Disclosure level of each actuarial assumption
Mortality	1	1	1	3	1
Employee turnover	1	1	1	3	1
Disabled employee Benefits	1	1	1	1	0.33
Early retirement	1	0	0	1	0.33
Dependents' benefit	1	0	0	1	0.33
Discount rate	1	0	0	1	0.33
Benefit level	0	1	0	1	0.33
Future salary	0	1	0	1	0.33
Medical costs	0	1	1	2	0.67
Total	6	6	4	14	0.52
The disclosure level of textual description			Total textual description = 6		
The disclosure level of quantitative description			Total quantitative description = 6		
The disclosure level of sensitivity disclosure			Total sensitivity disclosure = 4		
The disclosure level of actuarial assumptions (DAS)			$\frac{(\text{Text_D} + \text{Quanti_D} + \text{Sensiti_D})}{3}$ $= \frac{(\text{Mortality} + \text{Employee turnover} + \text{Disabled employee benefits} + \text{Early retirement} + \text{Dependents' benefit} + \text{Discount rate} + \text{Benefit level} + \text{Future salary} + \text{Medical costs})}{27} = 0.52$		

5.3.2 Test and control variables

The following equation is used to test Hypotheses 1 to 5:

$$\begin{aligned}
 \mathbf{DAS}_i / \Delta \mathbf{DAS}_i = & \beta_0 + \beta_1 \mathbf{IAS19R} + \beta_2 \mathbf{L_AF}_i + \beta_3 \mathbf{FO}_i + \beta_4 \mathbf{PFS}_i + \beta_5 \mathbf{SIZE}_i + \\
 & \beta_6 \mathbf{Country} + \beta_7 \mathbf{Industry} + \varepsilon
 \end{aligned}
 \tag{2}$$

Ordinary least square (OLS) regressions are used to estimate the models. \mathbf{DAS}_i is a company's disclosure of actuarial assumptions in year i . The items included in the model are described in section 5.3.1 and in the Appendix. In addition, the textual disclosure ($\mathbf{Text_D}$), quantitative disclosure ($\mathbf{Quanti_D}$) and sensitivity disclosure ($\mathbf{Sensiti_D}$) are also employed as dependent variables in order to provide a more detailed analysis of how disclosures are related to the test variables.

Hypothesis 1 predicts that the adoption of IAS 19R influences the disclosure level. The variable **IAS 19R** assumes the value 1 under IAS 19R and the value 0 under IAS 19. Therefore, a positive coefficient would suggest firms disclose more under IAS 19R.

Hypothesis 2 predicts that the adoption of the IAS 19R impedes the comparability of disclosure level among companies. $\Delta \mathbf{DAS}_i$ stands for the comparability of a firm's disclosure of actuarial assumptions in year i . Three methods are employed to measure the comparability of disclosure level: the comparison of the standard deviation of DAS under the IAS 19 and IAS 19R, the comparison of difference between one firm's DAS and the average of all firms' DAS under the IAS 19 and IAS 19R, and the estimated residuals of DAS under the IAS 19 and IAS 19R.

Hypothesis 3 predicts a positive association between analyst following and DAS. The $\mathbf{L_AF}_i$ means the logarithm of the number of analysts following the company in year i , $\mathbf{L_AF}$ is obtained from the database Datastream.

Hypothesis 4 predicts a positive association between foreign ownership and DAS. The variable \mathbf{FO}_i measures the foreign ownership in year i . FO is measured as the percentage of shares controlled by foreign investors and the data are also obtained from the database Datastream.

Hypothesis 5 predicts a negative relationship between pension funded status and DAS. The \mathbf{PFS}_i stands for the pension funded status in year i . Following Bauman and Shaw (2014), this study defines the pension funded status as equaling the plan assets divided by the defined benefit obligation (i.e. $\mathbf{PFS} = \mathbf{PA/DBO}$).

I include the following control variables in the regressions:

The firm size is considered to have an effect on the disclosure level (Cerf 1961; Buzby 1975; McNally *et al.* 1982; Wallace *et al.* 1994; Inchausti 1997; Ahmed and Courtis 1999). For example, Ahmed and Courtis (1999) investigate 29 studies that examine the association between corporate characteristics and disclosure using the meta-analysis method and they claim that there is a positive relationship between the company size and the disclosure quality. Hence, this research also includes the company size (**Size**) to assess the firm size. Size is measured as the logarithm of total assets (**TA_**) in the main analyses. It is replaced by the logarithm of the number of employees (**NE_**) in the robustness check.

According to Glaum *et al.* (2013), country-specific factors and accounting traditions significantly affect the compliance level of European firms that adopt the IFRS mandatorily. Hence, country is included as one of the control variables when assessing the disclosure level. **Country** examines whether different countries have an effect on the disclosure and the comparability of DAS. Since my sample includes four countries (i.e. Germany, France, Italy and Sweden), three indicator variables are presented in the regressions. For example, if Germany is excluded, a positive (negative) coefficient on a country variable means that firms in that country have a higher (lower) disclosure level than German firms.

Previous studies report mixed evidence on the association between industry and disclosure level. Cooke (1989) finds a positive relationship between manufacturing firms and disclosure amount. However, this relationship is not supported by findings of Inchausti (1997) as well as Akhtaruddin (2005). Furthermore, Glaum *et al.* (2013) point out that the firms in the field of financial services tend to have a higher compliance level on the disclosure of goodwill than firms from other sectors. Thus, this dissertation includes industry as a control variable. **Industry** investigates the effects of different industries (i.e. Chemistry, Machinery, Other service, Other industries in the field of Tertiary sector and Other industries in the field of Primary and Secondary sector) on the DAS and comparability of the DAS. Since Industry includes five fields, four indicator variables are included.

5.4 Empirical models for the corridor method

This section demonstrates the empirical models for the corridor method, which can be divided into three parts: Hypothesis 6 (i.e. the relationship between leverage and corridor method users), Hypothesis 7 (i.e. the relationship between ownership concentration and corridor method users) and Hypothesis 8 (i.e. the relationship between ownership structure and non-compliance disclosure about

corridor method). Each part will begin with model building and then show the explanation of test variables and control variables.

5.4.1 Model for the determinants of using the corridor method

The corridor method is one of the options to recognize the actuarial gains and losses under the IAS 19 (version 2004), which allows conditional off-balance sheet recognition³⁶ of pension liabilities and assets. However, the IAS 19R removes the corridor method, and thus the corridor method users may be affected more by the application of IAS 19R than non-corridor method users. In order to find out the determinants of corridor method users, the following model is build based on Morais' (2010):

$$CM = \beta_0 + \beta_1 LEV + \beta_2 OC + \beta_3 Large + \beta_4 AGL_R + \beta_5 ROE + \beta_6 PM + \beta_7 SIZE + \beta_8 Country + \beta_9 Industry \quad (3)$$

Logistic regressions are used to estimate the model. **CM** stands for the use of the corridor method; it equals 1 if the company used the corridor method prior to the adoption of IAS 19R and 0 if company had fully recognized the actuarial gains and losses either through the other comprehensive income or the profit and losses.

Hypothesis 6 predicts a positive relationship between leverage and the corridor method users. The variable **LEV** means the leverage ratio which equals total debt divided by total assets. Moreover, **PLEV** is measured as the liabilities divided by equity has been used in robustness check.

Hypothesis 7 predicts a negative association between the ownership concentration and the use of the corridor method. **OC** and **Large** are included as the test variables. **OC** means the ownership structure measured as the greater of: a) the largest ownership of the entity to its direct ownership; and b) the largest ownership of the entity to its total ownership. **Large** means the proportion of shares owned by the largest owner.

³⁶ If the net cumulative unrecognized actuarial gains and losses were not greater than 10% of the defined benefit obligation and 10% of the fair value of any plan assets.

The following control variables are included in the regression:

The corridor method allows conditional off-balance sheet recognition of actuarial gains and losses. The removal of the corridor method therefore affects the amounts of actuarial gains and losses that a firm will recognize. Moreover, according to Morais (2010), the actuarial gains and losses are one of the significant determinants of using the corridor method. Thus, actuarial gains and losses should be taken into account, and in order to avoid the effects of firm size on it, the **AGL_R** is included in the model, which is calculated as the difference between actuarial gains and actuarial losses divided by total assets (i.e. (actuarial gains-actuarial losses)/total assets).

According to Morais (2010), the profitability is one of the important determinants of using the corridor method. Thus, **ROE** (the Rate of Return on Common Stockholders' Equity, which is calculated as the profit or loss before tax divided by equity) and **PM** (profit margin) are employed to assess the profitability of firms. In addition, the **ROEN**, which is calculated as net income after tax divided by equity, is used instead of ROE in robustness checks. Additionally, **OR_A**, which is calculated as the firm's operating revenue divided by the total assets to avoid the influences of firm size, is employed as the proxy of PM in the robustness check.

The **SIZE** means the size of firm, which is commonly measured as the total assets of a firm, and many scholars find the firm's size significantly affects the accounting policy choice (e.g. Morais 2010; Waweru et al. 2011; Langer and Lev 1993). The **TA_** is used to measure the firm size, and the **NE_** is employed as proxy of **TA_** in the robustness check. Both of them have been introduced in section 5.3.2 and can be found in the Appendix.

In addition, **Country** and **Industry** have been included as control variables, and their definitions can be found in the Appendix.

5.4.2 Model for the non-compliance disclosure about corridor method

The IAS 19R (para. 173) requires entities to apply IAS 19R retrospectively. Thus, firms employing the corridor method prior to the IAS 19R have to adjust the equity in the balance sheet for the year prior to the transition as though the company would have always applied IAS 19R. This adjustment is made in the comparative information (i.e. information for 2012 in the financial statements for 2013, if IAS 19R was adopted in 2013). Therefore, when a firm does not report information retrospectively after adopting the IAS 19R, it is considered to have non-compliance disclosures. This section formulates the following model for analyzing non-

compliance disclosures, which relates to Hypothesis 8 and is based on models from Tsalavoutas (2011), Bova and Pereira (2012) and Glaum et al. (2013).

$$\text{Compliance_D} = \beta_0 + \beta_1 \text{OC} + \beta_2 \text{Large} + \beta_3 \text{Size} + \beta_4 \text{LEV} + \beta_5 \text{Profitability} + \beta_6 \text{Industry} + \beta_7 \text{Culture} \quad (4)$$

Compliance_D stands for the compliance with the rule to restate, which equals 1 if a firm has restated its comparative information, otherwise it equals 0.

Hypothesis 8 predicts that the ownership structure affects the compliance of disclosure regarding the corridor method. **OC** and **Large** are included as the test variables, both of which have been explained in section 5.4.1.

Previous research (Ball et al. 2000; Hope 2003b; Bushman et al. 2004; Francis and Wang 2008) has identified two different level determinants in explaining IFRS compliance: company-level determinants (e.g. firm size, industry, gearing, profitability) and country-level determinants (e.g. culture). This dissertation follows the previous classification of determinants to study the compliance of comparative disclosure concerning corridor method, and includes following control variables:

Concerning the company-level determinants, the following variables are considered as control variables:

The **SIZE** means firm size; it is one of the determinants that has been taken into consideration when assessing the compliance level of disclosure. According to Glaum et al. (2013), compared to smaller firms, big firms have more resources for the accounting department and hence have higher-quality financial reporting. This dissertation uses **TA_** and **NE_** to assess the firm size, and the definition of these variables can be found in section 5.3.2 and the Appendix.

Even though previous studies (Ali et al. 2004; Akhtaruddin 2005) find a mixed relationship between compliance and gearing, this dissertation will follow Tsalavoutas (2011) and include gearing as a control variable. I use **LEV**, calculated as total debts divided by total assets, as the measure. The **PLEV** is used in the robustness check, which can be found in the Appendix.

The **Profitability** has been considered as related to IFRS compliance (Cascino and Gassen 2015). Thus, the ROE will be included as a control variable when

assessing firms' compliance and ROEN will be used in the robustness check. The definitions of ROE and ROEN can be found in section 5.4.1 and the Appendix.

Firms from different industries have different disclosure practices (Ahmed and Courtis 1999), while firms within the same industry increase their disclosure level in comparability after adopting the IFRS (Di Maggio and Powell 1983). This dissertation includes firms from different industries; thus **Industry** is included as a control variable and has been explained in the Appendix.

On the country level, **Culture** will be included. Scholars (e.g. Street and Bryant 2000) find significant country effects when studying the compliance, and many of them (e.g. Salter and Niswander 1995) claim culture is the key to explaining the accounting differences. Gray (1988) first associates a country's international level of accounting system to its culture values and other environmental factors. Furthermore, Salter and Niswander (1995) claim that culture can be used to analyze the different accounting practices, especially disclosures among different countries. Moreover, Ding et al. (2005) find cultural differences are the main reason for the differences between national accounting rules and IFRS. Thus, Country and Culture will be included as control variables when assessing the compliance of comparative disclosures regarding the corridor method. This dissertation follows Hope et al. (2008) and assesses culture using secrecy (SECRECY) which equals the scores of Uncertainty Avoidance (UA) plus scores of Power Distance (PD) less scores of individuals (IND). Moreover, the values of uncertainty avoidance, power distance and individuals are taken from Hofstede et al. (2008) and <http://geert-hofstede.com/> (retrieved May 2013).

5.5 Empirical models for the effects of adopting the IAS 19R

This section builds models for the effects of adopting IAS 19R. More specifically, it builds models for Hypotheses 9-12 that examine corridor method users' reaction to the removing of corridor method. The following models are built to test Hypotheses 9-12:

$$DR_i = \beta_0 + \beta_1 CM + \beta_2 IAS19R + \beta_3 CM * IAS19R + \beta_4 LEV + \beta_5 SIZE + \beta_6 ROE + \beta_7 Country + \beta_8 Industry \quad (5)$$

$$DP_{i-R} = \beta_0 + \beta_1 CM + \beta_2 IAS19R + \beta_3 CM * IAS19R + \beta_4 LEV + \beta_5 SIZE + \beta_6 ROE + \beta_7 Growth + \beta_8 Country + \beta_9 Industry \quad (6)$$

$$LEV_i = \beta_0 + \beta_1 CM + \beta_2 IAS19R + \beta_3 CM * IAS19R + \beta_4 PM + \beta_5 SIZE + \beta_6 ROE + \beta_7 Growth + \beta_8 Country + \beta_9 Industry \quad (7)$$

$$EA = \beta_0 + \beta_1 CM + \beta_2 DAS + \beta_3 Compliance_D + \beta_4 LEV + \beta_5 SIZE + \beta_6 ROE + \beta_7 Country + \beta_8 Industry \quad (8)$$

DR_i stands for the discount rate of a firm in year *i*; **DP_i_R** means the dividend payment of a firm in year *i* divided by the firm's revenue (i.e. in order to avoid the effects of firm size on dividend payment); **LEV_i** is the leverage of a firm in year *i* which equals total debts divided by total assets; **EA** examines whether a firm adopts the IAS 19R early, it equals 1 if the firm is an early adopter, otherwise it equals 0. Nevertheless, the EA is different from the other three dependent variables: the EA is a variable that only focuses on one year, it assesses whether a firm adopts the IAS 19R before the time it has to be "put into use" (i.e. the year 2013); while the other three variables cannot be examined correctly without a longer period. Thus, only 1-year data (i.e. in the year the 200 firms first adopted the IAS 19R) is employed to study Hypothesis 12, while an 8-year panel with data from 2008 to 2015 is used to investigate Hypotheses 9-11. In addition, all financial ratios have been winsorized at the 1% level.

In order to analyze the influences of removing the corridor method, the difference in difference approach is used for Hypotheses 9-11 (i.e. the effects of removing the corridor method for corridor method users on DR, DP_R and LEV). The difference in difference method, however, is a method that separates the sample into two groups: the treatment group and control group. Moreover, the two groups are compared in the pre- and post-period. The method is used to find out the influences of the treatment group between periods, and the included of control group can avoid the bias from special classes of omitted variables. Furthermore, the sample for the difference in difference model is formulated as:

$$Y_{Gt} = \beta_0 + \beta_1 Treat_G + \beta_2 Post_t + \beta_3 (Treat_G * Post_t) + \varepsilon_{Gt}$$

The Y_{Gt} is the result in group *G* and period *t*; $Treat_G$ measures whether the data are from the treatment group, and it equals 1 if the data are from the treatment group, it equals 0 otherwise; $Post_t$ examines whether the data are from the post period, it equals 1 if it is from the post period, it equals 0 otherwise; $Treat_G * Post_t$ is the difference in difference interaction, which measures the treatment group in post periods; β_3 is of special interest, which is the estimate of the treatment effect.

Applied to Hypotheses 9-11, the treatment group includes corridor method users, and the control group includes non-corridor method users, thus, the variable Corridor method users (CM) is used as “Treatment”. Moreover, the years before the adoption of IAS 19R is the pre-period, while the years after (and include) the adoption of the IAS 19R is the post-period; thus, the IAS 19R (IAS 19R) is used as “Post”.

In order to examine the early adoption of the IAS 19R, I build the model 8 based on Bujaki and McConomy (2007) who study the early adoption of an income tax accounting policy³⁷. However, the IAS 19R is an accounting policy for employee benefits, therefore the income tax policy-related variables are replaced by DAS and the Compliance_D in model 8.

Hypothesis 9 predicts that the removal of the corridor method changes the discount rate of corridor method users. The **CM** examines whether the firm used the corridor method before, and has been described in section 5.4.2.2 and the Appendix. The **IAS 19R** examines whether firms use the IAS 19R, it equals 1 if it is the year that already adopts/uses the IAS 19R, otherwise it equals 0. The **CM*IAS 19R** is the difference in difference interaction, which is of special interest. It examines the effect of IAS 19R on the discount rate for corridor method users.

Hypothesis 10 predicts that the removal of the corridor method decreases the dividend payment of corridor method users. Moreover, Hypothesis 11 predicts that the removal of the corridor method increases the leverage of corridor method users. Furthermore, Hypothesis 12 predicts that the corridor method users are less likely to early adopt the IAS 19R, as the IAS 19R abolishes the corridor method.

The following control variables are included in model with early adoption (**EA**) as the dependent variable:

The **DAS** and the **Compliance_D** are the disclosure levels of the actuarial assumptions (which can be found in section 5.3.1) and the compliance disclosure regarding the corridor method (which can be found in section 5.4.2.2) separately. They are included following the model of Bujaki and McConomy (2007). Moreover, the results of Bujaki and McConomy (2007) claim that the related disclosures (i.e. the retroactive adjustment and the disclosures regarding the corporate governance practices) have a significantly positive influence on the early adoption of income tax principle.

³⁷ The Income Taxes Standard was a Canadian accounting policy which was issued by the Accounting Standards Board in December 1997 and put into use since the fiscal year of 2000.

The **LEV** is the leverage, which is calculated as the total debts divided by the total assets (Total debts/Total assets). It is included as a control variable as many scholars (Feldstein and Morck 1983; Fried 2012) find the leverage affects the choice of accounting method. Furthermore, DeAngelo et al. (2006) claim a positive influence of leverage on the dividend payment. In addition, many scholars find the firm leverage (**LEV**) has significant effects on the time of adopting the accounting rules (e.g. Bujaki and McConomy 2007). Moreover, the **PLEV** is used in the robustness check, and it has been described in section 5.4.1 and the Appendix.

The **SIZE** is the firm size, which is calculated as the logarithm of total assets (**TA_**) and is replaced by the logarithm of number of employees (**NE_**) in the robustness check. According Fried and Davis-Friday (2013), firms with a bigger size may face greater regulatory scrutiny, thus they will have incentives to increase the discount rate. Their results further support the opinion that the firm size positively influences the discount rate. Moreover, DeAngelo et al. (2006) find a positive relationship between the firm size and the dividend payment. In addition, Cassar and Holmes (2003) find a positive relationship between the firm size and the leverage. In addition, it has been supported by research that the firm size affects the time of using accounting rules (e.g. Bujaki and McConomy 2007). Hence, size is included as a control variable for the discount rate, dividend payment, leverage and early adoption of IAS 19R.

The **ROE** is the Rate of Return on Common Stockholders' Equity, which is obtained from the Obis database and has been introduced in section 5.4.1. It is used to measure the profitability of firms. Furthermore, many scholars agree that the profitability of a firm affects its discount rate (e.g. Fried and Davis-Friday 2013), dividend payment (e.g. Deangelo et al. 2006), leverage (Jordan et al. 1998) and the time of adopting the accounting rules (e.g. Li and McConomy 1999). Moreover, the **ROEN** (i.e. the proxy of ROE, which can be found in section 5.4.1 and the Appendix) is used in the robustness check to replace it. In addition, I further use **PM** (profit margin) when assessing the leverage and use the **OR_A** as the proxy of PM in the robustness check. Both the PM and OR_A have been introduced in section 5.4.1 and the Appendix.

The **Growth** measures the firm growth in sales, which is calculated as the firm's operating revenue divided by its total assets to avoid the influences of firm size. According to Cassar and Holmes (2003), growing firms have a higher demand to generate funds, and thus will have influence on the leverage. Moreover, DeAngelo et al. (2006) claim a highly significant relationship between the firm growth and the dividend payment.

Moreover, **Industry** and **Country** have been included as control variables to see whether different industries and countries affect the DR, DP_R, LEV and EA; their definitions have been described in the Appendix.

6 EMPIRICAL RESULTS

This chapter illustrates the measurements and results of the three research questions: the relationship between the adoption of IAS 19R and DAS; the determinants of using the corridor method and the effects of adopting the IAS 19R. Each research question has been further discussed in chapter 4 and I ended up with 12 hypotheses. Moreover, chapter 5 builds eight models and this chapter concludes by showing the empirical results in three parts: 6.1 introduces the tests for DAS (i.e. H1, H2, H3, H4 and H5), 6.2 describes the results of the tests regarding the corridor method (i.e. H6, H7 and H8), and 6.3 shows the examinations of the effects of adopting the IAS 19R (i.e. H9-H12).

6.1 Determinants and comparability of disclosures

This part shows the empirical results for the tests regarding DAS. More specifically, this section shows the results of the determinants of DAS (i.e. Hypotheses 1, 3, 4 and 5), the effects of IAS 19R on the comparability of DAS (i.e. Hypothesis 2) and the additional tests concerning DAS (i.e. examinations of interaction effects and culture effects on DAS). Each part will begin with a presentation of descriptive statistics to provide a general overview of the data. This is followed by regressions with tests of the hypotheses, and, finally, the conclusions are presented.

6.1.1 Determinants of DAS

This part presents the results for determinants of DAS, which primarily focus on the relationship between the adoption of the IAS 19R and DAS (Hypothesis 1), the association between analysts following and DAS (Hypothesis 3), the effects of foreign ownership on DAS (Hypothesis 4) and the relationship between pension funded status and DAS (Hypothesis 5). In the following sections, I present univariate and multivariate tests for these hypotheses.

6.1.1.1 Univariate results

Table 11 presents the descriptive analysis of the regression variables for Hypotheses 1, 3, 4 and 5, in which Panel A examines the dependent variables (i.e. DAS, Text_D, Quanti_D and Sensiti_D) while Panel B investigates the test variables (i.e. FO, L_AF and PFS).

Panel A compares the mean value of DAS, the textual description of actuarial assumptions (Text_D), the quantitative description of actuarial assumptions (Quanti_D) and the sensitivity analysis of actuarial assumptions (Sensiti_D) before and after the adoption of the IAS 19R. The table shows that the mean value of DAS, Text_D and Sensiti_D under IAS 19R are significantly higher than under IAS 19. However, the difference between the mean value of Quanti_D under the IAS 19 and IAS 19R is not significant. Hence, the adoption of IAS 19R affects the mean value of DAS, Text_D and Sensiti_D, but it does not have an effect on the mean value of Quanti_D. Thus, the univariate results in Panel A show that the adoption of IAS 19R increases the mean value of DAS.

Panel B makes a comparison among test variables (i.e. the AF, FO and PFS). More specifically, each test variable has been divided into two parts according to its mean value. For example, the AF has been divided into: observations equal to or over the mean value of AF (i.e. observations with more AF) and observations under the mean value of AF (i.e. observations with less AF). The comparison of AF is made between the effects of its two classifications on DAS, Text_D, Quanti_D and Sensiti_D. It can be seen that the mean value of DAS, Text_D, Quanti_D and Sensiti_D for observations with less AF/FO/PFS is significantly lower than observations with more AF/FO/PFS. Thus, the results demonstrate that observations with more AF, FO and PFS tend to have higher DAS, Text_D, Quanti_D and Sensiti_D. This result supports the Hypotheses 3 and 4 while rejecting Hypothesis 5.

Table 11. Descriptive statistics

Panel A. Comparison of dependent variables

Variables	Observations		Observations under		Mean Diff
	under IAS 19	Mean	IAS 19R	Mean	
DAS	200	0.263	200	0.305	-0.042***
Text_D	200	0.429	200	0.464	-0.035*
Quanti_D	200	0.34	200	0.358	-0.018
Sensiti_D	200	0.021	200	0.092	-0.072***

Note: A two-sample t test is used to examine the difference between the dependent variables under IAS 19 and IAS 19R ***Significant level at 0.01 (2-tailed), **Significant level at 0.5 (2-tailed), * Significant level at 0.1 (2-tailed).

Table 11. Continued**Panel B.** Comparison of test variables

L_AF					
Variables	Observations with less L_AF	Mean	Observations with more L_AF	Mean	Mean Diff
DAS	180	0.249	220	0.313	-0.065***
Text_D	180	0.386	220	0.497	-0.111***
Quanti_D	180	0.319	220	0.374	-0.056***
Sensiti_D	180	0.041	220	0.069	-0.027***
FO					
Variables	Observations with less FO	Mean	Observations with more FO	Mean	Mean Diff
DAS	252	0.256	148	0.332	-0.075***
Text_D	252	0.407	148	0.516	-0.109***
Quanti_D	252	0.317	148	0.405	-0.088***
Sensiti_D	252	0.046	148	0.074	-0.028***
PFS					
Variables	Observations with less PFS	Mean	Observations with more PFS	Mean	Mean Diff
DAS	225	0.248	175	0.331	-0.083***
Text_D	225	0.392	175	0.517	-0.125***
Quanti_D	225	0.31	175	0.399	-0.089***
Sensiti_D	225	0.041	175	0.076	-0.035***

Note: The table includes 400 observations from 200 companies (i.e. the data are collected in the year of firms adopting IAS 19R and one year previously) with 50 firms each from Sweden, Italy, Germany and France. The **L_AF** means the logarithm of analyst following; the **PFS** means the pension funded status which has been winsorized at 1% level; the **FO** means the foreign ownership; the **DAS** means the disclosure level of actuarial assumptions; the **Sensiti_D** means the sensitivity disclosure of actuarial assumptions; the **Text_D** means the textual disclosure of actuarial assumptions; the **Quanti_D** means the quantitative disclosure of actuarial assumptions; the observations with less L_AF/FO/PFS are the observations have the under mean value L_AF/FO/PFS, otherwise they are considered to be observations with more L_AF/FO/PFS.

6.1.1.2 Regression results

Ordinary least square regressions are employed to examine the determinants of DAS, Text_D, Quanti_D and Sensiti_D, and the results are shown in Table 12. Hypothesis 1 predicts a relationship between DAS and the adoption of the IAS 19R. It can be seen from the results that IAS 19R has a positive coefficient significant at the 0.01 level, which claims that the adoption of IAS 19R improves the DAS.

Furthermore, the results of Table 12 reject Hypothesis 3 by showing no significant relationship between L_AF and DAS. However, when the firm size is measured by the logarithm of number of employees in the robustness check (i.e. Table 13), the results support Hypothesis 3, which predicts that firms with more analysts tend to have higher DAS. Thus, the firm size affects the relationship between analysts and DAS. Moreover, the firm size is found to have significantly positive effects on DAS at the level of 0.01.

In addition, Hypothesis 4 expects a positive association between foreign ownership and DAS. It can be seen from the results that foreign ownership has significantly positive effects on DAS, which supports Hypothesis 4 and claims that firms with more foreign ownership tend to have higher DAS. A possible reason for this positive relationship could be due to the reducing information asymmetry, which is in line with Oxelheim and Randoy (2003): firms tend to improve their disclosure level in order to attract/keep foreign ownership.

Moreover, Hypothesis 5 predicts a negative relationship between pension funded status and DAS. Even though the results of Table 11 show that when observations are divided into ones with higher pension funded status and ones with lower pension funded status (i.e. according to the mean value of all observations' funded status), the DAS of the higher ones is significantly higher than the lower ones. The results of OLS regressions reveal that the coefficient on pension funded status is not significant, and thus rejects Hypothesis 5 and suggests that the level of pension funded status does not have a noticeable effect on DAS. In addition, Bauman and Shaw (2014) claim that the past 10 years' pension funded status affects firms' decision on having sensitivity disclosure of actuarial assumptions: the average of pension funded status has positive effects while the variability of pension funded status has negative effects on disclosing sensitivity information about actuarial assumptions. Since this dissertation is focused on the data in the year of adopting IAS 19R and one year previously, a possible reason for the different results of the effects of pension funded status on DAS may be due to the different research periods.

Further observations can be found among countries and industries. Compared with firms from Germany, firms from France, Italy and Sweden have negative and significant effects (at 0.01 level) on DAS. Moreover, compared with firms in the field of Chemical, firms in all other fields have negative and significant effects on DAS. Thus, firms from Germany and firms in the field of Chemical are more likely to have higher DAS.

Additionally, Table 12 clarifies the determinants of Text_D, Quanti_D and Sensiti_D. It can be seen that the adoption of the IAS 19R, the number of analysts following and the percentage of foreign ownership positively affects the textual disclosure level of actuarial assumptions at the level of 0.1, 0.05 and 0.05 separately. Moreover, the percentage of foreign ownership positively (at 0.05 level) affects the quantitative disclosure level of actuarial assumptions. Furthermore, the adoption of the IAS 19R has significantly positive effects on the sensitivity disclosure level of actuarial assumptions at the level of 0.01. Additionally, the firm size has positive effects on all of the three variables (i.e. Text_D, Quanti_D and Sensiti_D).

Table 12. The determinants on DAS, Text_D, Quanti_D and Sensiti_D

VARIABLES	m1 DAS	m2 Text_D	m3 Quanti_D	m4 Sensiti_D
IAS 19R	0.0379*** (4.097)	0.0292* (1.699)	0.0146 (0.985)	0.0700*** (7.697)
L_AF	0.0108 (1.536)	0.0249** (2.144)	0.00877 (0.747)	-0.0012 (-0.179)
FO	0.0706*** (2.727)	0.105** (2.309)	0.102** (2.351)	0.00423 (0.154)
PFS	0.0235 (1.408)	0.0238 (0.777)	0.0360 (1.222)	0.0106 (0.676)
TA_	0.0209*** (5.154)	0.0329*** (4.649)	0.0169** (2.522)	0.0130*** (3.093)
O. Germany	-	-	-	-
France	-0.0645*** (-4.461)	-0.00269 (-0.113)	-0.104*** (-4.749)	-0.0870*** (-5.664)
Italy	-0.157*** (-10.33)	-0.187*** (-6.341)	-0.193*** (-8.338)	-0.0924*** (-6.178)

Table 12. Continued

VARIABLES	m1 DAS	m2 Text_D	m3 Quanti_D	m4 Sensiti_D
Sweden	-0.0912*** (-5.626)	-0.144*** (-5.070)	-0.0859*** (-3.564)	-0.0441*** (-2.719)
O. Chemical	-	-	-	-
Other service	-0.0365** (-1.989)	-0.0228 (-0.704)	-0.0763*** (-2.732)	-0.0103 (-0.539)
Machinery	-0.0452*** (-2.802)	-0.0236 (-0.737)	-0.0746*** (-3.061)	-0.0375** (-2.153)
Other_Psector	-0.0574*** (-3.391)	-0.0346 (-1.022)	-0.111*** (-4.067)	-0.0270 (-1.387)
Other_Tertiary sectors	-0.0605*** (-3.607)	-0.0514 (-1.600)	-0.0827*** (-2.905)	-0.0473*** (-2.755)
Constant	0.198*** (8.099)	0.241*** (5.012)	0.344*** (8.796)	0.00791 (0.300)
Observations	363	363	363	363
R squared	0.503	0.406	0.325	0.311

Robust z-statistics in parentheses

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

This table shows the OLS regression results examining the determinants of the disclosure level of actuarial assumptions (**DAS**), the textual disclosure (**Text_D**), the quantitative disclosure (**Quanti_D**) and the sensitivity disclosure (**Sensiti_D**). The observation includes 363 annual reports from 200 listed European firms in the year the companies first adopted the IAS 19R and one year previously. The **IAS 19R** equals 1 if the firm adopted the IAS 19R, otherwise, it equals 0; the **L_AF** stands for the logarithm of analyst following; the **PFS** stands for the firm's pension funded status, it equals the pension assets divided by the defined benefit obligation (i.e. PFS = PA/DBO), which has been winsorized at 1% level; the **FO** stands for the foreign ownership; the **TA_** means the logarithm of total assets, which has been winsorized at 1% level; the **NE** stands for the logarithm of number of employees; **Machinery** examines whether the firm is in the field of Machinery; **Other_Psector** examines whether the firm is in the field of Other industries in the Primary and Secondary sectors; **Other_Tertiary** sectors examines whether the firm is in the field of Other industries in Tertiary sectors; **Other service** examines whether the firm is in the field of other service; **Chemical** examines whether the firm is in the field of Chemistry.

Table 13 shows the robustness check for the determinants of DAS, Text_D, Quanti_D and Sensiti_D. More specifically, the firm size is measured as the logarithm of number of employees rather than the logarithm of total assets.

After the replacement, the analysts following begins to have positive and significant (i.e. at the level of 0.1) effects on the DAS, which supports Hypothesis 4 and validates the opinion that the number of analysts has a positive influence on the disclosure level (e.g. Dhaliwal et al. 2011; Gao, Dong, Ni and Fu 2015; Botosan and Harris 2000). Hence, different measures of firm size affect the effects of analyst following on DAS.

However, the adoption of IAS 19R and the percentage of foreign ownership continues to have positive and significant effects on the DAS, while the coefficient of pension funded status is still not significant.

Thus, the robustness check strongly suggests that the adoption of IAS 19R increases the DAS; moreover it also suggests that firms with more foreign ownership or analyst following tend to have higher DAS.

In addition, the adoption of IAS 19R continues to have positive effects on Sensiti_D, as well as the positive effects of the percentage of foreign ownership on Text_D and Quanti_D. Moreover, the number of analysts still positively affects the Text_D. However, the adoption of IAS 19R does not have a significant effect on Text_D in the robustness check.

Table 13. The robustness check for the determinants of DAS, Text_D, Quanti_D and Sensiti_D

	m1	m2	m3	m4
VARIABLES	DAS	Text_D	Quanti_D	Sensiti_D
IAS 19R	0.0372*** (4.007)	0.0281 (1.632)	0.0135 (0.915)	0.0698*** (7.596)
L_AF	0.0159** (2.512)	0.0347*** (3.255)	0.00784 (0.725)	0.00525 (0.839)
FO	0.0748*** (2.807)	0.112** (2.473)	0.105** (2.397)	0.00736 (0.261)
PFS	0.0212 (1.314)	0.0217 (0.729)	0.0298 (1.027)	0.0120 (0.748)

Table 13. Continued

	m1	m2	m3	m4
VARIABLES	DAS	Text_D	Quanti_D	Sensiti_D
NE_	0.0203*** (5.007)	0.0300*** (4.584)	0.0217*** (3.338)	0.00910** (2.128)
O. Germany	-	-	-	-
France	-0.0641*** (-4.357)	-0.00038 (-0.0159)	-0.108*** (-4.942)	-0.0838*** (-5.336)
Italy	-0.146*** (-9.800)	-0.167*** (-5.897)	-0.186*** (-8.187)	-0.0836*** (-5.773)
Sweden	-0.0873*** (-5.556)	-0.137*** (-4.859)	-0.0826*** (-3.552)	-0.0418** (-2.587)
O. Chemical	-	-	-	-
Other service	-0.0399** (-2.169)	-0.0282 (-0.857)	-0.0793*** (-2.899)	-0.0124 (-0.628)
Machinery	-0.0584*** (-3.499)	-0.0438 (-1.324)	-0.0870*** (-3.555)	-0.0446** (-2.469)
Other_Pssector	-0.0627*** (-3.679)	-0.0422 (-1.234)	-0.117*** (-4.291)	-0.0290 (-1.463)
Other_Tertiary sectors	-0.0698*** (-4.058)	-0.0655** (-2.001)	-0.0920*** (-3.203)	-0.0520*** (-2.941)
Constant	0.171*** (5.754)	0.210*** (3.792)	0.290*** (6.429)	0.0121 (0.389)
Observations	363	363	363	363
R squared	0.503	0.402	0.336	0.300

Robust z-statistics in parentheses

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

This table shows the robustness check for the determinants of the disclosure level of actuarial assumptions (DAS), the textual disclosure (**Text_D**), the quantitative disclosure (**Quanti_D**) and the sensitivity disclosure (**Sensiti_D**). The robustness check includes 363 annual reports from 121 firms that employed the corridor method before the adoption of IAS 19R, uses the logarithm of total assets instead of the total assets, and uses the logarithm of number of employees instead of the number of employees. The **IAS 19R** equals 1 if the firm adopted the IAS 19R, otherwise, it equals 0; the **L_AF** stands for the

logarithm of analyst following; the **FO** stands for the foreign ownership; the **PFS** stands for the firm's pension funded status, it equals the pension assets divided by the defined benefit obligation (i.e. $PFS = PA/DBO$), which has been winsorized at 1% level; the **NE_** stands for the logarithm of number of employees in a firm; the **TA_** stands for the logarithm of total assets, the total assets has been winsorized at 1% level; **Machinery** examines whether the firm is in the field of Machinery; **Other_Psector** examines whether the firm is in the field of Other industries in the Primary and Secondary sectors; **Other_Tertiary** sectors examines whether the firm is in the field of Other industries in the Tertiary sectors; **Other service** examines whether the firm is in the field of other service; **Chemical** examines whether the firm is in the field of Chemistry.

To conclude, the results suggest that the application of IAS 19R (H1) and higher percentage of foreign ownership (H4) increase DAS, while the pension funded status (H5) is not found to have much effect on DAS. However, the relationship between number of analysts and DAS (H3) would be significantly influenced by the measurements of firm size: when firm size is measured as the logarithm of total assets, analyst following does not have significant effects on the DAS, but when the firm size is measured as the logarithm of number of employees, the analyst following has significant and positive effects on the DAS. As a result, Hypothesis 1 and Hypothesis 5 have been rejected, while Hypothesis 4 has been supported before and after the robustness check. Nevertheless, Hypothesis 3 has been rejected in the original ordered logistic squares regression, but accepted in the robustness check, which shows the significant effects of firm size on DAS (positive at the level of 0.01).

6.1.2 Comparability of DAS

Comparability, which is a determinant of useful information, allows users of financial reporting to assess an entity's performance associated with other entities at some point and over time (IASB: para. QC 20). Hypothesis 2 predicts that the comparability of DAS is lower after adopting IAS 19R. The comparability of DAS will be measured via three methods: the analysis of standard deviation of DAS, the analysis of difference between a firm's DAS, and the average of all firm's DAS and the analysis of the residuals of DAS.

Table 14 shows the analysis of dependent variables for Hypothesis 2; more specifically, the comparability of DAS, Text_D, Quanti_D and Sensiti_D. The results of Panel A show that the mean value of standard deviation of DAS and Sensiti_D under IAS 19 is significantly lower than that under IAS 19R.

Panel B shows that the mean value of Δ DAS and Δ Text_D is significantly higher after adopting the IAS 19R, which also suggests that the comparability of DAS and Sensiti_D are decreased under IAS 19R. Thus, results of Table 14 support Hypothesis 2 and suggest that the adoption of IAS 19R significantly decreases the comparability of DAS and Sensiti_D.

Table 14. Descriptive statistics

Panel A. Comparison of standard deviation of DAS, Text_D, Quanti_D and Sensiti_D

Variables	IAS 19		IAS 19R		Sd1/Sd2
	Obs	Sd1	Obs	Sd2	
DAS	200	0.112	200	0.133	0.846**
Text_D	200	0.214	200	0.208	1.029
Quanti_D	200	0.164	200	0.173	0.945
Sensiti_D	200	0.055	200	0.123	0.444***

Note: A two-sample t test is used to examine the difference between the dependent variables under IAS 19 and IAS 19R ***Significant level at 0.01 (2-tailed), **Significant level at 0.05 (2-tailed), *Significant level at 0.1 (2-tailed).

Panel B. Comparison of Δ DAS, Δ Text_D, Δ Quanti_D and Δ Sensiti_D

Variables	IAS 19		IAS 19R		Mean Diff
	Obs	Mean1	Obs	Mean2	
Δ DAS	200	0.092	200	0.11	-0.018**
Δ Text_D	200	0.179	200	0.173	0.006
Δ Quanti_D	200	0.13	200	0.138	-0.009
Δ Sensiti_D	200	0.06	200	0.1	-0.040***

Note: The observation includes 200 companies with 50 firms each from Sweden, Italy, Germany and France. Δ DAS stands for the comparability of DAS, which is measured as the absolute value of differences between a firm's DAS and the average of all firms' DAS; the Δ Text_D stands for the comparability of Text_D, which is measured as the absolute value of differences between a firm's Text_D and the average of all firms' Text_D; the Δ Quanti_D stands for the comparability of DAS, which is measured as the absolute value of differences between a firm's Quanti_D and the average of all firms' Quanti_D; the Δ Sensiti_D stands for the comparability of DAS, which is measured as the absolute value of differences between a firm's Sensiti_D and the average of all firms' Sensiti_D.

Table 15 presents the OLS results regarding the comparability of DAS, Text_D, Quanti_D and Sensiti_D. Moreover, the dependent variables are Δ DAS, Δ Text_D, Δ Quanti_D and Δ Sensiti_D.

Hypothesis 2 predicts a negative effect of adopting the IAS 19R on the comparability of the DAS. The dependent variables (i.e. Δ DAS, Δ Text_D, Δ Quanti_D and Δ Sensiti_D) in this table are defined as the absolute value of difference between a firm and the average value of all firms. For example, Δ DAS stands for the absolute value of difference between a firm's DAS and the average DAS, the bigger a firm's Δ DAS the less comparable a firm's DAS will be. Thus, the lower comparability indicates significantly more or much less disclosure than average. The coefficient of IAS 19R on Δ DAS is positive and significant at the level of 0.01. Thus, the results strongly support Hypothesis 2 and suggest that the adoption of IAS 19R decreases the comparability of DAS. The results also support the opinion of Glaum et al. (2018), who suggest that the accounting discretion reduces the comparability among firms.

Furthermore, the pension funded status has negative effects (at the level of 0.05) on the comparability of DAS, which means firms with higher pension funded status tend to have a higher level of comparability of DAS. In addition, the coefficient of both foreign ownership and firm size is positive and significant (at the level of 0.1 and 0.01 separately) which suggests that firms with more foreign ownership and of bigger size tend to have lower comparability of DAS. Moreover, compared with firms from Germany, firms from the other countries (i.e. France, Italy and Sweden) are more likely to have higher comparability of DAS. Table 15 also shows that firms in the field of Other industries in Primary and Secondary sectors tend to have comparability of DAS than firms in the field of Chemical.

Additionally, Table 15 shows that firms' comparability of Sensiti_D is decreased under the IAS 19R. In addition, firms with a bigger size tend to have lower comparability of Text_D, Quanti_D and Sensiti_D. Moreover, firms with more analyst following tend to have higher comparability of Quanti_D, while firms with more foreign ownership are more likely to have lower comparability of Text_D.

Table 15. Regression results examining the comparability of DAS, Text_D, Quanti_D and Sensiti_D

	m1	m2	m3	m4
VARIABLES	Δ DAS	Δ Text_D	Δ Quanti_D	Δ Sensiti_D
IAS 19R	0.0175**	-0.00607	0.00820	0.0387***

Table 15. Continued

VARIABLES	m1 Δ DAS	m2 Δ Text_D	m3 Δ Quanti_D	m4 Δ Sensiti_D
	(2.472)	(-0.522)	(0.788)	(6.896)
L_AF	-0.00876 (-1.642)	-0.00032 (-0.0367)	-0.0138* (-1.767)	0.00058 (0.138)
FO	0.0345* (1.651)	0.0607* (1.773)	0.0332 (1.083)	0.00266 (0.161)
PFS	-0.0248** (-2.111)	-0.0126 (-0.653)	-0.0171 (-0.994)	-0.00334 (-0.359)
TA_	0.0134*** (4.433)	0.0120** (2.417)	0.0184*** (4.145)	0.00761*** (3.182)
O. Germany	-	-	-	-
France	-0.0587*** (-5.493)	-0.0246 (-1.406)	-0.0564*** (-3.596)	-0.0658*** (-7.783)
Italy	-0.0365*** (-3.347)	-0.0311* (-1.740)	-0.00197 (-0.123)	-0.0612*** (-7.094)
Sweden	-0.0240** (-2.257)	-0.000498 (-0.0286)	-0.00130 (-0.0832)	-0.0352*** (-4.187)
O. Chemical	-	-	-	-
Other service	-0.0191 (-1.426)	-0.0713*** (-3.251)	-0.0177 (-0.900)	-0.0104 (-0.979)
Machinery	-0.00678 (-0.568)	0.0132 (0.673)	-0.0134 (-0.766)	-0.0258*** (-2.737)
Other_Pssector	-0.0283** (-2.098)	-0.0224 (-1.012)	-0.0277 (-1.396)	-0.0174 (-1.625)
Other_Tertiary sectors	-0.00361 (-0.285)	-0.0170 (-0.820)	-0.00791 (-0.425)	-0.0239** (-2.385)
Constant	0.0501** (2.477)	0.111*** (3.353)	0.0474 (1.593)	0.0628*** (3.921)
Observations	363	363	363	363
R squared	0.164	0.125	0.103	0.302

Robust z-statistics in parentheses

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

This table shows the regression results examining the comparability of the disclosure level of actuarial assumptions (**DAS**), the textual disclosure (**Text_D**), the quantitative

disclosure (**Quanti_D**) and the sensitivity disclosure (**Sensiti_D**). The $\Delta \text{DAS} / \Delta \text{Text_D} / \Delta \text{Quanti_D} / \Delta \text{Sensiti_D}$ means the difference between a firm's $\text{DAS} / \text{Text_D} / \text{Quanti_D} / \text{Sensiti_D}$ and the average of all firms' $\text{DAS} / \text{Text_D} / \text{Quanti_D} / \text{Sensiti_D}$ under IAS 19 and IAS 19R. Thus. The bigger a firm's $\Delta \text{DAS} / \Delta \text{Text_D} / \Delta \text{Quanti_D} / \Delta \text{Sensiti_D}$ is, the less comparable a firm's $\text{DAS} / \text{Text_D} / \text{Quanti_D} / \text{Sensiti_D}$ is; and the smaller a firm's $\Delta \text{DAS} / \Delta \text{Text_D} / \Delta \text{Quanti_D} / \Delta \text{Sensiti_D}$ is, the more comparable a firm's $\text{DAS} / \text{Text_D} / \text{Quanti_D} / \text{Sensiti_D}$ will be. The observation includes 363 annual reports from 200 listed European firms in the year the companies first adopted the IAS 19R and one year previously. The **IAS 19R** equals 1 if the firm adopted the IAS 19R, otherwise, it equals 0; the **L_AF** stands for the logarithm of analyst following; the **PFS** stands for the firm's pension funded status, which equals the pension assets divided by the defined benefit obligation (i.e. $\text{PFS} = \text{PA}/\text{DBO}$), which has been winsorized at 1% level; the **FO** stands for the foreign ownership; the **TA_** means the logarithm of total assets, which has been winsorized at 1% level; the **NE** stands for the logarithm of number of employees; the **Machinery** examines whether the firm is in the field of Machinery; **Other_Psector** examines whether the firm is in the field of Other industries in Primary and Secondary sectors; **Other_Tertiary sectors** examines whether the firm is in the field of Other industries in Tertiary sectors; **Other service** examines whether the firm is in the field of other service; **Chemical** examines whether the firm is in the field of Chemistry.

The third method used to examine the comparability of DAS, Text_D, Quanti_D and Sensiti_D is residuals. The study of residuals begins with the estimating ordinary least squares (OLS) regarding the determinants of DAS, Text_D, Quanti_D and Sensiti_D, which has been shown in Table 13 (i.e. the robustness check for determinants of DAS, Text_D, Quanti_D and Sensiti_D, in which the logarithm of number of employees instead of the logarithm of total assets is used to assess the firm size)³⁸. Second, the residuals are estimated based on the OLS regressions. Then, the OLS regression results concerning the association of IAS 19R and residuals are shown in Table 16. Moreover, the residuals are employed as dependent variables and measured as the residual squared of DAS, Text_D, Quanti_D and Sensiti_D.

It can be seen from Table 16 that the coefficient of IAS 19R is significant and positive for residuals of DAS and Sensiti_D. Thus, the results support that the adoption of IAS 19R decreases the comparability of DAS and Sensiti_D.

³⁸ This method is also considered to be a robustness check for the comparability of DAS; hence this method is based on the robustness check for determinants of DAS.

Table 16. The effect of IAS 19R on residual of comparability of DAS, Text_D Quanti_D and Sensiti_D

VARIABLES	m1 Resid_DAS	m2 Resid_Text_D	m3 Resid_Quanti_D	m4 Resid_Sensiti_D
IAS 19R	0.00213* (1.876)	0.00141 (0.362)	-0.00012 (-0.0384)	0.00720*** (5.793)
L_AF	-0.00005 (-0.0634)	0.00345 (1.633)	0.00160 (0.624)	0.00111* (1.859)
FO	0.00117 (0.407)	0.00039 (0.0354)	-0.00263 (-0.285)	-0.00050 (-0.141)
PFS	0.00019 (0.102)	0.00847 (1.299)	0.00246 (0.374)	0.00160 (0.901)
NE_	0.00031 (0.651)	-0.00328** (-2.311)	0.00182 (1.519)	0.00031 (0.560)
O. Germany	-	-	-	-
France	-0.00699*** (-3.630)	-0.0157*** (-3.096)	-0.00443 (-1.008)	-0.00885*** (-4.557)
Italy	-0.00492** (-2.483)	-0.00357 (-0.561)	0.00274 (0.466)	-0.00956*** (-6.192)
Sweden	-0.00263 (-1.195)	-0.00557 (-0.772)	0.00610 (1.347)	-0.00583*** (-2.718)
O. Chemical	-	-	-	-
Other service	-0.00053 (-0.229)	-0.0131 (-1.488)	-0.00004 (-0.00848)	-0.00265 (-1.056)
Machinery	-0.00084 (-0.380)	-0.00116 (-0.120)	-0.00423 (-1.097)	-0.00454* (-1.733)
Other_Psector	-0.00318 (-1.463)	-0.0103 (-1.108)	-0.00601 (-1.359)	-0.00429 (-1.526)
Other_Tertiary sectors	-0.00067 (-0.286)	-0.00836 (-0.930)	0.00570 (0.817)	-0.00682*** (-2.722)
Constant	0.00810** (2.368)	0.0566*** (4.136)	-0.00024 (-0.0300)	0.00854** (2.361)
Observations	363	363	363	363
R-squared	0.082	0.064	0.102	0.302

Robust t-statistics in parentheses

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

This table shows the regression results examining the comparability of the disclosure level of actuarial assumptions (**DAS**), the textual disclosure (**Text_D**), the quantitative disclosure (**Quanti_D**) and the sensitivity disclosure (**Sensiti_D**). The **Resid_DAS / Resid_Text_D / Resid_Quanti_D / Resid_Sensiti_D** means the residual squared of DAS / Text_D / Quanti_D / Sensiti_D in Table 13. The observation includes 363 annual reports from 200 listed European firms in the year the companies first adopted the IAS 19R and one year previously. The **IAS 19R** equals 1 if the firm adopted the IAS 19R, otherwise, it equals 0; the **L_AF** stands for the logarithm of analyst following; the **PFS** stands for the firm's pension funded status, which equals the pension assets divided by the defined benefit obligation (i.e. $PFS = PA/DBO$), which has been winsorized at 1% level; the **FO** stands for the foreign ownership; the **TA_** means the logarithm of total assets, which has been winsorized at 1% level; the **NE_** stands for the logarithm of number of employees; the Machinery examines whether the firm is in the field of Machinery; **Other_Psector** examines whether the firm is in the field of Other industries in Primary and Secondary sectors; **Other_Tertiary** sectors examines whether the firm is in the field of Other industries in Tertiary sectors; **Other service** examines whether the firm is in the field of Other service; **Chemical** examines whether the firm is in the field of Chemistry.

To conclude, this section uses three methods to analyze the effects of adopting the IAS 19R on the comparability of DAS, and all of them strongly suggest that the employment of IAS 19R decreases the comparability of DAS which support Hypothesis 2.

6.1.3 Additional tests

Aside from the regulations, the demand of investors also drives the disclosure quality. Thus, this section explores whether firms with greater demand from investors change their disclosure levels of actuarial assumptions more than firms with less demand from investors by involving interactions (i.e. $FO \cdot IAS\ 19R$, $L_AF \cdot IAS\ 19R$ and $FS \cdot IAS\ 19R$). Moreover, since different cultural background not only affects regulations but also investors, the effects of culture on DAS have also been examined in this section.

6.1.3.1 Culture effects

This section shows the results of cultural effects on DAS. The examination follows Hope et al. (2008) who use Secrecy to assess culture effects. Moreover, since Secrecy has been defined as the sum of scores of Uncertainty Avoidance (UA) and

Power Distance (PD) less scores of Individualism (IND), the three factors have been used in the robustness check to replace Secrecy in Table 18.

All three factors are Hofstede's culture factors: Uncertainty Avoidance is explained as *“the extent to which the members of institutions and organizations within a society feel threatened by uncertain, unknown, ambiguous, or unstructured situations”*; Power Distance is defined as *“the extent to which the less powerful members of institutions and organizations within a society expect and accept that power is distributed unequally”*; Individualism refers as *“a society in which the ties between individuals are loose: a person is expected to look after himself or herself and his or her immediate family only”*.

Table 17 shows the cultural factors that have been assessed by Hofstede's dimensions. In Panel A, culture effects among different countries are presented. It can be seen from the table that different countries have different scores of UA, PD and Secrecy. Thus, the scores of UA, PD and Secrecy can be used to stand for different countries. Moreover, France has the highest score of the three culture dimensions, followed by Italy, Germany and Sweden. Furthermore, in contrast to other culture dimensions, the highest score of IND is Italy, which is followed by France and Sweden, while Germany has the lowest score of IND.

Panel B shows the distribution of DAS, Text_D, Quanti_D and Sensiti_D among different countries. It can be seen that the mean value of DAS, Text_D, Quanti_D and Sensiti_D vary across different countries. Furthermore, the differences on DAS, Text_D, Quanti_D and Sensiti_D among different countries are significant. More specifically, the mean values of DAS and Text_D from high to low are: Germany, France, Sweden and Italy. However, the mean values of Quanti_D and Sensiti_D from high to low are: Germany, Sweden, France and Italy.

Thus, the results of Table 18 suggest that the scores of UA, PD and Secrecy for each country are different, which indicates the cultural diversity among countries. Moreover, the results also claim that country has significant effects on DAS, Text_D, Quanti_D and Sensiti_D. Hence, it is expected to have culture effects on DAS, Text_D, Quanti_D and Sensiti_D.

Table 17. Descriptive statistics

Panel A.	Scores of culture effects among different countries			
	UA	PD	IND	Secrecy
Germany	65	35	67	33
France	86	68	71	83
Italy	75	50	76	49
Sweden	29	31	71	-11

Note: The data are obtained from Hofstede et al. (2008) and <http://geert-hofstede.com/> (retrieved May 2013). **Secrecy** is used to assess the culture effects, which is equal to the sum of scores of **UA** and **PD** less scores of **IND**. **UA** means uncertainty Avoidance; **PD** stands for power distance; **IND** means individualism.

Panel B.	Distribution of DAS, Text_D, Quanti_D and Sensiti_D among countries			
	DAS	Text_D	Quanti_D	Sensiti_D
Mean value in Germany	0.365	0.54	0.447	0.108
Mean value in France	0.304	0.531	0.348	0.033
Mean value in Italy	0.198	0.332	0.242	0.02
Mean value in Sweden	0.270	0.384	0.36	0.064
Germany vs France	0.061***	0.009	0.099***	0.074***
Germany vs Italy	0.167***	0.208***	0.204***	0.088***
Germany vs Sweden	0.095***	0.156***	0.087***	0.043**
France vs Italy	0.106***	0.199***	0.106***	0.013
France vs Sweden	0.034**	0.147***	-0.012	-0.031**
Italy vs Sweden	-0.071***	-0.052*	-0.118***	-0.044***

Note: The observation includes 200 companies with 50 firms each from Sweden, Italy, Germany and France. The **DAS** means the disclosure level of actuarial assumptions; the **Sensiti_D** means the sensitivity disclosure of actuarial assumptions; the **Text_D** means the textual disclosure of actuarial assumptions; the **Quanti_D** means the quantitative disclosure of actuarial assumptions.

Tables 18 and 19 present the culture effects on DAS, Text_D, Quanti_D and Sensiti_D. It can be seen from Table 18 that Secrecy has significant and positive effects on Text_D, but significantly negative effects on Sensiti_D. Thus, firms from countries with a higher secrecy level are more likely to have higher Text_D and lower Sensiti_D. Moreover, Table 12 also presents the effects of different countries on Text_D and Sensiti_D: compared with German firms, Italian firms and Swedish firms are more likely to have lower Text_D and Sensiti_D. Since the scores of Secrecy from high to low are: France, Italy, Germany and Sweden, the results of Table 19 are not totally in line with the results of Table 12 concerning the

country effects on Text_D and Sensiti_D, which may be caused by the ordered culture scores (i.e. the scores of secrecy).

Furthermore, Table 19 shows that the coefficient of individualism is negative and significant for DAS, Text_D, Quanti_D and Sensiti_D, which claims that firms from countries with a higher level of individualism tend to have lower DAS, Text_D, Quanti_D and Sensiti_D. Since the scores of individualism from high to low are: Italy, France, Sweden and Germany (France and Sweden have the same score), results of Table 19 support the results of Table 12 which suggest that, compared with German firms, firms from other countries tend to have lower DAS, Text_D, Quanti_D and Sensiti_D.

To conclude, the results of Tables 18 and 19 support the expectation in Table 17 and reveal that culture has an effect on DAS, Text_D, Quanti_D and Sensiti_D. Moreover, different measures of assessing the cultural effects have different results: the level of Secrecy has positive effects on Text_D but negative effects on Sensiti_D; while the level of individualism has negative effects on DAS, Text_D, Quanti_D and Sensiti_D.

Table 18. The examination of culture effects on DAS, Text_D Quanti_D and Sensiti_D

VARIABLES	m1	m2	m3	m4
	DAS	Text_D	Quanti_D	Sensiti_D
IAS 19R	0.603*** (3.156)	0.282 (1.533)	0.161 (0.837)	1.754*** (6.521)
Secrecy	0.00367 (1.215)	0.0141*** (4.472)	-0.00339 (-1.048)	-0.0113*** (-2.804)
L_AF	0.477*** (3.348)	0.462*** (3.705)	0.356** (2.472)	0.211 (1.087)
FO	1.604*** (3.282)	1.553*** (3.322)	1.665*** (2.945)	0.437 (0.640)
PFS	0.864** (2.256)	0.692** (1.963)	0.858** (2.306)	0.507 (1.157)
TA_	0.142 (1.610)	0.190** (2.267)	-0.00105 (-0.0129)	0.190 (1.577)
O. Chemical	-	-	-	-
Other service	-0.268	0.0820	-0.757**	0.0734

(-0.757) (0.265) (-2.043) (0.160)

Table 18. Continued

	m1	m2	m3	m4
VARIABLES	DAS	Text_D	Quanti_D	Sensiti_D
Machinery	-0.599* (-1.796)	-0.0431 (-0.133)	-0.764** (-2.249)	-0.684 (-1.608)
Other_Pssector	-1.114*** (-3.178)	-0.323 (-0.914)	-1.441*** (-3.950)	-0.878* (-1.867)
Other_Tertiary sectors	-0.988*** (-2.677)	-0.392 (-1.209)	-1.030*** (-2.737)	-1.334*** (-2.735)
Observations	363	363	363	363
Pseudo R2	0.0582	0.0833	0.0551	0.1277

Robust z-statistics in parentheses

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

This table shows the regression results examining the culture effects on the disclosure level of actuarial assumptions (**DAS**), the textual disclosure (**Text_D**), the quantitative disclosure (**Quanti_D**) and the sensitivity disclosure (**Sensiti_D**). The observation includes 400 annual reports from 200 listed European firms in the year the companies first adopted the IAS 19R and one year previously. The **IAS 19R** equals 1 if the firm adopted the IAS 19R, otherwise, it equals 0. **Secrecy** stands for culture effects, which equals the scores of Uncertainty Avoidance (**UA**) plus scores of Power Distance (**PD**) less scores of individuals (**IND**); **L_AF** stands for the logarithm of analyst following; **PFS** stands for the firm's pension funded status, which equals the pension assets divided by the defined benefit obligation (i.e. PFS = PA/DBO), which has been winsorized at 1% level; the **FO** stands for the foreign ownership; the **TA_** means the logarithm of total assets, which has been winsorized at 1% level; the **NE_** stands for the logarithm of number of employees; the **Machinery** examines whether the firm is in the field of Machinery; **Other_Pssector** examines whether the firm is in the field of Other industries in Primary and Secondary sectors; **Other_Tertiary sectors** examines whether the firm is in the field of Other industries in Tertiary sectors; **Other service** examines whether the firm is in the field of other service; **Chemical** examines whether the firm is in the field of Chemistry.

Table 19. The robustness check for culture effects on DAS, Text_D, Quanti_D and Sensiti_D

VARIABLES	m1 DAS	m2 Text_D	m3 Quanti_D	m4 Sensiti_D
IAS 19R	0.748*** (3.843)	0.342* (1.803)	0.216 (1.117)	1.978*** (6.540)
UA	0.0133 (1.431)	0.0151 (1.556)	0.00022 (0.0222)	0.00365 (0.289)
PD	-0.00130 (-0.105)	0.0196 (1.624)	-0.00401 (-0.310)	-0.0313 (-1.579)
IND	-0.365*** (-9.725)	-0.274*** (-7.259)	-0.289*** (-7.324)	-0.232*** (-4.043)
L_AF	0.165 (1.111)	0.234* (1.869)	0.0410 (0.239)	-0.0283 (-0.144)
FO	1.449*** (2.766)	1.344*** (2.792)	1.328** (2.521)	-0.131 (-0.175)
PFS	0.593* (1.772)	0.314 (0.887)	0.553 (1.459)	0.490 (1.132)
TA_	0.393*** (4.617)	0.362*** (4.504)	0.214** (2.302)	0.345*** (3.069)
O. Chemical	-	-	-	-
Other service	-0.610* (-1.688)	-0.200 (-0.592)	-1.195*** (-3.186)	-0.181 (-0.381)
Machinery	-0.816** (-2.487)	-0.214 (-0.633)	-1.075*** (-3.241)	-0.984** (-2.223)
Other_Psector	-0.941*** (-2.791)	-0.228 (-0.636)	-1.504*** (-4.030)	-0.664 (-1.308)
Other_Tertiary sectors	-0.973*** (-2.920)	-0.444 (-1.325)	-1.198*** (-3.251)	-1.559*** (-3.368)
Observations	363	363	363	363
Pseudo R2	0.1089	0.1269	0.1104	0.1777

Robust z-statistics in parentheses

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

This table shows the robustness check for the culture effects on the disclosure level of actuarial assumptions (**DAS**), the textual disclosure (**Text_D**), the quantitative disclosure (**Quanti_D**) and the sensitivity disclosure (**Sensiti_D**). The robustness check includes 400 annual reports from 200 listed European firms in the year the companies first adopted

the IAS 19R and one year previously. Moreover, it uses Uncertainty Avoidance, Power Distance and Individuals to assess the culture effects instead of Secrecy. The **IAS 19R** equals 1 if the firm adopted the IAS 19R, otherwise, it equals 0. The **UA** stands for scores of Uncertainty Avoidance; the **PD** stands for scores of Power Distance, the **IND** stands for scores of individuals; the **L_AF** stands for the logarithm of analyst following; the **PFS** stands for the firm's pension funded status, which equals the pension assets divided by the defined benefit obligation (i.e. $PFS = PA/DBO$), which has been winsorized at 1% level; the **FO** stands for the foreign ownership; the **TA_** means the logarithm of total assets, which has been winsorized at 1% level; the **NE_** stands for the logarithm of number of employees; **Machinery** examines whether the firm is in the field of Machinery; **Other_Psector** examines whether the firm is in the field of Other industries in Primary and Secondary sectors; **Other_Tertiary sectors** examines whether the firm is in the field of Other industries in Tertiary sectors; **Other service** examines whether the firm is in the field of other service; **Chemical** examines whether the firm is in the field of Chemistry.

6.1.3.2 Company factors and change in disclosures

This section shows the effects of corporate factors (i.e. analyst following, foreign ownership and pension funded status) on DAS by including interactions.

Tables 20, 21 and 22 examine whether the application of IAS 19R changes the effects of analyst following, foreign ownership and pension funded status on DAS by employing $L_AF*IAS\ 19R$, $FO*IAS\ 19R$ and $PFS*IAS\ 19R$ separately.

The results of Table 20 reveal that the effects of analyst following on DAS, *Text_D*, *Quanti_D* and *Sensiti_D* do not change after the employment of IAS 19R. Moreover, Table 21 shows that the estimated coefficient on $FO*IAS\ 19R$ is significant and positive for *Quanti_D*; therefore, firms with higher percentage of foreign ownership tend to have higher *Quanti_D* after the adoption of IAS 19R. Furthermore, Table 22 claims no significant effects of $PFS*IAS\ 19R$ on DAS, *Text_D*, *Quanti_D* and *Sensiti_D*. Hence, the implementation of IAS 19R does not differ in regard to the effects of pension funded status on DAS.

Table 20. Regression results examining the effects of analyst following on DAS, Text_D, Quanti_D and Sensiti_D after adopting the IAS 19R

VARIABLES	m1 DAS	m2 Text_D	m3 Quanti_D	m4 Sensiti_D
IAS 19R	0.714** (1.977)	0.743** (2.318)	0.180 (0.479)	1.724*** (2.678)
L_AF	0.156 (0.959)	0.346** (2.356)	0.0309 (0.154)	-0.110 (-0.440)
FO	1.449*** (2.768)	1.337*** (2.796)	1.329** (2.522)	-0.121 (-0.162)
PFS	0.592* (1.772)	0.332 (0.943)	0.551 (1.455)	0.480 (1.106)
TA_	0.394*** (4.628)	0.358*** (4.468)	0.214** (2.303)	0.344*** (3.074)
L_AFIAS 19R	0.0187 (0.112)	-0.224 (-1.386)	0.0197 (0.106)	0.123 (0.449)
O. Germany	-	-	-	-
France	-1.225*** (-4.138)	-0.130 (-0.480)	-1.284*** (-4.622)	-1.879*** (-4.491)
Italy	-3.171*** (-9.275)	-2.025*** (-6.023)	-2.660*** (-7.879)	-2.521*** (-5.309)
Sweden	-1.933*** (-5.550)	-1.727*** (-5.164)	-1.148*** (-3.532)	-0.929** (-2.438)
O. Chemical	-	-	-	-
Other service	-0.609* (-1.674)	-0.217 (-0.638)	-1.194*** (-3.182)	-0.183 (-0.384)
Machinery	-0.815** (-2.475)	-0.226 (-0.666)	-1.074*** (-3.240)	-0.988** (-2.227)
Other_Pssector	-0.941*** (-2.794)	-0.232 (-0.646)	-1.504*** (-4.031)	-0.671 (-1.314)
Other_Tertiary sectors	-0.972*** (-2.917)	-0.452 (-1.347)	-1.197*** (-3.246)	-1.560*** (-3.359)
Observations	363	363	363	363
Pseudo R2	0.1089	0.128	0.1104	0.1781

Robust z-statistics in parentheses

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

This table shows the regression results examining the effects of analyst following on the disclosure level of actuarial assumptions (**DAS**), the textual disclosure (**Text_D**), the quantitative disclosure (**Quanti_D**) and the sensitivity disclosure (**Sensiti_D**) after adopting the IAS 19R. The observation includes 363 annual reports from 200 listed European firms in the year the companies first adopted the IAS 19R and one year previously. The **IAS 19R** equals 1 if the firm adopted the IAS 19R, otherwise, it equals 0; the **L_AF** stands for the logarithm of analyst following; the **PFS** stands for the firm's pension funded status, which equals the pension assets divided by the defined benefit obligation (i.e. $PFS = PA/DBO$), which has been winsorized at 1% level; the **FO** stands for the foreign ownership; the **TA** means the total assets of a firm, which has been winsorized at 1% level; the **NE** stands for the number of employees in a firm; the **L_AFIAS 19R** is an interaction between the **L_AF** and the IAS 19R; the **Machinery** examines whether the firm is in the field of Machinery; **Other_Psector** examines whether the firm is in the field of Other industries in Primary and Secondary sectors; **Other_Tertiary sectors** examines whether the firm is in the field of Other industries in Tertiary sectors; **Other service** examines whether the firm is in the field of other service; **Chemical** examines whether the firm is in the field of Chemistry.

Table 21. Regression results examining the effects of foreign ownership on DAS, Text_D, Quanti_D and Sensiti_D after adopting the IAS 19R

VARIABLES	m1	m2	m3	m4
	DAS	Text_D	Quanti_D	Sensiti_D
IAS 19R	0.477* (1.866)	0.261 (1.087)	-0.0988 (-0.379)	1.744*** (4.363)
L_AF	0.174 (1.196)	0.238* (1.889)	0.0578 (0.339)	-0.0201 (-0.104)
FO	0.777 (1.365)	1.137** (2.061)	0.470 (0.670)	-0.926 (-0.871)
PFS	0.578* (1.735)	0.315 (0.889)	0.527 (1.385)	0.508 (1.159)
TA_	0.387*** (4.539)	0.358*** (4.403)	0.208** (2.237)	0.339*** (3.020)
FOIAS 19R	1.549 (1.613)	0.464 (0.503)	1.750* (1.893)	1.213 (0.924)
O. Germany	-	-	-	-

Table 21. Continued

VARIABLES	m1 DAS	m2 Text_D	m3 Quanti_D	m4 Sensiti_D
France	-1.232*** (-4.175)	-0.124 (-0.457)	-1.304*** (-4.675)	-1.898*** (-4.545)
Italy	-3.164*** (-9.239)	-2.011*** (-5.953)	-2.664*** (-7.904)	-2.520*** (-5.339)
Sweden	-1.926*** (-5.502)	-1.712*** (-5.131)	-1.141*** (-3.482)	-0.942** (-2.474)
O. Chemical	-	-	-	-
Other service	-0.610* (-1.721)	-0.201 (-0.597)	-1.203*** (-3.239)	-0.179 (-0.376)
Machinery	-0.821** (-2.513)	-0.214 (-0.634)	-1.094*** (-3.312)	-0.990** (-2.220)
Other_Psector	-0.951*** (-2.871)	-0.228 (-0.637)	-1.526*** (-4.041)	-0.663 (-1.319)
Other_Tertiary sectors	-0.984*** (-2.984)	-0.445 (-1.330)	-1.222*** (-3.326)	-1.569*** (-3.343)
Observations	363	363	363	363
Pseudo R2	0.11	0.127	0.1127	0.1789

Robust z-statistics in parentheses

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

This table shows the regression results examining the effects of foreign ownership on the disclosure level of actuarial assumptions (**DAS**), the textual disclosure (**Text_D**), the quantitative disclosure (**Quanti_D**) and the sensitivity disclosure (**Sensiti_D**) after adopting the IAS 19R. The observation includes 363 annual reports from 200 listed European firms in the year the companies first adopted the IAS 19R and one year previously. The **IAS 19R** equals 1 if the firm adopted the IAS 19R, otherwise, it equals 0; the **L_AF** stands for the logarithm of analyst following; the **PFS** stands for the firm's pension funded status, which equals the pension assets divided by the defined benefit obligation (i.e. $PFS = PA/DBO$), which has been winsorized at 1% level; the **FO** stands for the foreign ownership; the **TA** means the total assets of a firm, which has been winsorized at 1% level; the **NE** stands for the number of employees in a firm; the **FOIAS 19R** is an interaction between the FO and the IAS 19R; the **Machinery** examines whether the firm is in the field of Machinery; **Other_Psector** examines whether the firm is in the field of Other industries in Primary and Secondary sectors; **Other_Tertiary sectors** examines

whether the firm is in the field of Other industries in Tertiary sectors; **Other service** examines whether the firm is in the field of other service; **Chemical** examines whether the firm is in the field of Chemistry.

Table 22. Regression results examining the effects of pension funded status on DAS, DAS, Text_D, Quanti_D and Sensiti_D after adopting the IAS 19R

VARIABLES	m1 DAS	m2 Text_D	m3 Quanti_D	m4 Sensiti_D
IAS 19R	0.674** (2.575)	0.303 (1.213)	0.343 (1.413)	1.694*** (3.755)
L_AF	0.166 (1.112)	0.234* (1.865)	0.0398 (0.231)	-0.0387 (-0.195)
FO	1.442*** (2.764)	1.346*** (2.796)	1.341** (2.511)	-0.0932 (-0.124)
PFS	0.483 (1.127)	0.253 (0.548)	0.754 (1.531)	0.0363 (0.0546)
TA_	0.393*** (4.613)	0.361*** (4.504)	0.215** (2.310)	0.348*** (3.044)
PFSIAS 19R	0.219 (0.416)	0.120 (0.217)	-0.394 (-0.675)	0.666 (0.867)
Germany	-	-	-	-
France	-1.222*** (-4.125)	-0.127 (-0.468)	-1.286*** (-4.630)	-1.878*** (-4.533)
Italy	-3.170*** (-9.269)	-2.016*** (-5.976)	-2.661*** (-7.893)	-2.514*** (-5.339)
Sweden	-1.930*** (-5.538)	-1.717*** (-5.139)	-1.151*** (-3.558)	-0.936** (-2.481)
Other service	-0.612* (-1.694)	-0.201 (-0.594)	-1.192*** (-3.174)	-0.189 (-0.396)
O. Chemical	-	-	-	-
Machinery	-0.813** (-2.479)	-0.212 (-0.627)	-1.078*** (-3.248)	-0.984** (-2.217)
Other_Psector	-0.941*** (-2.793)	-0.228 (-0.634)	-1.504*** (-4.035)	-0.668 (-1.316)
Other_Tertiary sectors	-0.974***	-0.443	-1.196***	-1.568***

(-2.925) (-1.324) (-3.249) (-3.385)

Table 22. Continued

VARIABLES	m1 DAS	m2 Text_D	m3 Quanti_D	m4 Sensiti_D
Observations	363	363	363	363
Pseudo R2	0.1089	0.1269	0.1108	0.1789

Robust z-statistics in parentheses

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

This table shows the regression results examining the effects of pension funded status on the disclosure level of actuarial assumptions (**DAS**), the textual disclosure (**Text_D**), the quantitative disclosure (**Quanti_D**) and the sensitivity disclosure (**Sensiti_D**) after adopting the IAS 19R. The observation includes 363 annual reports from 200 listed European firms in the year the companies first adopted the IAS 19R and one year previously. The **IAS 19R** equals 1 if the firm adopted the IAS 19R, otherwise, it equals 0; the **L_AF** stands for the logarithm of analyst following; the **PFS** stands for the firm's pension funded status, which equals the pension assets divided by the defined benefit obligation (i.e. $PFS = PA/DBO$), which has been winsorized at 1% level; the **FO** stands for the foreign ownership; the **TA** means the total assets of a firm, which has been winsorized at 1% level; the **NE** stands for the number of employees in a firm; the **PFSIAS 19R** is an interaction between the PFS and the IAS 19R; the **Machinery** examines whether the firm is in the field of Machinery; **Other_Psector** examines whether the firm is in the field of Other industries in Primary and Secondary sectors; **Other_Tertiary sectors** examines whether the firm is in the field of Other industries in Tertiary sectors; **Other service** examines whether the firm is in the field of other service; **Chemical** examines whether the firm is in the field of Chemistry.

6.1.4 Summary of results

To conclude, section 6.1 shows the results for the DAS. More specifically, it focuses upon the effects of the IAS 19R on DAS, the comparability of DAS and other determinants of DAS (i.e. analysts, foreign ownership, pension funded status, and culture).

The results of this section reveal that the adoption of the IAS 19R significantly improves the DAS, while reducing the comparability of DAS. Moreover, foreign ownership and firm size have positive effects on the DAS. In addition, the different measurements of firm size impact upon the effects of analyst following on DAS:

when the logarithm of total assets is employed as firm size, the analyst following does not have significant effects on DAS, but when the firm size is measured as the logarithm of number of employees, the analyst following has significantly positive effects on DAS. Additionally, firms with more foreign ownership tend to have higher *Quanti_D* after adopting the IAS 19R. It is also found that firms from countries with a higher level of individualism are more likely to have lower DAS, *Text_D*, *Quanti_D* and *Sensiti_D*. However, firms from countries with a higher level of secrecy tend to have higher *Text_D* but lower *Sensiti_D*.

In contrast to previous articles, this dissertation examines the DAS and analyses the DAS with hand-collected data from 200 firms' 2-year annual reports. Moreover, the DAS has been defined according to the IFRS (IASB, IAS 19 2013), and, in order to make a detailed analysis the DAS has been further divided as *Text_D*, *Quanti_D* and *Sensiti_D*. Thus, readers can have a clear view of the DAS, not only through the theory and principles in the IAS 19R (IASB 2013), but also from the application of the IAS 19R among the 200 samples. Furthermore, three methods have been used to analyze the comparability of DAS. In addition, this dissertation also takes the cultural effects into consideration.

6.2 Determinants of corridor method users and compliance disclosure

This part presents the empirical results for the corridor method. More specifically, this section shows the results regarding the relationship between leverage and corridor method users (Hypothesis 6), the association between ownership concentration and corridor method users (Hypothesis 7) and the effects of ownership structure on compliance disclosure about corridor method (Hypothesis 8).

6.2.1 Determinants of using the corridor method

Before the IAS 19R, there were three methods for recognizing actuarial gains and losses (IAS 19R: para. BC 66): 1) the equity method (i.e. to recognize actuarial gains and losses in other comprehensive income and transferred to retained earnings); 2) immediately recognize actuarial gains and losses in profit or losses (which is also the rule to recognize the actuarial gains and losses under IAS 19R); and 3) the corridor method. The corridor method allows the “within corridor”³⁹ actuarial gains and losses not to be recognized in other comprehensive income or profit or

³⁹ The corridor is the greater of 10% of the defined benefit obligation and 10% of the fair value of any plan assets.

losses. Hence, firms with certain characteristics have an incentive to use the corridor method. Moreover, based on chapter 4, the expected determinants of using the corridor method are leverage and ownership concentration. This section will employ 200 observations before the adopting of IAS 19R and the model 3 (in section 5.4.1) to examine the determinants of using the corridor method.

6.2.1.1 Univariate results

Table 23 shows the distribution of corridor method users among different countries. It can be seen from the table that except for Swedish firms, firms in the sample (i.e. German firms, French firms and Italian firms) prefer to be non-corridor method users. Thus, country affects the choice of using the corridor method.

Table 23. The distribution of corridor method users among different countries

	Non-CM users		CM users		Total	
Germany	27	54%	23	46%	50	100%
France	39	78%	11	22%	50	100%
Italy	27	54%	23	46%	50	100%
Sweden	16	32%	34	68%	50	100%
Total	109	54.5%	91	45.5%	200	100%
Pearson chi2(3) = 42.7059 Pr = 0.00						

Note: Chi-square is used to test whether there is an association between different countries and corridor method users. ***Significant at the 0.01 level (2-tailed), **Significant at the 0.05 level (2-tailed), *Significant at 0.1 level (2-tailed).

Table 24 shows that except for firms in the field of Machinery and Other Primary and Secondary industries, firms from other fields are less likely to use the corridor method. Moreover, the non-corridor method users account for 72.73% in the field of other service. Thus, industry affects firms' choices to be corridor method users.

Table 24. The distribution of corridor method users among different industries

	Non-CM users		CM users		Total	
Chemical	15	60%	10	40%	25	100%
Machinery	30	46.15%	35	53.85%	65	100%
Other Tertiary industry	23	54.76%	19	45.24%	42	100%
Other service	24	72.73%	9	27.27%	33	100%
Other primary & secondary industries	17	48.57%	18	51.43%	35	100%
Total	109	54.5%	91	45.5%	200	100%

Pearson $\chi^2(4) = 14.0988$ Pr = 0.007

Note: Chi-square is used to examine whether there is a relationship between industry and corridor method users. ***Significant at the 0.01 level (2-tailed), **Significant at the 0.05 level (2-tailed), *Significant at 0.1 level (2-tailed).

Even though few articles investigate the effects of culture on the use of the corridor method, the country effects of employing the corridor method have been identified (e.g. Fasshauer et al. 2008). Thus, it is expected that there will be an association between culture and the use of the corridor method.

Table 25 presents the relationship between culture and the use of the corridor method. More specifically, Table 25 shows that the mean values of UA, PD and secrecy for non-corridor method users are significantly different from those of corridor method users.

Table 25. The descriptive statistics of cultural effects on the use of the corridor method

Variables	Non-CM	Mean	CM	Mean	Mean Diff
UA	109	69.706	91	56.615	13.091***
PD	109	49.936	91	41.286	8.650***
IND	109	71.248	91	71.253	-0.005
Secrecy	109	48.394	91	26.648	21.746***

Note: The observation includes 200 companies with 50 firms each from Sweden, Italy, Germany and France. CM means the corridor method users; Non-CM stands for the non-corridor method users; UA examines the uncertainty avoidance of culture; PD examines the power distance of culture; IND investigates the individual level of culture; and Secrecy examines the secrecy level of culture.

Table 26 shows the descriptive statistics for test variables of Hypotheses 6 and 7: leverage (i.e. in Panel A) and ownership concentration (i.e. in Panel B).

In order to analyze the effects of leverage/ownership concentration on corridor method users, the observations have been divided into firms with lower leverage/ownership concentration (i.e. firms' leverage/ownership concentration that is lower than the median of all firms' leverage/ownership concentration) and firms with higher leverage/ownership concentration (i.e. firms' leverage/ownership concentration that is equal to or higher than the median of all firms' leverage/ownership concentration).

Moreover, the mean value of firms with lower leverage/ownership concentration has been compared with the mean value of firms that have higher leverage/ownership concentration, and the results show that there is no significant difference between the mean value of firms with lower leverage/ownership concentration and the mean value of firms with higher leverage/ownership concentration.

Thus, the results in Table 26 reject Hypothesis 6 as well as Hypothesis 7 and reveal that neither the leverage nor the ownership concentration affects the use of corridor method.

Table 26. Descriptive statistics

Panel A. Comparison for leverage					
Variables	Firms with lower LEV	Mean	Firms with higher LEV	Mean	Mean Diff
CM	100	0.463	100	0.448	0.016

Panel B. Comparison for ownership concentration					
Variables	Firms with higher OC	Mean	Firms with lower OC	Mean	Mean Diff
CM	100	0.47	100	0.44	0.03

Note: The observation includes 200 companies with 50 firms each from Sweden, Italy, Germany and France. The LEV means the leverage, which is measured as the total debts divided by total assets and has been winsorized at 1%; the OC means the ownership concentration; the CM means the corridor method user, it equals 1 if a firm is a corridor method user, otherwise, it equals 0; the firms with lower LEV / OC are the firms have the under median value LEV / OC, otherwise they are considered to be firms with higher LEV / OC.

6.2.1.2 Regression results

Table 27 shows the logit regression results regarding the determinants of employing the corridor method.

Hypothesis 6 predicts a positive relationship between leverage and the use of the corridor method. However, the results show that the coefficient of LEV is not significant. Thus, the leverage does not have significant effects on the use of the corridor method. Hence, the results do not support Hypothesis 6. This result is in contrast to the findings of Morais (2010), who finds firms with higher leverage tend to use the corridor method to mitigate the effects of debts. This could be due to the different research periods with different samples.

Hypothesis 7 suggests a negative effect of ownership concentration on the use of the corridor method. Nevertheless, the coefficient of both ownership concentration (OC) and large ownership (Large) is not significant, thus rejecting Hypothesis 7. It is believed that firms with less ownership concentration tend to use an income-increasing accounting method (Astami and Tower: 2006), and the use of the corridor method may lead to unrecognized actuarial gains and losses which affect profitability. However, the magnitude of the effects of unrecognized actuarial gains and losses on profitability decides the use of the corridor method. Thus, a possible reason for the lack of relationship between ownership concentration and the use of the corridor method could be that the sample included in this dissertation is 200 firms with different firm size, which leads to different amount of unrecognized actuarial gains and losses.

Furthermore, it can be seen from Table 27 that the coefficient of AGL_R is significant and positive, which suggests that firms with more actuarial gains and losses (i.e. the difference between actuarial gains and actuarial losses) are more likely to use the corridor method. In addition, compared with German firms, French firms are less likely to use the corridor method.

Table 27. Determinants of using the corridor method

VARIABLES	m1 CM
LEV	-1.723 (-1.122)
OC	-0.00818 (-0.613)
Large	0.401 (0.611)
AGL_R	31.54** (2.452)
ROE	0.00408 (0.542)
PM	0.0185 (1.075)
TA_	0.0452 (0.482)
O. Germany	-
France	-1.100** (-2.150)
Italy	0.00767 (0.0159)
Sweden	0.832 (1.595)
O. Chemical	-
Other service	-0.649 (-0.983)
Machinery	0.503 (0.858)
Other_Psector	0.549 (0.844)
Other_Tertiary sectors	0.340 (0.555)
Constant	-0.337 (-0.359)
Observations	187
Pseudo R2	0.1487

Robust z-statistics in parentheses

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

This table shows the regression results examining the determinants of using the corridor method. The 187 observations are obtained from the annual reports in the year before the 200 firms first adopted the IAS 19R. The **CM** examines whether a firm is a corridor method user, it equals 1 if the firm is a corridor method user, otherwise it is not; the **LEV** means the leverage which is calculated as the total debts divided by total assets and has been winsorized at 1%; the **OC** means the ownership concentration; **Large** means the large ownership, it equals 1 if an entity's ownership concentration is more than average of all entities' ownership concentration, it equals 0 if otherwise; **AGL_R** means the difference between actuarial gains and actuarial losses divided by the total assets, and its currency is million Euros; **ROE** means the return of shareholders' earnings which has been winsorized at 1%; **PM** means the profit margin which has been winsorized at 1%; **TA_** means the logarithm of total assets, and its currency is million Euros, which has been winsorized at 1%; **Other service** examines whether the firm is in the field of other service; **Machinery** examines whether the firm is in the field of Machinery; **Other_Psector** examines whether the firm is in the field of Other industries in Primary and Secondary sectors; **Other_Tertiary sectors** examines whether the firm is in the field of Other industries in Tertiary sectors.

Table 28 presents the robustness check for determinants of using the corridor method, which uses operating revenue to replace profit margin, employing ROEN instead of ROE. Moreover, the logarithm of total assets has been replaced by the logarithm of number of employees.

It can be seen from Table 28 that neither the ownership concentration nor the leverage has an effect on the use of the corridor method. Thus, Hypothesis 6 and Hypothesis 7 are rejected. Moreover, the robustness check suggests significant and positive effects of **AGL_R** on the use of the corridor method. Furthermore, French firms are still less likely to use the corridor method. However, the Swedish firms begin to show positive effects on the use of the corridor method compared to German firms. In addition, firm size and operating revenue begin to show positive effects on the use of the corridor method in the robustness check.

Table 28. Robustness check for determinants of using the corridor method

VARIABLES	m1 CM
LEV	-0.132 (-0.0832)
OC	-0.00436 (-0.350)
Large	0.372 (0.559)
AGL_R	27.19** (2.381)
ROEN	-0.00116 (-0.735)
OR_A	1.108*** (2.885)
NE_	0.177* (1.686)
O. Germany	-
France	-1.059* (-1.954)
Italy	0.300 (0.615)
Sweden	1.129** (2.128)
O. chemical	-
Other service	-1.040 (-1.603)
Machinery	0.155 (0.275)
Other_Psector	0.0812 (0.131)
Other_Tertiary sectors	-0.227 (-0.392)
Constant	-2.504** (-2.000)
Observations	190
Pseudo R2	0.1847

Robust z-statistics in parentheses

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

This table shows the regression results of the robust check examining the determinants of using the corridor method. The ROE has been replaced by ROEN, the PM has been replaced by the OR_A, the TA_ has been replaced by NE_. The **CM** examines whether a firm is a corridor method user, it equals 1 if the firm is a corridor method user, otherwise it is not; the **LEV** means the leverage which is calculated as the total debts divided by total assets and has been winsorized at 1%; the **OC** means the ownership concentration; **Large** means the large ownership, it equals 1 if an entity's ownership concentration is more than average of all entities' ownership concentration, it equals 0 if otherwise; the **AGL_R** means the difference between actuarial gains and actuarial losses divided by the total assets, and its currency is million Euros; the **ROEN** means the ROE using net income and it has been winsorized at 1%; the **OR_A** means the operating revenue which has been divided by the total assets, and its currency is million Euros and it has been winsorized at 1%; the **NE_** means the logarithm of number of employees; **Chemical** examines whether the firm is in the field of Chemistry; **Other service** examines whether the firm is in the field of other service; the **Machinery** examines whether the firm is in the field of Machinery; **Other_Pssector** examines whether the firm is in the field of Other industries in Primary and Secondary sectors; **Other_Tertiary sectors** examines whether the firm is in the field of Other industries in Tertiary sectors.

6.2.2 Determinants of compliance disclosure about the corridor method

This section shows the results for Hypothesis 8, which focuses on the effects of ownership concentration on compliance disclosure regarding the corridor method. As stated earlier, the corridor method is removed under the IAS 19R; thus the corridor method users are expected to be affected by the adopting of the IAS 19R. The compliance disclosure regarding the corridor method is the restatement according to the IAS 19R of items under the IAS 19 that related to the corridor method. Thus, the examination of compliance disclosure regarding the corridor method can clarify the differences between the application of IAS 19 and IAS 19R. Moreover, as the corridor method users are expected to have compliance disclosure about the corridor method, this section will focus on the corridor method users.

6.2.2.1 Univariate results

The results of Table 29 show that there is a significantly positive relationship between corridor method users and compliance disclosure regarding the corridor method. It can be seen that 84 out of 129 (i.e. 65.12%) compliance disclosures are

from corridor method users. Moreover, only 7 corridor method users do not have compliance disclosure and they claim that the removal of corridor method does not have material effects on them. Among them, 2 firms give the reasonable reasons that they have limited defined benefit plans and most defined contribution plans. Hence, the quality of the reporting seems to be good. Concerning the non-corridor method users, the change to IAS 19R may not affect them⁴⁰, thus they do not need to restate the comparative information about corridor method.

Table 29. Relationship between compliance disclosure and corridor method users

	Non_CM		CM		Total	
Non-Compliance D	64	90.14%	7	9.86%	71	100%
Compliance D	45	34.88%	84	65.12%	129	100%
Total	109	54.5%	91	45.5%	200	100%
Pearson chi2(1) = 56.388 Pr = 0.000						

Note: Chi-square is employed to investigate the effects of different countries on compliance disclosure regarding the corridor method. ***Significant at the 0.01 level (2-tailed), **Significant at the 0.05 level (2-tailed), *Significant at 0.1 level (2-tailed). The Non-CM means the non-corridor method users, which stands for firms that do not use the corridor method to recognize actuarial gains and losses; while the CM means corridor method users.

Table 30 presents the distribution of compliance disclosures of corridor method users among different countries. The results show that most corridor method users are from Sweden, while they are less likely to be Italian firms. However, since most corridor method users have compliance disclosure and corridor method users who do not have compliance disclosures are evenly distributed among countries, the country effect on compliance disclosure of corridor method users is not significant.

⁴⁰ Some of the non-corridor method users also have the restatement of comparative information because they are affected by the past service.

Table 30. The distribution of compliance disclosure of corridor method users among different countries

	Non-Compliance D		Compliance D		Total	
Germany	2	28.57%	21	25%	23	25.27%
France	1	14.29%	10	11.9%	11	12.09%
Italy	2	28.57%	21	25%	23	25.27%
Sweden	2	28.57%	32	38.1%	34	37.36%
Total	7	100%	84	100%	91	100%

Pearson $\chi^2(3) = 0.252$ Pr = 0.969

Note: Chi-square is employed to investigate the effects of different countries on compliance disclosure regarding the corridor method. ***Significant at the 0.01 level (2-tailed), **Significant at the 0.05 level (2-tailed), *Significant at 0.1 level (2-tailed).

The results of Table 31 suggest that the industry does not have a significant effect on the compliance disclosure of corridor method users. However, it can be seen from the table that all the corridor method users in the field of Other industries in Primary and Secondary sectors have compliance disclosures. Moreover, most corridor method users are from the industry field of Machinery, while the field of Other service has less corridor method users.

Table 31. The distribution of compliance disclosure of corridor method users among different industries

	Non-Compliance D		Compliance D		Total	
Chemical	1	14.29%	9	10.71%	10	10.99%
Machinery	3	42.86%	32	38.1%	35	38.46%
Other industries in Tertiary sector	2	28.57%	17	20.24%	19	20.88%
Other service	1	14.29%	8	9.52%	9	9.9%
Other industries in Primary & Secondary sectors	0	0.00%	18	21.43%	18	19.78%
Total	7	100%	84	100%	91	100%

Pearson $\chi^2(4) = 1.976$ Pr = 0.74

Note: Chi-square is employed to investigate the effects of different industries on compliance disclosure about corridor method. ***Significant at the 0.01 level (2-tailed), **Significant at the 0.05 level (2-tailed), *Significant at 0.1 level (2-tailed).

Table 32 shows the distribution of compliance disclosure of corridor method users with different ownership concentration. More specifically, the test variables: ownership concentration (i.e. in Panel A) and large ownership (i.e. in Panel B) have been enrolled. The ownership concentration (i.e. firms with under the mean value ownership concentration and others) as well as the large ownership (i.e. firms with large ownership and firms without large ownership) have been divided into two parts in order to make the comparison of the effects of different ownership concentration on the compliance disclosure of corridor method users.

The results of Table 32 suggest no significant difference between compliance disclosure of corridor method users for firms with different ownership concentration.

Table 32. Descriptive statistics

Panel A. Comparison for ownership concentration of corridor method users					
Variables	Firms with higher ownership concentration	Mean	Firms with lower ownership concentration	Mean	Mean Diff
Compliance_D	47	0.936	44	0.909	0.027

Panel B. Comparison for large ownership of corridor method users					
Variables	Firms with Large ownership	Mean	Firms without Large ownership	Mean	Mean Diff
Compliance_D	49	0.939	42	0.905	0.034

Note: The observation includes 91 companies that have used the corridor method before adopting the IAS 19R. **Large** means the large ownership, it equals 1 if an entity's ownership concentration is more than average of all entities' ownership concentration, it equals 0 if otherwise; **Compliance_D** means the compliance disclosure, it equals 1 if a firm has compliance disclosure about the corridor method, otherwise, it equals 0; the **firms with less ownership concentration** are the firms have the under mean value ownership concentration, otherwise they are considered to be **firms with more ownership concentration**.

6.2.2.2 Regression results

The logit regression results concerning the determinants of compliance disclosure about corridor method have been shown in Table 33.

Hypothesis 8 predicts a relationship between ownership concentration and compliance disclosure regarding the corridor method of corridor method users. In order to examine the effects of ownership concentration on compliance disclosure, the ownership concentration (OC) and large ownership (Large) have been used in this regression as test variables. However, neither of them has a significant effect on the compliance disclosure of corridor method users. Thus, the results reveal that the ownership concentration does not affect the compliance disclosure of the corridor method users. This result is different from the results of Glaum et al. (2013) who study the IAS 36 and IFRS 3 with a sample of 357 European firms in 2005, and find that there is an inverted U-shaped association between compliance disclosure and ownership concentration. However, even though there is a relationship between compliance disclosure and ownership concentration, the compliance disclosure regarding the corridor method is only a tiny part of compliance disclosure. Moreover, the different research objects, samples, and periods could be the reason for the different findings. Furthermore, there is always a distance between theory and practice which also makes the research on application of accounting principles become meaningful.

In addition, it is found that firm size has positive and significant effects (at the level of 0.05) on compliance disclosure of corridor method users. Thus, the results of Table 33 indicate that small companies tend not to have compliance disclosure. Additionally, firms in Other industries in Primary and Secondary sectors are more likely to have compliance disclosures about the corridor method than firms in the field of Chemical.

Table 33. The determinants of compliance disclosure about corridor method

VARIABLES	m1 Compliance_D
OC	0.0161 (0.495)
Large	-0.772 (-0.528)

Table 33. Continued

VARIABLES	m1 Compliance_D
TA_	1.011** (2.174)
LEV	-2.840 (-0.725)
ROE	0.00206 (0.133)
O. Chemical	-
Other service	0.745 (0.357)
Machinery	1.490 (0.964)
Other_Psector	18.12*** (12.83)
Other_Tertiary sectors	1.369 (0.821)
Secrecy	-0.00652 (-0.374)
Constant	4.932 (1.502)
Observations	88
Pseudo R2	0.1831

Robust z-statistics in parentheses

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

This table shows the regression results examining the determinants of compliance disclosure regarding the corridor method. The observation includes 200 companies with 50 firms each from Sweden, Italy, Germany and France. The observation is obtained from the annual reports in the year the 200 firms first adopted the IAS 19R and one year previously. The **Compliance_D** examines whether a firm has compliance disclosure regarding the corridor method, which equals 1 if the firm has compliance disclosure regarding the corridor method, otherwise it equals 0; the **OC** means the ownership concentration; the **Large** means the large ownership, it equals 1 if an entity's ownership concentration is more than the average of all entities' ownership concentration, it equals 0 if otherwise; the **TA_** means the logarithm of total assets, and its currency is million Euros, which has been winsorized at 1%; the **NE_** means the logarithm of number of

employees; the **LEV** means the leverage which is calculated as the total debts divided by total assets and has been winsorized at 1%; the **PLEV** means the proxy of leverage and has been winsorized at 1%; the **E** means the equity and its currency is million Euros; the **ROE** means the return of shareholders' earnings which has been winsorized at 1%; the **ROEN** means the ROE using net income and it has been winsorized at 1%; **Chemical** examines whether the firm is in the field of Chemistry; **Other service** examines whether the firm is in the field of other service; the **Machinery** examines whether the firm is in the field of Machinery; **Other_Psector** examines whether the firm is in the field of Other industries in Primary and Secondary sectors; **Other_Tertiary sectors** examines whether the firm is in the field of Other industries in Tertiary sectors; **Secrecy** examines the effects of culture on compliance disclosure about the corridor method.

Table 34 presents the robustness check for determinants of compliance disclosure regarding the corridor method, in which the logarithm of total assets has been replaced by the logarithm of number of employees, the PLEV is used instead of leverage. Moreover, ROEN replaces ROE to assess the profitability. Furthermore, uncertain avoidance (UA), power distance (PD) and individuals (IND) are used to assess the culture effects on compliance disclosure.

The firm size continues to have positive effects on the compliance disclosure regarding the corridor method. Moreover, compared with firms in the field of Chemical, firms in Other industries in Primary and Secondary sectors are more likely to have compliance disclosure about the corridor method. Furthermore, neither the ownership concentration nor the large ownership have significant effects on the compliance disclosure regarding the corridor method.

Thus, this robustness check supports Hypothesis 8, while claiming that there is no relationship between ownership concentration and the compliance disclosure regarding the corridor method.

Table 34. The robustness check for determinants of compliance disclosure about corridor method

VARIABLES	m1 Compliance_D
OC	0.0251 (0.696)
Large	-1.601 (-0.798)
NE_	1.166** (2.430)
PLEV	0.0712 (0.0879)
ROEN	0.00170 (0.367)
O. Chemical	-
Other service	0.476 (0.272)
Machinery	0.996 (0.612)
Other_Psector	17.49*** (10.84)
Other_Tertiary sectors	1.314 (0.591)
UA	-0.0189 (-0.467)
PD	0.0465 (0.629)
IND	-0.0233 (-0.138)
Constant	7.379 (0.818)
Observations	91
Pseudo R2	0.2781

Robust z-statistics in parentheses

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

This table shows the robustness check for determinants of compliance disclosure regarding the corridor method. This robustness check uses NE_ to replace TA_, and employs PLEV instead of LEV. Moreover, the ROE is replaced by ROEN, the Secrecy has been replaced by UA, PD and IND. The observation includes 200 companies with 50 firms each from Sweden, Italy, Germany and France. The observation is obtained from the annual reports in the year the 200 firms first adopted the IAS 19R and one year previously. The **Compliance_D** examines whether a firm has compliance disclosure regarding the corridor method, which equals 1 if the firm has compliance disclosure about the corridor method, otherwise it equals 0; the **OC** means the ownership concentration; the **Large** means the large ownership, it equals 1 if an entity's ownership concentration is more than average of all entities' ownership concentration, it equals 0 otherwise; the **TA_** means the logarithm of total assets, and its currency is million Euros, which has been winsorized at 1%; the **NE_** means the logarithm of number of employees; the **LEV** means the leverage, which is calculated as the total debts divided by total assets and has been winsorized at 1%; the **PLEV** means the proxy of leverage and has been winsorized at 1%; the **E** means the equity and its currency is million Euros; the **ROE** means the return of shareholders' earnings which has been winsorized at 1%; the **ROEN** means the ROE using net income and it has been winsorized at 1%; **Chemical** examines whether the firm is in the field of Chemistry; **Other service** examines whether the firm is in the field of other service; the **Machinery** examines whether the firm is in the field of Machinery; **Other_Psector** examines whether the firm is in the field of Other industries in Primary and Secondary sectors; **Other_Tertiary sectors** examines whether the firm is in the field of Other industries in Tertiary sectors; **UA** examines the uncertainty avoidance of culture; the **PD** examines the power distance of culture; the **IND** investigates the individual level of culture.

6.2.3 Additional tests

Both the compliance disclosure regarding the corridor method and the DAS are disclosures of pension information, thus this section examines whether there is a relationship between DAS and compliance disclosure regarding the corridor method. The results of this section will also show the application of IAS 19R.

The results of Tables 35 and 36 present the association between DAS and compliance disclosure regarding the corridor method. Table 35 suggests that firms that do not have compliance disclosures regarding the corridor method tend to have lower DAS, Text_D and Quanti_D than firms have compliance disclosure regarding the corridor method.

Moreover, Table 36 reveals that there is a positive relationship between DAS and Compliance_D. Thus, the results indicate that firms with higher DAS tend to

comply with IAS 19R and restate the comparative information about corridor method (i.e. the compliance disclosure about corridor method).

Table 35. The descriptive statistics of the relationship between DAS and Compliance_D

Variables	Non-		Mean	Mean	Mean Diff
	Compliance_D	Compliance_D			
DAS	71	129	0.235	0.279	-0.044***
Text_D	71	129	0.385	0.454	-0.069**
Quanti_D	71	129	0.305	0.359	-0.054**
Sensiti_D	71	129	0.016	0.023	-0.008

Note: The observation includes 200 companies with 50 firms each from Sweden, Italy, Germany and France. The **Compliance_D** examines whether a firm has compliance disclosure regarding the corridor method, which equals 1 if the firm has compliance disclosure regarding the corridor method, otherwise it equals 0; the **DAS** means the disclosure level of actuarial assumptions; the **Sensiti_D** means the sensitivity disclosure of actuarial assumptions; the **Text_D** means the textual disclosure of actuarial assumptions; the **Quanti_D** means the quantitative disclosure of actuarial assumptions.

Table 36. The association between DAS and Compliance_D

VARIABLES	m1	m2
	Compliance_D	Compliance_D
Text_D		1.057 (1.353)
Quanti_D		1.502 (1.451)
Sensiti_D		1.174 (0.364)
DAS	3.693*** (2.582)	
Observations	200	200
R-squared	0.0275	0.0278

t-statistics in parentheses

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

This table shows the regression results examining the relationship between DAS and the compliance disclosure regarding the corridor method. The observation includes 200

companies with 50 firms each from Sweden, Italy, Germany and France. The observation is obtained from the annual reports in the year the 200 firms first adopted the IAS 19R and one year previously. The **Compliance_D** examines whether a firm has compliance disclosure regarding the corridor method, which equals 1 if the firm has compliance disclosure regarding the corridor method, otherwise it equals 0; the **DAS** means the disclosure level of actuarial assumptions; the **Sensiti_D** means the sensitivity disclosure of actuarial assumptions; the **Text_D** means the textual disclosure of actuarial assumptions; the **Quanti_D** means the quantitative disclosure of actuarial assumptions.

6.2.4 Summary

To conclude, this section presents examinations of the corridor method. More specifically, the determinants of using the corridor method and the determinants of having compliance disclosures about corridor method are examined.

The results reject Hypotheses 6 and 7 and claim that neither the leverage nor the ownership concentration have an effect on the use of the corridor method. Moreover, Hypothesis 8 is supported by the results as there is no relationship between ownership concentration and the compliance disclosure of corridor method users.

In addition, firms with more actuarial gains and losses tend to use the corridor method. Furthermore, big firms as well as firms with higher DAS tend to have compliance disclosure of corridor method.

Thus, the results above show the application of the IAS 19R. Moreover, this is an empirical study about the compulsory abolishment of an accounting choice. Furthermore, to the best of my knowledge, this is the first study relating to the compliance disclosure of corridor method.

6.3 The effects of adopting the IAS 19R

This part presents the empirical results of the effects of adopting the IAS 19R on corridor method users. More specifically, I investigate whether corridor method users change their discount rate (Hypothesis 9), decrease their dividend payments (Hypothesis 10) and increase their leverage (Hypothesis 11) to mitigate the effects of removing the corridor method. Furthermore, I examine whether corridor method users tend to be early adopters of IAS 19R (Hypothesis 12).

Even though all the hypotheses focus on the effects of removing the corridor method, they are based on different numbers of observations. For Hypotheses 9,

10 and 11, the test variables (i.e. discount rate, dividend payments and leverage) need a long period of time to reveal their changes, thus these analyses are based on 8-year observations of the 200 European firms (that is, from 2008 to 2015). For Hypothesis 12, however, the focus is on the early adoption of IAS 19R, thus only a 1-year date (i.e. the 200 European firms' annual report in the year they adopt the IAS 19R) is used to analyze it.

This section will begin with the descriptive analysis and then the regression results and summary of this section will be shown. As stated earlier, total assets, leverage, proxy of leverage, ROE, ROEN and profit margin are winsorized at the 1% level.

6.3.1 Descriptive statistics of corridor method users and early adopters of IAS 19R

Table 37 presents the descriptive statistics regarding dependent variables. Panel A makes a comparison between corridor method users and non-corridor method users, which shows that the non-corridor method users are more likely to be the early adopters of the IAS 19R than corridor method users. Moreover, the non-corridor method users tend to have higher dividend payments and leverage than corridor method users.

Panel B reports the comparison between the IAS 19 and IAS 19R. The results show that the discount rate as well as leverage under the IAS 19 is significantly higher than that under IAS 19R.

The results of Table 37 indicate that the use of corridor method affects firms' decisions on the amount of dividend payments, the choice of leverage and whether to adopt the IAS 19R earlier (i.e. before 2013). Moreover, the dividend payment and leverage tend to decrease after adopting the IAS 19R.

Table 37. The descriptive statistics

Panel A					
Variables	Non-CM	Mean	CM	Mean	Mean Diff
EA	109	0.156	91	0.055	0.101**
DR	784	3.925	695	4.038	-0.113
DP_R	547	0.409	519	0.181	0.228***
LEV	803	0.206	690	0.194	0.012*

Table 37. Continued**Panel B**

Variables	IAS 19	Mean	IAS 19R	Mean	Mean Diff
DR	903	4.523	576	3.125	1.398***
DP_R	647	0.3	419	0.295	0.006
LEV	901	0.216	592	0.177	0.038***

Note: The observation includes 200 companies with 50 firms each from Sweden, Italy, Germany and France. The **EA** means the early adopter of IAS 19R, which adopted the IAS 19R before 2013; the **DR** means the discount rate; the **DP_R** stands for the dividend payments, which equals dividend payments divided by revenue and has been winsorized at 1% level; the **LEV** means the leverage which is calculated as the total debts divided by total assets.

Table 38 presents the effects of country on the early adopters of IAS 19R. It can be seen that there is a close relationship between the early adopters of IAS 19R and firms from different countries. Among the sample, French firms are more likely to adopt the IAS 19R early, while Swedish firms are less likely to become early adopters.

Table 38. The distribution of early adopters by country

	Non-EA		EA		Total	
Germany	47	26.4%	3	13.64%	50	25%
France	41	23.03%	9	40.91%	50	25%
Italy	42	23.6%	8	36.36%	50	25%
Sweden	48	26.97%	2	9.09%	50	25%
Total	178	100%	22	100%	200	100%

Pearson $\chi^2(3) = 15.1175$ Pr = 0.002

Note: Chi-square is used to examine whether there is a relationship between country and early adopter of corridor method. ***Significant at the 0.01 level (2-tailed), **Significant at the 0.05 level (2-tailed), *Significant at 0.1 level (2-tailed).

Table 39 shows that firms in the field of machinery are more likely to early adopt the IAS 19R, while firms in the field of Other service and Chemical are less likely to be early adopters of the IAS 19R. However, the results claim no significant association between early adopters of IAS 19R and industry.

Table 39. The distribution of early adopters of the IAS 19R among industries

	Non-EA		EA		Total	
Chemical	22	12.36%	3	13.64%	25	12.5%
Machinery	58	32.58%	7	31.82%	65	32.5%
Other Tertiary industry	38	21.35%	4	18.18%	42	21%
Other service	30	16.85%	3	13.64%	33	16.5%
Other Primary & Secondary industries	30	16.85%	5	22.73%	35	17.5%
Total	178	100%	22	100%	200	100%
Pearson $\chi^2(4) = 0.6314$ Pr = 0.96						

Note: Chi-square is used to examine whether there is a relationship between industry and early adopter of corridor method. ***Significant at the 0.01 level (2-tailed), **Significant at the 0.05 level (2-tailed), *Significant at 0.1 level (2-tailed).

6.3.2 Regression results

Table 40 displays the OLS regression results examining the determinants of discount rate. More specifically, this examination principally focuses on whether corridor method users change their discount rate after adopting the IAS 19R. Thus, the coefficient of CM*IAS 19R is of special interest. However, the results show no significant effects of CM*IAS 19R on the discount rate, which indicates that corridor method users do not change their discount rate after the adoption of IAS 19R.

Moreover, the results suggest that the employment of IAS 19R decreases the discount rate. Since interest rates have generally been much lower after the year of adopting the IAS 19R than the years before, thus the discount rate is decreased under the IAS 19R. In addition, large firms as well as firms with higher profitability are more likely to use a higher discount rate. Additionally, compared with German firms, firms from Sweden are more likely to choose a lower discount rate.

Table 40. The determinants of discount rate

VARIABLES	m1 DR
CM	0.133 (1.628)
IAS 19R	-1.459*** (-14.64)
CMIAS 19R	0.109 (0.730)
LEV	-0.0932 (-0.360)
TA_	0.110*** (5.535)
ROE	0.00303** (2.239)
O. Germany	-
France	-0.0224 (-0.233)
Italy	-0.0299 (-0.312)
Sweden	-0.206** (-2.150)
O. Chemical	-
Machinery	-0.0786 (-0.616)
Other service	0.0855 (0.632)
Other_Psector	-0.0709 (-0.520)
Other_Tertiary sectors	-0.00257 (-0.0195)
Constant	3.721*** (20.44)
Observations	1,345
R-squared	0.249

t-statistics in parentheses

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

This table shows the regression results examining the determinants of discount rate (**DR**). The observation includes 200 companies with 50 firms each from Sweden, Italy, Germany and France. The observation is obtained from the annual reports in the year from 2008 to 2015. The **CM** examines whether the firm is a corridor method user, it equals 1 if it is, otherwise it equals 0; the **IAS 19R** measures whether the firm uses the IAS 19R, it equals 1 if it is, otherwise it equals 0; the **CMIAS 19R** is the interaction between the CM and the IAS 19R, which is the most interesting variable for this difference in difference test; the **TA_** means the logarithm of total assets, and its currency is million Euros; the **LEV** means the leverage which is calculated as the total debts divided by total assets; the **PLEV** means the proxy of leverage; the **ROE** means the return of shareholders' earnings; the **ROEN** means the ROE using net income; the **Machinery** examines whether the firm is in the field of Machinery; **Other_Psector** examines whether the firm is in the field of Other industries in Primary and Secondary sectors; **Other_Tertiary sectors** examines whether the firm is in the field of Other industries in Tertiary sectors; **Other service** examines whether the firm is in the field of other service; **Chemical** examines whether the firm is in the field of Chemistry.

The OLS regression results for the robustness check regarding the determinants of discount rate are shown in Table 41. The logarithm of number of employees (**NE_**) has been employed to replace the logarithm of total assets to assess the firm size. Moreover, the **ROEN** is used to replace the **ROE** when assessing the profitability. After the changes, the coefficient of **CM*IAS 19R** continues to be non-significant. Thus, the robustness check supports Hypothesis 9 and claims no association between the discount rate and the removal of corridor method for corridor method users.

In addition, the **IAS 19R** continues to have significant and negative effects on the discount rate while firm size continues to have significant and positive effects on the discount rate. Additionally, compared with German firms, Swedish firms are more likely to have a lower discount rate.

Table 41. The robustness check for the determinants of discount rate

VARIABLES	m1 DR
CM	0.0947 (1.152)
IAS 19R	-1.460*** (-14.73)
CMIAS 19R	0.0835 (0.541)
PLEV	-0.0375 (-0.598)
NE_	0.119*** (6.474)
ROEN	0.00102 (0.665)
Germany	-
France	-0.0811 (-0.841)
Italy	0.0196 (0.191)
Sweden	-0.221** (-2.286)
Chemical	-
Machinery	-0.135 (-1.031)
Other service	0.0101 (0.0724)
Other_Psector	-0.139 (-1.002)
Other_Tertiary Sector	-0.0572 (-0.423)
Constant	3.637*** (18.19)
Observations	1,296
R-squared	0.253

t-statistics in parentheses

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

This table shows the regression results of the robustness check for the determinants of discount rate (**DR**). The observation includes 200 companies with 50 each from Sweden, Italy, Germany and France. The observation is obtained from the annual reports in the years from 2008 to 2015. The **CM** examines whether the firm is a corridor method user, it equals 1 if it is, otherwise it equals 0; the **IAS 19R** measures whether the firm use the IAS 19R, it equals 1 if it is, otherwise it equals 0; the **CMIAS 19R** is the interaction between the CM and the IAS 19R, which is the most interesting variable for this difference in difference test; the **TA_** means the logarithm of total assets, and its currency is million Euros; the **LEV** means the leverage which is calculated as the total debts divided by total assets; the **PLEV** means the proxy of leverage which has been winsorized at 1%; the **ROE** means the return of shareholders' earnings; the **ROEN** means the ROE using net income; the **Machinery** examines whether the firm is in the field of Machinery; **Other_Pssector** examines whether the firm is in the field of Other industries in Primary and Secondary sectors; **Other_Tertiary sectors** examines whether the firm is in the field of Other industries in Tertiary sectors; **Other service** examines whether the firm is in the field of other service; **Chemical** examines whether the firm is in the field of Chemistry.

Table 42 shows OLS regression results regarding the determinants of dividend payments. The coefficient of CM*IAS 19R is important in this table, as it examines Hypothesis 10: whether the dividend payments of corridor method users change after the adoption of the IAS 19R. Since there is no significant association between the CM*IAS 19R and dividend payments, Hypothesis 10 is rejected, which suggests that the corridor method users do not change their dividend payments after the removal of the corridor method (i.e. adopting the IAS 19R).

However, it is found that the CM has significant and negative effects on dividend payments, which suggests that corridor method users have lower dividend payments than non-corridor method users before the adoption of IAS 19R. Moreover, column m2 shows the association between the users of the corridor method and dividend payments without any effects of IAS 19R; the results suggest that firms that use the corridor method tend to have less dividend payments. But after the adoption of the IAS 19R, the corridor method users do not have any significant effects on dividend payments and the relationship becomes positive. Thus, the IAS 19R reduces the differences of dividend payments between corridor method users and non-corridor method users. A possible reason could be that the removal of the corridor method leads to immediate recognition of actuarial gains and losses in other comprehensive income which directly affects the profit and loss. Moreover, that firms which have previously used the corridor method have to face their "real" pension liabilities/assets (i.e. the corridor method allows conditional deferred recognition of actuarial gains and losses). Therefore, they

have to make the dividend payments based on their “real” profit, which may end up at nearly the same level as other firms (i.e. non-corridor method users). Moreover, firm size has positive effects on the dividend payments, which suggests that big firms tend to have more dividend payments. In addition, French firms and Italian firms are found to have more dividend payments than German firms.

Table 42. The determinants of dividend payables

VARIABLES	m1	m2
	DP_R	DP_R
CM	-0.297*** (-2.829)	-0.254*** (-3.327)
IAS 19R	-0.0533 (-0.371)	
CMIAS 19R	0.0963 (0.631)	
LEV	-0.493* (-1.813)	-0.503* (-1.833)
TA_	-0.0203 (-0.754)	-0.0205 (-0.770)
ROE	-0.00074 (-0.316)	-0.00079 (-0.333)
Growth	-0.00037 (-0.451)	-0.00039 (-0.478)
O. Germany	-	
France	0.288** (2.390)	0.287** (2.363)
Italy	0.428*** (3.318)	0.427*** (3.286)
Sweden	0.0577 (0.939)	0.0569 (0.908)
O. Chemical	-	
Machinery	0.0605 (0.451)	0.0586 (0.440)
Other service	-0.195* (-1.679)	-0.192* (-1.734)
Other_Pssector	0.0924 (0.650)	0.0912 (0.662)

Table 42. Continued

VARIABLES	m1	m2
	DP_R	DP_R
Other_Tertiary sectors	0.0263 (0.191)	0.0265 (0.194)
Constant	0.522** (1.986)	0.503* (1.959)
Observations	809	809
R-squared	0.045	0.045

t-statistics in parentheses

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

This table shows the regression results examining the determinants of dividend payables. Column m1 shows the OLS results of model 6, focusing on the DID method of effects of both adopting IAS 19R and the use of corridor method on the dividend payments, while column m2 shows the OLS results without concerning the effects of IAS 19R and the DID method on the dividend payments. The **DP_R** is employed as the dependent variable to avoid the effects of firm size which equals a firm's dividend payments divided by its revenue, and it has been winsorized at 1% level. The observation includes 200 companies with 50 firms each from Sweden, Italy, Germany and France. The observation is obtained from the annual reports from the years 2008 to 2015. The **CM** examines whether the firm is a corridor method user, it equals 1 if it is, otherwise it equals 0; the **IAS 19R** measures whether the firm uses the IAS 19R, it equals 1 if it is, otherwise it equals 0; the **CMIAS 19R** is the interaction between the CM and the IAS 19R, which is the most interesting variable for this difference in difference test; the **LEV** means the leverage, which is calculated as the total debts divided by total assets which has been winsorized at 1%; the **TA_** means the logarithm of total assets, which has been winsorized at 1%, and its currency is million Euros; the **ROE** means the return of shareholders' earnings and it has been winsorized at 1%; the **Growth** measures the firm growth in sales which has been winsorized at 1%; the **Chemical** examines whether the firm is in the field of Chemistry; the **Machinery** examines whether the firm is in the field of Machinery; **Other service** examines whether the firm is in the field of other service; **Other_Psector** examines whether the firm is in the field of Other industries in Primary and Secondary sectors; **Other_Tertiary sectors** examines whether the firm is in the field of Other industries in Tertiary sectors.

Table 43 presents the robustness check for the determinants of dividend payables. In the robustness check, the leverage has been replaced by PLEV, the ROE has

been replaced by ROEN. Moreover, the logarithm of total assets has been replaced by the logarithm of number of employees.

The results still reject Hypothesis 10 due to the insignificant coefficient of CM*IAS 19R. Moreover, the corridor method users continues to have negative effects on the dividend payments. In addition, big firms tend to have more dividend payments. Furthermore, firms from France as well as firms from Italy continue to have more dividend payment than Germany firms. However, the leverage begins to have negative effects on dividend payments.

Table 43. The robustness check for the determinants of dividend payables

VARIABLES	m1 DP_R	m2 DP_R
CM	-0.331*** (-2.956)	-0.260*** (-3.300)
IAS 19R	-0.0932 (-0.631)	
CMIAS 19R	0.157 (0.979)	
PLEV	-0.194*** (-3.030)	-0.189*** (-3.060)
NE_	-0.0216 (-0.774)	-0.0216 (-0.778)
ROEN	-0.00113 (-0.380)	-0.00114 (-0.387)
Growth	-0.00055 (-0.652)	-0.00058 (-0.680)
O. Germany	-	
France	0.310** (2.467)	0.308** (2.436)
Italy	0.443*** (3.266)	0.440*** (3.218)
Sweden	0.0589 (0.869)	0.0577 (0.837)

Table 43. Continued

VARIABLES	m1	m2
	DP_ R	DP_ R
O. Chemical	-	
Machinery	0.0723 (0.525)	0.0671 (0.488)
Other service	-0.175 (-1.478)	-0.171 (-1.490)
Other_Psector	0.0991 (0.682)	0.0958 (0.674)
Other_Tertiary sectors	0.0307 (0.216)	0.0293 (0.206)
Constant	0.593* (1.930)	0.551* (1.860)
Observations	787	787
R-squared	0.049	0.048

t-statistics in parentheses

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

This table shows the regression results of the robustness check for the determinants of dividend payables (**DP_R**), which employs **NE_** instead of **WTA_** to assess the firm size. Column m1 shows the OLS results of model 6, focusing on the DID method of effects of both adopting IAS 19R and the use of the corridor method on the dividend payments, while column m2 shows the OLS results without concerning the effects of IAS 19R and DID method on the dividend payments. The **DP_R** is employed as the dependent variable to avoid the effects of firm size, which equals a firm's dividend payments divided by its revenue. The observation includes 200 companies with 50 firms each from Sweden, Italy, Germany and France. The observation is obtained from the annual reports in the years from 2008 to 2015. The **CM** examines whether the firm is a corridor method user, it equals 1 if it is, otherwise it equals 0; the **IAS 19R** measures whether the firm use the IAS 19R, it equals 1 if it is, otherwise it equals 0; the **CMIAS 19R** is the interaction between the CM and the IAS 19R, which is the most interesting variable for this difference in difference test; the **PLEV** means the proxy of leverage which has been winsorized at 1%; the **NE_** means the logarithm of number of employees; the **ROE** means the return of shareholders' earnings and it has been winsorized at 1%; the **ROEN** means the ROE using net income which has been winsorized at 1%; the **Growth** measures the firm growth in sales, and it has been winsorized at 1%; the **Chemical** examines whether the firm is in the field of Chemistry; the **Machinery** examines whether the firm is in the field of Machinery; **Other**

service examines whether the firm is in the field of other service; **Other_Psector** examines whether the firm is in the field of Other industries in Primary and Secondary sectors; **Other_Tertiary sectors** examines whether the firm is in the field of Other industries in Tertiary sectors.

Table 44 presents the comparison between leverage under IAS 19 (LEV_19) and the restated leverage under IAS 19R (LEV_restated). Both LEV_19 and LEV_restated are leveraged for the same year: the year before adopting the IAS 19R. However, the LEV_19 is the leverage calculated according to IAS 19; while the LEV_restated is calculated according to IAS 19R. Moreover, I match the LEV_restated with the LEV_19, thus each pair is for same company in the same year but under different pension accounting standards. Therefore, the comparison between LEV_restated and LEV_19 is considered to show the effects of removing the corridor method on leverage.

It can be seen from Panel A that the observations of leverage include 37 non-corridor method users and 75 corridor method users. Moreover, neither the originally reported leverage nor the restated leverage shows a difference between corridor method users and non-corridor method users.

Panel B shows that the mean value, standard error, standard deviation, median value and the maximum value of LEV_restated are all higher than that of LEV_19. Moreover, the t-test shows significant difference between the mean value of LEV_19 and LEV_restated, which suggests that the adopting of IAS 19R significantly increases the leverage.

Panel C compares the non-corridor method users' leverage under IAS 19 and IAS 19R, which claims that the restated leverage of non-corridor method users is nearly the same as original reported leverage under IAS 19. Thus, the employment of IAS 19R does not change non-corridor method users' leverage.

Panel D presents the comparison between IAS 19 and IAS 19R on leverage of corridor method users. The results of Panel D suggest that the IAS 19R significantly increases corridor method users' leverage, which supports Hypothesis 11.

To conclude, even though the results of Panel D support Hypothesis 11, which suggests that corridor method users increase their leverage when adopting the IAS 19R, the non-corridor method users' leverage does not seem to be affected by the IAS 19R.

Table 44. Comparison of leverage under IAS 19 and IAS 19R

Panel A. Comparison between corridor method users and non-corridor method user on leverage

Variables	Non-CM	Mean	CM	Mean	Mean Diff
LEV_restated	37	0.183	75	0.19	-0.007
LEV_19	37	0.18	75	0.177	0.003

Note: The observation includes 200 companies with 50 firms each from Sweden, Italy, Germany and France. The Non-CM means the non-corridor method users, which stands for firms that do not use the corridor method to recognize actuarial gains and losses; while the CM means corridor method users; the LEV means the leverage, which is measured as the total debts divided by total assets and has been winsorized at 1%; the LEV_19 stands for the leverage under IAS 19; the LEV_restated means the leverage for the year before adopting the IAS 19R that has been restated according to the IAS 19R.

Panel B. Comparison of leverage under IAS 19 and IAS 19R

Variable	Obs	Mean	Std. Err.	Std. Dev.	Median	Min	Max	[95% Interval]	Conf.
LEV_restated	112	0.187	0.012	0.131	0.178	0.001	0.595	0.163	0.211
LEV_19	112	0.178	0.011	0.123	0.174	0.001	0.592	0.155	0.201
diff	112	0.009	0.002	0.029	0.004	0	0.003	0.004	0.015

mean(diff) = mean(LEV_restated-LEV_19) t = 3.406
 Ho: mean(diff) = 0 degrees of freedom = 111
 Ha: mean(diff) != 0
 Pr(T > t) = 0.0009

Note: This table compares the leverage in the same year but under different pension standards (i.e. IAS 19 and IAS 19R). The data are obtained in the year before firms adopted the IAS 19R (i.e. under IAS 19) and since only 112 firms have restated their pension information that relates to leverage, thus altogether 112 observations are included. The LEV means the leverage, which is measured as the total debts divided by total assets and has been winsorized at 1%; the LEV_19 stands for the leverage under IAS 19; the LEV_restated means the leverage for the year before adopting the IAS 19R that has been restated according to the IAS 19R.

Table 44. Continued

Panel C. Comparison of non-corridor method users' leverage under IAS 19 and IAS 19R						
Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
LEV_restated_NCM	37	0.183	0.022	0.131	0.139	0.227
LEV_19_NCM	37	0.18	0.021	0.131	0.137	0.225
diff	37	0.003	0.001	0.009	-0.001	0.005
mean(diff) = mean(LEV_restated_NCM–LEV_19_NCM)				t = 1.654		
Ho: mean(diff) = 0				degrees of freedom = 36		
Ha: mean(diff) ≠ 0						
Pr(T > t) = 0.058						

Note: This table compares the non-corridor method users' leverage in the same year but under different pension standards (i.e. IAS 19 and IAS 19R). The data are obtained in the year before firms adopted the IAS 19R (i.e. under IAS 19) and since only 37 non-corridor method users have restated their pension information that relates to leverage, thus altogether 37 observations are included. The LEV means the leverage, which is measured as the total debts divided by total assets and has been winsorized at 1%; the LEV_19_NCM stands for the non-corridor method users' leverage under the IAS 19; the LEV_restated_NCM means the non-corridor method users' leverage for the year before adopting the IAS 19R that has been restated according to the IAS 19R.

Panel D. Comparison of corridor method users' leverage under IAS 19 and IAS 19R						
Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
LEV_restated_CM	75	0.19	0.015	0.131	0.159	0.22
LEV_19_CM	75	0.177	0.014	0.121	0.149	0.205
diff	75	0.013	0.004	0.035	0.005	0.021
mean(diff) = mean(LEV_restated_CM–LEV_19_CM)				t = 3.143		
Ho: mean(diff) = 0				degrees of freedom = 74		
Ha: mean(diff) ≠ 0						
Pr(T > t) = 0.0024						

Note: This table compares the corridor method users' leverage in the same year but under different pension standards (i.e. IAS 19 and IAS 19R). The data are obtained in the year before firms adopted the IAS 19R (i.e. under IAS 19) and since only 74 corridor method users have restated their pension information relating to leverage, thus altogether 74 observations are included. The LEV means the leverage, which is measured as the total debts divided by total assets and has been winsorized at 1%; the LEV_19_CM stands for the corridor method users' leverage under IAS 19; the LEV_restated_CM means

the corridor method users' leverage for the year before adopting the IAS 19R that has been restated according to the IAS 19R.

In order to examine the determinants of leverage, 1150 observations from 2008 to 2015 are used. Moreover, the employment of 8 years' data for leverage analyzes the trend of changes of leverage from IAS 19 to IAS 19R in a longer period rather than the adopting period of IAS 19R.

It can be seen from Table 45 that the coefficient of CM*IAS 19R does not show significant effects on leverage, which suggests that corridor method users do not change much on their leverage after using the IAS 19R. However, it can be seen from Table 44 that, compared with the IAS 19, the adopting of IAS 19R increases corridor method users' leverage. Thus, the corridor method users increase their leverage when adopting the IAS 19R, but they do not significantly change their leverage after the application of IAS 19R in long run. Since Hypothesis 11 focuses on the leverage of corridor method users when adopting of IAS 19R, which is increased according to the results of Table 44, thus Hypothesis 11 is supported.

In addition, the coefficient of IAS 19R on leverage is found to be negative and significant. Furthermore, the results suggest big firms and firms with lower profitability tend to have higher leverage. Moreover, compared with firms from Germany, Swedish firms are more likely to have higher leverage.

Table 45. The determinants of leverage

VARIABLES	m1 LEV
CM	0.00232 (0.209)
IAS 19R	-0.0187* (-1.780)
CMIAS 19R	-0.0231 (-1.569)
PM	-0.00003 (-0.0875)
TA_	0.0228*** (11.70)
ROE	-0.00069*** (-3.401)
Growth	-0.00006 (-0.640)
Germany	-
France	0.00560 (0.500)
Italy	0.00053 (0.0515)
Sweden	0.0319*** (2.948)
Chemical	-
Machinery	-0.00028 (-0.0240)
Other service	-0.00509 (-0.362)
Other_Psector	-0.00197 (-0.139)
Other_Tertiary sectors	0.0138 (1.064)
Constant	0.0305 (1.506)
Observations	1,150
R-squared	0.126

t-statistics in parentheses

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

This table shows the regression results examining the determinants of leverage (**LEV**), which is calculated as total debts divided by total assets (TD/TA). The observation includes 200 companies with 50 firms each from Sweden, Italy, Germany and France. The observation is obtained from the annual reports in the years from 2008 to 2015. The **CM** examines whether the firm is a corridor method user, it equals 1 if it is, otherwise it equals 0; the **IAS 19R** measures whether the firm uses the IAS 19R, it equals 1 if it is, otherwise it equals 0; the **CMIAS 19R** is the interaction between the CM and the IAS 19R, which is the most interesting variable for this difference in difference test; the **PM** means the profit margin which has been winsorized at 1%; the **NE_** means the logarithm of number of employees; the **ROE** means the return of shareholders' earnings and has been winsorized at 1%; the **Growth** measures the firm growth in sales and it has been winsorized at 1%; **Chemical** examines whether the firm is in the field of Chemistry; the **Machinery** examines whether the firm is in the field of Machinery; **Other service** examines whether the firm is in the field of other service; **Other_Psector** examines whether the firm is in the field of Other industries in Primary and Secondary sectors; **Other_Tertiary sectors** examines whether the firm is in the field of Other industries in Tertiary sectors.

Table 46 presents the robustness check for the determinants of leverage. It employs the ROEN to replace ROE, the operating revenue to replace profit margin and the logarithm of number of employees instead of the logarithm of total assets.

The results continue to show that the leverage of corridor method users does not change after the employment of the IAS 19R. Moreover, the firms with bigger size and firms with lower profitability are more likely to have higher leverage. In addition, Swedish firms tend to have higher leverage than German firms. However, the negative and significant effects of IAS 19R on leverage is gone.

Table 46. The robustness check for the determinants of leverage

VARIABLES	m1 LEV
CM	0.0069 (0.628)
IAS 19R	-0.0144 (-1.330)
CMIAS 19R	-0.0256 (-1.627)
OR_A	-0.00008 (-1.084)
NE_	0.00000*** (2.744)
ROEN	-0.00067*** (-3.318)
Growth	-0.00008 (-0.687)
Germany	-
France	0.0175 (1.517)
Italy	0.0111 (0.979)
Sweden	0.0250** (2.210)
Chemical	-
Machinery	-0.00337 (-0.263)
Other service	-0.00578 (-0.388)
Other_Psector	-0.00233 (-0.160)
Other_Tertiary sectors	0.0127 (0.946)
Constant	0.182*** (12.02)
Observations	1,134
R-squared	0.036

t-statistics in parentheses

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

This table shows the regression results examining the robustness check for the determinants of leverage (**LEV**), which is calculated as total debts divided by total assets (TD/TA). The observation includes 200 companies with 50 firms each from Sweden, Italy, Germany and France. The observation is obtained from the annual reports in the years from 2008 to 2015. The **CM** examines whether the firm is a corridor method user, it equals 1 if it is, otherwise it equals 0; the **IAS 19R** measures whether the firm uses the IAS 19R, it equals 1 if it is, otherwise it equals 0; the **CMIAS 19R** is the interaction between the CM and the IAS 19R, which is the most interesting variable for this difference in difference test; the **OR_A** measures the operating revenue, which is calculated as the firm's operating revenue divided by the total assets and it has been winsorized at 1%; the **NE_** means the logarithm of number of employees; The **ROE** means the return of shareholders' earnings which has been winsorized at 1%; the **ROEN** means the ROE using net income and it has been winsorized at 1%; the **Growth** measures the firm growth in sales which has been winsorized at 1%; **Chemical** examines whether the firm is in the field of Chemistry; the **Machinery** examines whether the firm is in the field of Machinery; **Other service** examines whether the firm is in the field of other service; **Other_Psector** examines whether the firm is in the field of Other industries in Primary and Secondary sectors; **Other_Tertiary sectors** examines whether the firm is in the field of Other industries in Tertiary sectors.

The early adoption of the IAS 19R is allowed according to the IAS 19R (para. 172). Since the IAS 19R was issued in 2011 and has been put into use since 2013, firms can choose to adopt the IAS 19R in 2011, 2012 or 2013. Among the sample, 22 out of 200 firms chose to early adopt the IAS 19R (i.e. adopt the IAS 19R in 2011 or 2012). According to Norton (1988), early adopters thought the advantages of early adopting overweighed the costs. Moreover, studies on early adoption of pension accounting standards (e.g. Amir and Ziv 1997) claim that there is a positive market reaction to early adoption. However, the comparability of financial statements is affected by the long transition period between early adopters and late adopters (Norton 1988). Concerning the IAS 19R, it removes the corridor method. Thus, firms used to recognize actuarial gains and losses off-balance sheet have to immediately recognize actuarial gains and losses in other comprehensive income, which may cause volatility in equity and liabilities and further affects the market reaction and firms' future performance (e.g. dividend payments).

Table 47 displays the logit regression results regarding the determinants of early adopters of IAS 19R. The results show that the coefficient of corridor method users

is significant and negative at the level of 0.01, which supports Hypothesis 12 and suggests that corridor method users are less likely to early adopt the IAS 19R.

Furthermore, the *Compliance_D* is found to have positive effects on the EA; thus firms restated the pension information about corridor method are more likely to be early adopters of the IAS 19R. Since the restatements are due to the significant changes, thus only the firms that are significantly affected by the adoption of the IAS 19R tend to restate the information about corridor method. However, the *DAS* does not have significant effects on the EA even in column m2, which drops the *Compliance_D*.

Moreover, leverage as well as ROE have positive effects on the early adopters of IAS 19R, while the *TA_* has negative effects on the early adopters of IAS 19R. Thus, firms have higher leverage, more profitability and small firms are more likely to early adopt the IAS 19R. Additionally, compared with firms from Germany, French firms and Italian firms are more likely to early adopt the IAS 19R.

Table 47. The determinants of early adoption of the IAS 19R

VARIABLES	m1	m2
	EA	EA
CM	-0.201*** (-2.892)	-0.0969** (-2.047)
DAS	0.274 (0.989)	0.386 (1.389)
Compliance_D	0.199*** (2.862)	
LEV	0.254 (1.287)	0.230 (1.144)
TA_	-0.0421** (-2.565)	-0.0323** (-1.982)
ROE	0.00128 (1.580)	0.00107 (1.238)
O. Germany	-	-
France	0.114* (1.685)	0.113* (1.690)

Table 47. Continued

VARIABLES	m1 EA	m2 EA
Italy	0.147** (2.229)	0.152** (2.213)
Sweden	0.0118 (0.252)	0.00597 (0.121)
O. Chemical	-	-
Other service	-0.00524 (-0.0646)	-0.0298 (-0.370)
Machinery	0.00415 (0.0574)	0.0252 (0.344)
Other_Psector	0.0376 (0.408)	0.0428 (0.446)
Other_Tertiary sectors	-0.0347 (-0.438)	-0.0215 (-0.272)
Constant	0.177* (1.670)	0.156 (1.421)
Observations	190	190
Pseudo R2	0.145	0.088

Robust z-statistics in parentheses

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

This table shows the regression results examining the determinants of early adopters of IAS 19R (**EA**), the EA equals 1 if the firm is an early adopter of IAS 19R, otherwise it equals 0. Column m1 includes both Compliance_D and DAS, while column m2 only includes DAS to examine the determinants of early adopting the IAS 19R. The observation includes 200 companies with 50 firms each from Sweden, Italy, Germany and France. The observation is obtained from the annual reports in the year they first adopted the IAS 19R and one year previously. The **CM** examines whether the firm is a corridor method user, it equals 1 if it is, otherwise it equals 0; the **DAS** measures the disclosure level of actuarial assumptions; the **Compliance_D** measures whether a firm has compliance disclosure regarding the corridor method, it equals 1 if a firm has compliance disclosure regarding the corridor method, otherwise it equals 0; the **TA_** means the logarithm of total assets which has been winsorized at 1%, and its currency is million Euros; the **LEV** means the leverage which is calculated as the total debts divided by total assets, which has been winsorized at 1%; the **ROE** means the return of shareholders' earnings and it has been winsorized at 1%; **Chemical** examines whether the firm is in the field of Chemistry; **Other service** examines whether the firm is in the field of other service; the **Machinery**

examines whether the firm is in the field of Machinery; **Other_Psector** examines whether the firm is in the field of Other industries in Primary and Secondary sectors; **Other_Tertiary sectors** examines whether the firm is in the field of Other industries in Tertiary sectors.

Table 48 presents the robustness check for determinants of early adopters of the IAS 19R. It uses the logarithm of number of employees to replace the logarithm of total assets, and employs PLEV to replace leverage. Moreover, the ROE has been replaced by ROEN. The results continue to support Hypothesis 12 and suggest that corridor method users are less likely to early adopt the IAS 19R.

Moreover, firms that have compliance disclosures regarding the corridor method are more likely to early adopt the IAS 19R, while big firms and firms with lower leverage are less likely to be early adopters. In addition, firms from France and Italy have more early adopters than firms from Germany. However, the positive effects of ROE on early adopter are lost.

Table 48. The robustness check for determinants of early adoption of the IAS 19R

VARIABLES	m1 EA	m2 EA
CM	-0.182*** (-2.722)	-0.0806** (-2.025)
DAS	0.162 (0.757)	0.217 (0.997)
Compliance_D	0.189** (2.517)	
PLEV	-0.0563** (-2.112)	-0.0630** (-2.530)
NE_	-0.0263* (-1.717)	-0.0154 (-1.082)
ROEN	0.00008 (0.417)	0.00007 (0.379)
O. Germany	-	-
France	0.0936	0.0988

(1.430)

(1.542)

Table 48. Continued

VARIABLES	m1 EA	m2 EA
Italy	0.120* (1.806)	0.130* (1.869)
Sweden	0.0279 (0.543)	0.0225 (0.423)
O. Chemical	-	-
Other service	0.0395 (0.438)	0.0149 (0.170)
Machinery	-0.00922 (-0.129)	0.00883 (0.122)
Other_Psector	0.0147 (0.170)	0.0181 (0.198)
Other_Tertiary sectors	-0.00512 (-0.0626)	0.00423 (0.0523)
Constant	0.190* (1.656)	0.153 (1.381)
Observations	181	181
Pseudo R2	0.126	0.070

Robust z-statistics in parentheses

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

This table shows the regression results examining the robustness check for the determinants of early adopters of IAS 19R (**EA**), the EA equals 1 if the firm is an early adopter of IAS 19R, otherwise it equals 0. The column m1 includes both Compliance_D and DAS, while column m2 only includes DAS to examine the determinants of early adopting the IAS 19R. The observation includes 200 companies with 50 firms each from Sweden, Italy, Germany and France. The observation is obtained from the annual reports in the year they first adopted the IAS 19R and one year previously. The **CM** examines whether the firm is a corridor method user, it equals 1 if it is, otherwise it equals 0; the **DAS** measures the disclosure level of actuarial assumptions; the **Compliance_D** measures whether a firm has compliance disclosure regarding the corridor method, it equals 1 if a firm has compliance disclosure regarding the corridor method, otherwise it equals 0; the **NE_** means the logarithm of number of employees; the **PLEV** means the proxy of leverage which has been winsorized at 1%; the **ROE** means the return of shareholders' earnings

and it has been winsorized at 1%; the **ROEN** means the ROE using net income which has been winsorized at 1%; **Chemical** examines whether the firm is in the field of Chemistry; **Other service** examines whether the firm is in the field of other service; the **Machinery** examines whether the firm is in the field of Machinery; **Other_Psector** examines whether the firm is in the field of Other industries in Primary and Secondary sectors; **Other_Tertiary sectors** examines whether the firm is in the field of Other industries in Tertiary sectors.

6.3.3 Summary of results

This section investigates management reactions and attitudes to the adoption of IAS 19R. More specifically, the effects of the removal of corridor method on corridor method users are examined.

The results of this section support Hypothesis 9 (i.e. corridor method users do not change their discount rate after the removal of the corridor method), Hypothesis 11 (i.e. the corridor method users increases their leverage when adopting the IAS 19R) and Hypothesis 12 (i.e. corridor method users are less likely to early adopt the IAS 19R), but reject Hypothesis 10 (i.e. corridor method users do not change their dividend payments after the removal of corridor method).

In addition, the employment of the IAS 19R decreases firms' discount rate even though the lower discount rate may due to the decreased interest rate during the years after adopting the IAS 19R. Moreover, the corridor method users are found to pay smaller dividends than non-corridor method users. In addition, even though corridor method users tend to increase their leverage when adopting the IAS 19R, they do not change their leverage much after using the IAS 19R long term. Furthermore, firms which have compliance disclosure regarding the corridor method are more likely to early adopt the IAS 19R.

This section examines the economic consequences of IAS 19R via the management's reaction to the adoption of IAS 19R, thus contributing to a better understanding of the application of IAS 19R.

6.4 Summary of the empirical results

This part summarizes the results of empirical tests examining the 12 hypotheses based on the three research questions in this dissertation. Thus, this part is divided into three parts presenting the results of the three research questions, namely the

results of the examinations of DAS, the corridor method and the effects of adopting the IAS 19R.

6.4.1 The results of the examinations of DAS

The first research question focuses on DAS (i.e. the disclosure level of actuarial assumptions), and the different disclosure requirements of the actuarial assumptions are one of the most important changes from IAS 19 to IAS 19R. The IAS 19R allows firms to have significant disclosures rather than the mandatory disclosures, and further lets firms define their significant actuarial assumptions. Thus, this change is considered to be given the discretionary choices to firms in disclosing the actuarial assumptions, which leaves a question on the application of IAS 19R: Will the significant disclosures improve the DAS?

The results of this section indicate that the adoption of the IAS 19R improves DAS, which supports the 'significant' disclosure in practice. However, it is also found that the application of the IAS 19R reduces the comparability of DAS. This result does not look like good news. Nevertheless, it is only the study on the adoption year of the IAS 19R. It is believed that the adoption of new rules may reduce the comparability, especially when it is a discretionary rule (Glaum et al. 2018). Even though the different language, country, and industry fields may cause differences (Cascino and Gassen 2015; Lang et al. 2010), in the long-run, the adoption of a same high-level principle will increase the comparability (Defond et al. 2011).

Furthermore, the determinants of DAS have been examined, as well as the effects of adopting the IAS 19R on the determinants of DAS and the effects of culture on DAS. It is found that the firm size, analyst following and foreign ownership have positive and significant effects on DAS, but the measurements of firm size affect the relationship between analyst following and DAS.

Moreover, firms with more foreign ownership tend to have higher *Quanti_D* after adopting the IAS 19R, which may due to the fact that firms with more foreign ownership demand better-quality disclosures. In addition, firms from lower level individual culture tend to have higher DAS.

In order to analyze the DAS, this section builds upon the models to define the DAS, and further employs the hand-collected data from 200 firms in 2 years (i.e. the year of adopting the IAS 19R and one year previously) for it. Moreover, the DAS has been investigated in detail, as it has been divided into three parts (i.e. *Text_D*, *Quanti_D* and *Sensiti_D*), and each part has been examined. Thus, not only the effects of IAS 19R on DAS can be known, but also the effects of IAS 19R on each

part of DAS. In addition, the determinants of DAS as well as the effects of adopting the IAS 19R on DAS are examined. Furthermore, three methods are used to measure the comparability of DAS. Hence, this part is expected to introduce the DAS in an understandable way and thus present the application of IAS 19R concerning its disclosure requirements.

6.4.2 The results of the examinations of the corridor method

The second research object is the corridor method. The corridor method is one of the options given by the IAS 19 to recognize the actuarial gains and losses, which allows conditional (i.e. if the net cumulative unrecognized actuarial gains and losses were within the 'corridor': the greater of 10% of the defined benefit obligation and 10% of the fair value of any plan assets) deferred recognition of actuarial gains and losses. Moreover, it is found that managers tend to use the corridor method to adjust for the leverage and smooth the volatility (Barthelme et al. 2019). However, if the IAS 19R removes the corridor method, thus, what would happen to those corridor method users? But first of all, we must take one step back; this section studies the corridor method itself, that is what are the determinants of using the corridor method. Furthermore, this section examines the compliance disclosures about the corridor method, which can directly reflect the application of the IAS 19R.

The results of this section suggest that firms with more actuarial gains and losses tend to use the corridor method, as has been expected, because the corridor method allows deferred recognition of actuarial gains and losses. Moreover, it is found that, compared to German firms, Swedish firms are more likely to use the corridor method while French firms are less likely to be corridor method users. Thus, firms with more actuarial gains and losses as well as firms from Sweden tend to use the corridor method in this dissertation.

Concerning the compliance disclosure regarding the corridor method, the restatements are expected to be shown among corridor method users due to the removal of the corridor method under IAS 19R. Even though there are seven corridor method users that do not restate the information about the corridor method, it is a small number and they give reasonable explanations. Thus, the sample has good quality of disclosures which can lead to reliable results. It is found that big firms and firms which have higher DAS tend to restate the information about the corridor method under IAS 19R. Moreover, firms in the field of Other industries in Primary and Secondary sectors are more likely to have compliance disclosure of the corridor method than firms in the field of Chemical.

This section examines the corridor method via the determinants of using it and the compliance disclosure of it. Moreover, the research period is limited to the last year which allows the use of the corridor method (i.e. the last year under the IAS 19) and the first year after abolishing the corridor method (i.e. the year in which adopted the IAS 19R). Thus, not only the corridor method but also the application of the IAS 19R are clarified. This section also contributes to the studies of compliance disclosure.

6.4.3 The results of the effects of adopting the IAS 19R

The third research question concerns the effects of adopting the IAS 19R. More specifically, this section follows the last section and examines the corridor method users' reaction to the removal of corridor method under IAS 19R.

The results in this section suggest that the employment of the IAS 19R decreases the discount rate. Since this section examines a longer period from 2008 to 2015, the discount rate has to be affected by the interest rate. Moreover, the interest rate after adopting the IAS 19R (i.e. since 2013) is much lower than before, which may lead to a decreased discount rate.

Since the dividend payments rely on profitability, the type of firm rather than the regime has more noticeable effects on it. It is found that the non-corridor method users tend to have more dividend payments than corridor method users. Moreover, big firms are found to pay more dividends than small firms. However, the corridor method users do not change much on paying dividends after adopting the IAS 19R.

Moreover, by examining the restated leverage under IAS 19R and the original leverage reported according to IAS 19 for the same year, it is found that corridor method users have a higher leverage under IAS 19R. A possible reason for this could be that the removal of corridor method requires corridor method users to recognize their unrecognized actuarial gains and losses, which leads to increased net defined benefit liabilities in the balance sheet and thus increases their leverage. However, when the observations are extended to 8 years (i.e. 3 years before and 3 years after the adopting of IAS 19R) rather than the adopting time of the IAS 19R, the leverage of the corridor method does not change to any great extent. Nevertheless, big firms and firms with lower profitability tend to have higher leverage.

In addition, the results claim that corridor method users and bigger firms are less likely to be early adopters of the IAS 19R. As the adoption of the IAS 19R abolishes

the corridor method, the corridor method users are affected by this regime, thus they need time to adjust for this change rather than becoming early adopters. Meanwhile, small firms and firms have compliance disclosure about corridor method are more likely to be early adopter of IAS 19R.

This section shows the economic consequences of adopting the IAS 19R and presents the application of IAS 19R.

7 CONCLUSION

This chapter reviews the entire dissertation, summarizes the findings of this study and discusses the implications of the findings. Moreover, the second section presents the limitations of this study and, based on which, the final section gives suggestions for future studies in this field.

7.1 Summary and implications of the study

This dissertation examines discretionary accounting choices using the setting of the IAS 19R. The IAS 19R is considered to be a good choice as its main changes include both the requirement of using a discretionary accounting choice (i.e. the disclosure requirement of actuarial assumptions) and the abolishment of a discretionary accounting choice (i.e. the removal of the corridor method). Based on the two main changes under the IAS 19R, I further build three research questions about the DAS, the removal of the corridor method and the effects of adopting the IAS 19R.

The first research question focuses on the disclosure level of actuarial assumptions (DAS), the DAS is defined according to the IAS 19R (para. 76) and IAS 19 para. 73), and each actuarial assumption has been assessed by its level of textual disclosure, quantitative disclosure and sensitivity disclosure. The three items have also been analyzed in detail. Furthermore, the information related to DAS has been hand-collected in the year firms first used the IAS 19R and one year previously (i.e. under IAS 19).

Although the results of this dissertation suggest that the adoption of the IAS 19R decreases the comparability of pension information, adopting new regimes is considered to reduce comparability (Glaum et al. 2018). Moreover, the IAS 19R is found to improve the disclosure level of pension information. Thus, the disclosure requirements (i.e. discretionary disclosure requirements) under IAS 19R is supported by this dissertation.

Moreover, even though there are many items under the disclosure of pension information, the disclosure level of each item for one firm may be consistent. It is found that firms with higher DAS are more likely to have compliance disclosure regarding the corridor method (i.e. the retrospectively restatement of information about corridor method when the corridor method is abolished and the IAS 19R is put into use).

The results of first research question have the following implications: First, to standard-setters, the application of IAS 19R improves the disclosure level of pension information. Hence, the discretionary accounting choices on disclosures may have positive effects on disclosure level. However, the disclosure level could be affected by many factors (e.g. management incentives, political influences, culture effects).

Second, investors and debtors are suggested to have some background research on firms' analyst following, foreign ownership, firm size and culture effects before making their decisions. The analyst following, foreign ownership as well as firm size have significant and positive effects on the disclosure level of actuarial assumptions (DAS). Furthermore, firms from lower-level individual cultures are more likely to have higher DAS.

The second research question pays attention to the corridor method. The corridor method is an option to recognize the actuarial gains and losses, which can be used to smooth the volatility (IFRS: para. BC193, 2013). It is found that firms with more actuarial gains and losses (the difference between actuarial gains and actuarial losses) tend to use the corridor method. Since actuarial gains and losses are required to be immediately recognized in other comprehensive income or profit or loss with other methods under IAS 19, the use of corridor method is considered to "manage" earnings.

The compliance disclosure regarding the corridor method has also been examined. Specially, the compliance disclosure in relation to the corridor method is for the data in the year before the adoption of the IAS 19R but reported in compliance with the IAS 19R. Thus, the investigation of compliance disclosure of corridor method clearly shows the effects of adopting the IAS 19R on firms. The examination of compliance disclosures regarding the corridor method shows that all firms in the sample generally have a good quality of disclosure. Most corridor method users have restated the information regarding the corridor method after adopting the IAS 19R, while seven corridor method users did not have the restatement but issued reasonable explanations. Concerning the non-corridor method users, they did not use the corridor method, hence they do not need to restate any information.

The implication of second research questions is that firms may use the discretionary accounting choices to manage earnings, especially income-increasing accounting method. Hence, investors and debtors should be more cautious on investing firms that choose to use an income-increasing/discretionary methods like corridor method.

The third research question concerns the effects of adopting the IAS 19R, which is primarily focused on the economic consequences of using the IAS 19R on corridor method users. Since the corridor method is abolished under IAS 19R, the corridor method users are expected to be affected more by the adoption of IAS 19R than non-corridor method users.

The results of this dissertation reveal that the corridor method users tend to pay smaller dividends than non-corridor method users. Moreover, the corridor method users (i.e. the corridor method can be used to decrease the pension liability) increase their leverage when adopting the IAS 19R. Furthermore, the corridor method users are less likely to be early adopters, while according to Han and Hsiao (2017) “early adopters were rewarded by the market in the year after adoption”.

The implication of the third research question is that the employment of an income-increasing measurement can not only be used to manage earnings but also affect firms’ profit when the measurement is removed. Thus, firms should think twice when choosing an income-increasing/a discretionary method in accounting.

As the IAS 19R is a pension accounting standard that was issued by the IASB in 2011 and has been put into use since 2013, it is important to obtain some knowledge about the pension accounting standards. In order to find the inner logic of the changes among pension accounting standards, I have reviewed the pension accounting standards issued by the IFRS. I find that although there are differences between the pension accounting standards, the goal of issuing the pension accounting standard is the same: to satisfy the users of financial reporting and improve the usefulness of pension information. Moreover, the IASB finds a breakthrough to improve the usefulness of the pension information: the net defined benefit liability which is recognized in the balance sheet and presented the pension situation of entities. Hence, standards of pension accounting pay more attention to the measurement and disclosure of net defined benefit liability. The IAS 19R is an example that takes both the measurement and disclosure of net defined benefit liability into account. It has different disclosure requirements of actuarial assumptions and it removes the corridor method in order to ensure immediate recognition of actuarial gains and losses.

The theoretical review of pension accounting follows the introduction of institutional background and, based on previous chapters, 12 hypotheses are developed. Furthermore, 200 firms with 50 each from France, Germany, Italy and Sweden are selected as sample of this study. Moreover, ordinary least squares,

logistic regression model, difference in difference method and tests of heteroscedasticity are used to investigate the hypotheses. Table 49 shows the 12 hypotheses and their results.

Table 49. Summary of hypotheses and results of this study

Hypothesis	Finding
H1: The adoption of the IAS 19R has no effect on the disclosure level of actuarial assumptions	There is no support for this hypothesis and the findings of this study suggest that the adoption of IAS 19R significantly increases the DAS than one year previously (i.e. under IAS 19).
H2: The adoption of the IAS 19R impedes the comparability of disclosure level of actuarial assumptions.	The findings of this study strongly support this hypothesis. It is found that the comparability of DAS is decreased in the year firms adopting the IAS 19R than one year previously (i.e. under IAS 19).
H3: There is a positive relationship between analyst following and the disclosure level of actuarial assumptions.	The findings of this study partly suggest this hypothesis. It is found that when firm size is assessed as the logarithm of number of employees, the number of analysts is positively related to DAS. However, when firm size is assessed as the logarithm of total assets, there is no relationship between analyst following and DAS.
H4: There is a positive relationship between foreign ownership and the disclosure level of actuarial assumptions.	The findings of this study strongly support this hypothesis. It is found that foreign ownership positively affects the DAS.
H5: There is a negative relationship between pension funded status and the disclosure level of actuarial assumptions.	There is no support for this hypothesis and the findings of this study claim no relationship between pension funded status and DAS.
H6: Companies with higher leverage tend to adopt the corridor method.	There is no support for this hypothesis and the findings of this study claim no

relationship between leverage and the use of corridor method.

Table 49. Continued

Hypothesis	Finding
H7: There is a negative relationship between the ownership concentration and the adoption of the corridor method.	There is no support for this hypothesis and the findings of this study claim no relationship between ownership concentration and the use of the corridor method.
H8: There is no relationship between the ownership concentration and compliance disclosure.	The findings of this study support this hypothesis and claim no relationship between ownership concentration and the compliance disclosure of corridor method.
H9: There is no relationship between corridor method users' discount rate and the removal of the corridor method.	There is no support for this hypothesis and the findings of this study suggest that the removal of corridor method does not affect corridor method users' discount rate
H10: The corridor method users reduce their dividends payments after the application of IAS 19R.	There is no support for this hypothesis and the findings of this study suggest corridor method users do not change much on their dividend payments after the application of IAS 19R.
H11: The corridor method users tend to increase their leverage as a response of adopting the IAS 19R.	The findings of this study support this hypothesis and claim that corridor method users increase their leverage when adopting the IAS 19R, but the corridor method users does not change much on their leverage in long run.
H12: Corridor method users are less likely to early adopt the IAS 19R.	The findings of this study strongly support this hypothesis. It is found that most early adopters of IAS 19R are non-corridor method users.

7.2 Limitations

This study examines the discretionary accounting choices under the IAS 19R; the two discretionary accounting choices include both disclosure requirements and recognition methods. More specifically, the two discretionary accounting choices are two of the three main changes from IAS 19 to IAS 19R. Thus, in order to examine the two changes, the research time has been strictly limited to the year of firms adopting the IAS 19R and one year previously when they were under the IAS 19. Even though the strict control of research time shows the effects of adopting the IAS 19R, the effects of using IAS 19R in the long term remain a question. For example, the results of this study suggest that the adopting of IAS 19R reduces the comparability of DAS. Although the reduced comparability is expected to be caused by the first-time use of IAS 19R, only studies on the comparability of DAS after adopting the IAS 19R could provide an answer to this expectation.

Secondly, this study has unique data of DAS, which have been obtained by hand-collecting pension information from 200 European firms. Moreover, the measurement of DAS is based on the careful comparison between IAS 19 and IAS 19R. Moreover, each actuarial assumption has been assessed by its textual disclosure, quantitative disclosure and sensitivity disclosure. Thus, the data of DAS in this study are unique and the careful hand-collecting ensures the reliable findings. However, the findings of DAS can only be related to pension accounting disclosures but not disclosures of other topics.

Finally, as stated in chapter 2, there are several important changes under the IAS 19R, therefore this dissertation focuses on the discretionary accounting choices and thus only examines two changes (i.e. the disclosure requirements for actuarial assumptions and the removal of corridor method). Consequently, future research could also study the other changes under IAS 19R: for example, the net interest approach.

7.3 Suggestions for future research

As stated earlier, this study primarily focuses on two discretionary accounting choices under IAS 19R: the DAS, and the removal of corridor method. Both of these could be extended in future research.

Concerning the DAS, this study compares the DAS in the year firms adopted the IAS 19R with one year previously (i.e. under IAS 19) to see the effects of adopting the IAS 19R on the disclosure level of pension information. Further research can extend this study by investigating the trend of DAS after adopting the IAS 19R. For

example, 3-year data for DAS after adopting the IAS 19R can be included. A further study could also compare the DAS in the year firms adopting the IAS 19R with the DAS in later years to see whether the year in which accounting method changes affects the DAS.

This study includes 200 listed European firms as the sample, as they follow the IFRS and they have similar underlying structures compared to firms from Asia or other regions. However, future studies could also include listed firms that follow the US GAAP, since the Financial Accounting Standards Board (i.e. an authority accounting standards board by the Securities and Exchange Commission and the American Institute of Certified Public Accountants) also previously allowed the corridor method . Thus, the inclusion of firms under US GAAP can investigate the differences between the two pension accounting standards in application by comparing the corridor method users under US GAAP with the corridor method users under IFRS.

References

- Aboody, D. and Kasznik, R. (2000). CEO stock option awards and the timing of voluntary disclosures. *Journal of Accounting and Economics* 29, 73–100.
- Ahmed, A. S., Kilic, E. and Lobo, G. J. (2006). Does Recognition versus Disclosure Matter? Evidence from Value-Relevance of Banks' Recognized and Disclosed Derivative Financial Instruments. *The Accounting Review* 81: 3, 567-588.
- Ahmed, K. and Courtis, J. K. (1999). Associations between corporate characteristics and disclosure levels in annual reports: A meta-analysis. *The British Accounting Review* 31: 1, 35–61.
- Akhtaruddin, M. (2005). Corporate mandatory disclosure practices in Bangladesh. *The International Journal of Accounting* 40, 399–422.
- Ali, J. M., Ahmed, K. and Henry, D. (2004). Disclosure compliance with national accounting standards by listed companies in South Asia. *Accounting and Business Research*, 34: 3, 183–199.
- Amir, E. and Gordon, E.A. (1996). Firms' choice of estimation parameters: empirical evidence from SFAS No. 106. *Journal of Accounting, Auditing and Finance* 11, 427–448.
- Amir, E. and Ziv, A. (1997). Economic consequences of alternative adoption rules for new accounting standards. *Contemporary Accounting Research* 14: 3, 543-568.
- Anantharaman, D. and Chuk, E. (2018). The economic consequences of accounting standards: evidence from risk-taking in pension plans. *The Accounting Review* 93: 4, 23-51.
- Artiach, T. C. and Clarkson, P. M. (2011). Disclosure, conservatism and the cost of equity capital: a review of the foundation literature. *Accounting & Finance* 51, 2-49.
- Astami, E. W. and Tower, G. (2006). Accounting-policy choice and firm characteristics in the Asia Pacific region: An international empirical test of costly contracting theory. *The International Journal of Accounting* 41: 1, 1–21.
- Ball, R., Kothari, S.P. and Robin, A. (2000). The effect of international institutional factors on properties of accounting earnings. *Journal of accounting and economics*, 29: 1, 1–51.
- Ball, R. (2006). International Financial Accounting Standards (IFRS): Pros and cons for investors. *Accounting and Business Research: Special Issue*, 5–27.
- Barr, N. (2009). International trends in pension provision. *Accounting and Business Research* 39: 3, 211–225.

- Barth, M. E. , Beaver, W. H. and Landsman, W. R. (1992). The market valuation implications of net periodic pension cost components. *Journal of Accounting and Economics* 15: 1, 27-62.
- Barth, M. E., Beaver, W. H. and Landsman, W. R. (1993). A structural analysis of pension disclosures under SFAS 87 and their relation to share prices. *Financial Analysts Journal* 49: 1, 18-26.
- Barth, M.E., Beaver, W.H. and Landsman, W.R. (2001). The relevance of the value relevance literature for financial accounting standard setting: another view. *Journal of Accounting and Economics* 31: 1-3, 77-104.
- Basu, R. and Naughton, J. P. (2016). Do Changes in Accounting Standards affect Corporate Credit Ratings? http://www.utah-wac.org/2016/Papers/naughton_UWAC.pdf
- Barthelme, C., Kiosse, P. V. and Sellhorn, T. (2019). The Impact of Accounting Standards on Pension Investment Decisions. *European Accounting Review* 28:1, 1-33.
- Bauman, M. P. and Shaw, K. W. (2014). An analysis of critical accounting estimate disclosures of pension assumptions. *Accounting Horizons* 28: 4, 819-845.
- Beaver, W.H. (2002). Perspectives on recent capital market research. *Accounting Review* 77: 2, 454-474.
- Beyer, A., Cohen, D. A., Lys, T. Z. and Walther, B. R. (2010). The financial reporting environment: review of the recent literature. *Social Science Electronic Publishing* 50: 2-3, 296-343.
- Bhushan, R. (1989). Firm characteristics and analyst following. *Journal of Accounting and Economics* 11: 1, 255 - 274.
- Bokpin, G. and Isshaq, Z. (2009). Corporate governance, disclosure and foreign share ownership on the Ghana stock exchange. *Managerial Auditing Journal* 24: 6, 688-703.
- Botosan, C. A. (1997). Disclosure level and the cost of equity capital. *Accounting review* 72: 3, 323-349.
- Botosan, C. A. and Harris, M. (2000). Motivations for changes in disclosure frequency and its consequences: An examination of voluntary quarterly segment disclosures. *Journal of Accounting Research* 38, 329-354.
- Botosan, C. A. and Plumlee, M. (2002). A re-examination of disclosure level and expected cost of equity capital. *Journal of accounting research* 40: 1, 21-41.
- Bova, F. and Pereira, R. (2012). The determinants and consequences of heterogeneous IFRS compliance levels following mandatory IFRS adoption: evidence from a developing country. *Social Science Electronic Publishing* 11: 1, 83-111.

- Bryant-Kutcher, L., Eiler, L. and Guenther, D. A. (2008). Taxes and financial assets: valuing permanently reinvested foreign earnings. *National Tax Journal* LXI: 4, 699-720.
- Bujaki, M. L. and McConomy, B. J. (2007). Income tax accounting policy choice: exposure draft responses and the early adoption decision by Canadian companies. *Accounting Perspectives* 6: 1, 21-53.
- Bushman, R.M., Piotroski, J. and Smith, A.J. (2004). What determines corporate transparency. *Journal of accounting research* 42: 2, 207-252.
- Buzby, S.L. (1975). Company Size, Listed Versus Unlisted Stocks, and the Extent of Financial Disclosure. *Journal of Accounting Research* 13: 1, 16-37.
- Byrne, A., Clacher, I., Hillier, D. and Hodgson, A. (2013). Assuming the worst: the shifting sands of pension accounting. *Journal of Accounting & Management Information Systems* 12: 2, 190-212.
- Cardinale, M. (2007). Corporate pension funding and credit spreads. *Financial Analysts Journal* 63: 5, 82-101.
- Carlson, S. J. and Bathala, C. T. (1997). Ownership differences and firms' income smoothing behavior. *Journal of Business Finance & Accounting* 24: 2, 179-196.
- Carroll, T. J. and Niehaus, G. (1998). Pension plan funding and corporate debt ratings. *The Journal of Risk and Insurance* 65: 3, 427-441.
- Cascino, S. and J. Gassen. (2015). What drives the comparability effect of mandatory IFRS adoption. *Review of Accounting Studies* 20: 1, 242-282
- Cassar, G. and Holmes, S. (2003). Capital structure and financing of SMEs : Australian evidence. *Accounting and Finance* 43: 2, 123-147.
- Cerf, A.R. (1961). *Corporate Reporting and Investment Decisions*, University of California, Berkley.
- Chang, M., Hooi, L. and Wee, M. (2014). How does investor relation disclosure affect analysts' forecasts, *Accounting and Finance* 54, 365-391.
- Chircop, J. and Kiosse, P. V. (2015). Why did preparers lobby to the IASB's pension accounting proposals? *Accounting Forum* 39: 4, 268-280.
- Chuk, E. (2013). Economic consequences of mandated accounting disclosures: Evidence from pension accounting standards. *The Accounting Review* 88: 2, 395-427.
- Clarkson, P. M., Van Bueren, A. L. and Walker, J. (2006). Chief Executive Officer Remuneration Disclosure Quality: Corporate Responses to an Evolving Disclosure Environment. *Accounting and Finance* 46: 5, 771-79.
- Comprix, J. and Muller, K. A. (2011). Pension plan accounting estimates and the freezing of defined benefit pension plans. *Journal of Accounting and Economics* 51: 1, 115-133.

Cooke, T. E. (1989). Disclosure in the corporate annual reports of Swedish companies. *Accounting and Business Research* 19: 74, 113–124.

Craswell, A. and S. Taylor (1992). Discretionary Disclosure of Reserves by Oil and Gas Companies: An Economic Analysis. *Journal of Business Finance and Accounting* 19: 2, 14.

Davis-Friday, P. Y., Folami, L. B., Liu, C. and Mittelstaedt, H. F. (1999). The Value Relevance of Financial Statement Recognition vs. Disclosure: Evidence from SFAS No. 106. *The Accounting Review* 74: 4, 403–423.

Davis-Friday, P., Liu, C. and Mittelstaedt, H. (2004). Recognition and disclosure reliability: Evidence from SFAS No. 106. *Contemporary Accounting Research* 21: 1, 399–429.

Deangelo, H., Deangelo, L. and Stulz, R. M. (2006). Dividend policy and the earned/contributed capital mix: a test of the life-cycle theory. *Journal of Financial Economics* 81: 2, 227–254.

Dechow, P., Hutton, A. and Sloan, R. (1996). Economic Consequences Of Accounting for Stock-based Compensation. *Journal of Accounting Research* 34, 1–20.

Dechow, P.M., Sloan, R.G. and Sweeney, A.P. (1996). Causes and consequences of earnings manipulation: an analysis of firms subject to enforcement actions by the SEC. *Contemporary accounting research* 13: 1, 1–36.

DeFond, M.L. and Jiambalvo, J. (1991). Incidence and circumstances of accounting errors. *Accounting review* 66: 3, 643–655.

DeFond, M., Hu, X., Hung, X. and Li, S. (2011). The impact of mandatory IFRS adoption on foreign mutual fund ownership: The role of comparability. *Journal of Accounting and Economics* 51: 3, 240–58.

Dempsey, S. J., Hunt, H. G. and Schroeder, N. W. (1993). Earnings management and corporate ownership structure: An examination of extraordinary item reporting. *Journal of Business Finance & Accounting* 20: 4, 479–500.

Deloitte (2012) *IAS 19- Employee benefits: A closer look at the amendments made by IAS 19R and their impacts in Switzerland*. 1st edition, Deloitte limited.

Dhaliwal, D. S. (1980). The effect of the firm's capital structure on the choice of accounting methods. *Accounting Review* 55: January, 78–85.

Dhaliwal, D. S. (1986). Measurement of financial leverage in the presence of unfunded pension obligations. *The Accounting Review* 61: 4, 651–661.

Dhaliwal, D. S., Li, O. Z., Tsang, A. and Yang, G. Y. (2011). Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. *The Accounting Review* 86: 1, 59–100.

- Dhaliwal, D. S., Salamon, G. L. and Smith, E. D. (1982). The effect of owner versus management control on the choice of accounting methods. *Journal of Accounting and Economics* 4, 41-53.
- Dhouibi, R. and Mamoghli, C. (2013). Determinants of voluntary disclosures in Tunisian bank's reports. *Research Journal of Finance and Accounting* 4: 5, 80-94.
- Di Maggio, P.J. and Powell, W. (1983). The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. *American sociological review* 48: 2, 147-160.
- Ding, Y., Jeanjean, T. and Stolowy, H. (2005). Why do national GAAP differ from IAS? the role of culture. *The international journal of accounting* 40: 4, 325-350.
- Duke, J. and Hunt, H. (1990). An empirical examination of debt covenants, restrictions and accounting-related debt proxies. *Journal of Accounting and Economics January*, 45-63.
- Dye, R. A. (2001). An evaluation of "essays on disclosure" and the disclosure literature in accounting. *Journal of Accounting and Economics* 32, 181-235.
- Einhorn, E. (2007). Voluntary disclosure under uncertainty about the reporting objective. *Journal of Accounting and Economics* 43: 2-3, 245-274.
- Emett, S. A. and Nelson, M. W. (2017). Reporting accounting changes and their multi-period effects. *Accounting, Organizations and Society* 57, 52-72.
- Ernst & Young (2011). *Implementing the 2011 revisions to employee benefits*, 1st edition, EYGM limited.
- Fasshauer, J. D., Glaum, M. and Street, D. L. (2008). Adoption of IAS 19R by Europe's premier listed companies: Corridor approach versus full recognition Summary of an ACCA research monograph. *Journal of International Accounting, Auditing and Taxation* 17: 1, 113-122.
- Feldstein, M. and Morck, R. (1983). Pension funds and the value of equities. *Financial Analysts Journal* 38, 29-39.
- Fields, T. D. , Lys, T. Z. and Vincent, L. . (2001). Empirical research on accounting choice. *Journal of Accounting and Economics* 31: 1-3, 255-307.
- Financial Accounting Standards Board (1983). *Statement of Financial Accounting Standards No. 74*, 1st edition. Financial Accounting Standards Board.
- Financial Accounting Standards Board (1984). *Recognition and Measurement in Financial Statements of Business Enterprises: Statement of Financial Accounting Concepts No. 5*, 1st edition. Financial Accounting Standards Board.
- Financial Accounting Standards Board (1985). *Statement of Financial Accounting Standards No. 87*, 1st edition. Financial Accounting Standards Board.

Financial Accounting Standards Board (1990). *Statement of Financial Accounting Standards No. 106*, 1st edition. Financial Accounting Standards Board.

Financial Accounting Standards Board (2003). *Statement of Financial Accounting Standards No. 132(R)*, 1st edition. Financial Accounting Standards Board.

Financial Accounting Standards Board (2006). *Statement of Financial Accounting Standards No. 158*, 1st edition. Financial Accounting Standards Board.

Fried, A. N. (2012). Disclosure versus recognition: Evidence from lobbying behavior in response to SFAS No. 158. *Research in Accounting Regulation* 24, 25–32.

Fried, A. N. and Davis-Friday, P. Y. (2013). Economic consequences of mandatory GAAP changes: The case of SFAS No. 158. *Advances in Accounting, incorporating Advances in International Accounting* 29: 1, 186-194.

Gao, F., Dong, Y., Ni, C. and Fu, R. (2016). Determinants and Economic Consequences of Non-financial Disclosure Quality. *European Accounting Review* 25: 2, 287-317.

Glaum, M. (2009). Pension accounting and research: a review. *Accounting and Business Research* 39: 3, 273-311.

Glaum, M., Keller, T. and Street, D. L. (2018). Discretionary accounting choices: the case of IAS 19 pension accounting. *Accounting and Business Research* 48: 12, 139-170 .

Glaum, M., Schmidt, P., Street, D.L. and Vogel, S. (2013). Compliance with IFRS 3- and IAS 36 required disclosures across 17 European countries: company and country-level determinants. *Accounting and Business Research* 43: 3, 163-204.

Godwin, J. H., Goldberg, S. R. and Duchac, J. E. (1996). An empirical analysis of factors associated with changes in pension-plan interest-rate assumptions. *Journal of Accounting, Auditing and Finance* 11: 2, 305–323.

Gopalakrishnan, V. and Sugrue, T. F. (1992). Economic consequences of pension policy deliberations (SFAS No. 87): An empirical assessment of debt-covenant hypothesis. *Journal of Business Finance and Accounting* 19: 5, 751-775

Gray, S. (1988). Towards a theory of cultural influence on the development of accounting systems internationally. *Abacus* 24: 1, 1–15

Han, L. and Hsiao. (2017). Examination of firm performance following the early adoption of sfas 142. *International Journal of Accounting & Information Management* 25: 2, 138-176

Hann, R. N., Heflin, F. and Subramanyam, K. R. (2007). Fair-value pension accounting. *Journal of Accounting and Economics* 44: 3, 328–358.

Haniffa, R. and Cooke, T. (2002). Culture, corporate governance and disclosure in Malaysian corporations. *ABACUS: Journal of Accounting, Finance and Business Studies* 38: 3, 317-349.

- Harper, R. M., Mister, W. G. and Strawser, J. R. (1987). The impact of new pension disclosure rules on perceptions of debt. *Journal of Accounting Research* 25: 2, 327-330.
- Healy, P.M. and Palepu, K.G. (2001). Information asymmetry, corporate disclosure, and the capital markets: a review of the empirical disclosure literature. *Journal of accounting and economics* 31: 13, 405-440.
- Healy, P. and Wahlen, J. (1999). A review of the earnings management literature and its implications for standard setting. *Accounting Horizons* 13: 1, 365-383.
- Hindley, B. (1970). Separation of ownership and control in the modern corporation. *The Journal of Law and Economics* 13: 1, 185-221.
- Hofstede, G., Hofstede, G. J., Minkov, M. and Vinken, H. (2008). Values Survey Module 2008 Manual. Working paper.
- Hofstede, G. (2011). Dimensionalizing Cultures: The Hofstede Model in Context. *Online Readings in Psychology and Culture*, 2: 1.
- Holthausen, R. (1990). Accounting method choice: opportunistic behavior, efficient contracting and information perspectives. *Journal of Accounting and Economics* 12: 1-3, 207-218.
- Holthausen, R.W. and Watts, R.L. (2001). The relevance of the value-relevance literature for financial accounting standard setting. *Journal of Accounting and Economics* 31: 13, 3-75.
- Hoogervorst, H. (2016). *Performance reporting and the pitfalls of non-GAAP metrics*. Maastricht, IASB Publishing.
- Hope, O.K. (2003b). Disclosure practices, enforcement of accounting standards and analysts forecast accuracy: an international study. *Journal of accounting research* 41: 2, 235-272.
- Hope, O.K., Kang, T., Thomas, W. Yoo Y. K. (2008). Culture and auditor choice: A test of the secrecy hypothesis. *Journal of Accounting and Public Policy* 27: 5, 357-373.
- Hossain, M., Tan, L. M. and Adams, M. (1994). Voluntary disclosure in an emerging capital market: Some empirical evidence from companies listed on the Kuala Lumpur Stock Exchange, *The International Journal of Accounting*, 29, 334-351
- Hsu, A., Wu, C. and Lin, J. (2013). Factors in Managing Actuarial Assumptions for Pension Fair value: Implications for IAS 19. *Review of Pacific Basin Financial Markets and Policies* 16: 1.
- International Accounting Standards Committee (1996). *Exposure Draft E54* as issued in October 1996. 1st edition, London: International Accounting Standards Board.

International Accounting Standards Committee (1998). *International Financial Reporting Standards* as issued at 1 January 1998. 1st edition, London: International Accounting Standards Board.

International Accounting Standards Board (2005). *International Financial Reporting Standards* as issued at 1 January 2005. 1st edition, London: International Accounting Standards Board.

International Accounting Standards Board (2013). *International Financial Reporting Standards* as issued at 1 January 2013. 1st edition, London: International Accounting Standards Board.

IFRS. 2016. *Projects in the IASB's Research Programme* [Online]. [22 March 2016]. Available from World Wide Web < <http://www.ifrs.org/IFRS-Research/Research-opportunities/Pages/Projects-in-the-IASB-research-programme.aspx>>.

Inchausti, B.G. (1997). The Influence of Company Characteristics and Accounting Regulation on Information Disclosed by Spanish Firms. *The European Accounting Review* 6: 1, 45–68.

Jensen, M.C. and Meckling, W.H. (1976). Theory of the Firm: Management Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics* 3: 3, 305–360.

Jordan, J., Lowe, J. and Taylor, P. (1998). Strategy and financial management in UK small firms. *Journal of Business Finance and Accounting* 25, 1–27.

Karim, K. E. , Lacina, M. J. and Rutledge, R. W. (2006). The association between firm characteristics and the level of environmental disclosure in financial statement footnotes. *Advances in Environmental Accounting and management* 3, 77-109.

Khurana, I. K. and Loudder, M. L. (1994). The Economic Consequences of SFAS 106 in Rate-Regulated Enterprises. *The Accounting Review* 69: 2, 364-380.

Klumpes, P. J. M. (2000). Incentives and disincentives for voluntary disclosure by pension funds: international evidence. *Accounting and Business Research* 30: 4, 287-298.

KPMG (2011). *First impressions: Employee benefits*. 1st edition, KPMG limited.

Kwon, S. S. , Kim, S. and Gaber, B. (2008). Voluntary asset write-downs under sfas 121: early adopters vis-a-vis late adopters. *International Journal of Accounting and Finance* 1:1, 83-106.

Landsman, W. R. and Ohlson, J. A. (1990). Evaluation of market efficiency for supplementary accounting disclosures: The case of pension assets and liabilities. *Contemporary Accounting Research* 7: 1, 185-198.

Lanen, W.N. and Verrecchia, R.E. (1987). Operating decisions and the disclosure of management accounting information. *Journal of Accounting Research* 25, 165–189.

- Lang, M. and Lundholm, R. (1996). Corporate disclosure policy and analyst behavior. *The Accounting Review* 71: 1, 467–492.
- Lang, M., Maffett, M. and Owens, E. (2010). *Earnings co-movement and accounting comparability: The effects of mandatory IFRS adoption*. Working paper, University of North Carolina.
- Langer, R. and Lev, B. (1993). The FASB's policy of extended adoption of new standards: an examination of FAS No. 87. *The Accounting Review* 66: 3, 515-533.
- Leuz, C. and Verrecchia, R. (2000). The economic consequences of increased disclosure. *Journal of accounting research* 38: 3, 91-124.
- Leuz, C. and Wysocki, P.D. (2008). Economic consequences of financial reporting and disclosure regulation: a review and suggestions for future research [online]. Available from World Wide Web: <<http://ssrn.com/abstract=1105398>>
- Li, Y. and McConomy, B. J. (1999). An empirical examination of factors affecting the timing of environmental accounting standard adoption and the impact on corporate valuation. *Journal of Accounting, Auditing & Finance* 14: 3, 279-313.
- Libby, R., Nelson, M. W. and Hunton, J. E. (2006). Recognition v. Disclosure, Auditor Tolerance for Misstatement, and the Reliability of Stock-Based Compensation and Lease Information. *Journal of Accounting Research* 44: 1, 533–60.
- Lode, N. A. and Napier, C. J. (2014). Recognition of actuarial gains and losses under IAS 19 among UK listed companies. *Journal Pengurusan* 40, 15-24.
- Lode, N. A. and Yusof, M. A. M. (2015). Pension accounting disclosures and stock market reactions. *Journal of Developing Areas* 49: 3, 407-416.
- Mangena, M. and Tauringana, V. (2007). Disclosure, corporate governance and foreign share ownership on the Zimbabwe stock exchange. *Journal of International Financial Management and Accounting* 18: 2, 53-85.
- McNally, G.M., Eng, L.H. and Hasseldine, C.R. (1982). 'Corporate Financial Reporting in New Zealand: An Analysis of User Preference, Corporate Characteristics and Disclosure Practices for Discretionary Information', *Accounting and Business Research*, 13, Winter, 11–20.
- Miller, G. S. and Skinner, D. J. (2015). The Evolving Disclosure Landscape: How Changes in Technology, the Media, and Capital Markets Are Affecting Disclosure. *Journal of Accounting Research*, 53: 2, 221-239.
- Mitra, S. and Hossain, M. (2009). Value-relevance of pension transition adjustments and other comprehensive income components in the adoption year of SFAS No. 158. *Review of Quantitative Finance and Accounting* 33, 279–301.
- Morais, A. I. (2008). Actuarial gains and losses: the choice of the accounting method. *Accounting in Europe* 5: 2, 127-139.

- Morais, A. I. (2010). Actuarial gains and losses: the determinants of the accounting method. *Pacific Accounting Review* 22: 1, 42-56.
- Norton, C. (1988). Pension Accounting: Effects of Early Adoption. *CPA Journal*, 46-51.
- Olivieri, G. and Fersini, P. (2014). The interest cost calculation under IAS 19 when discounting with a yield curve. *International Journal of Accounting and Financial Reporting* 4: 2, 171-185
- Oxelheim, L. and Randoy, T. (2003). The impact of foreign board membership on firm value. *Journal of Banking and Finance* 27: 12, 2369-2392.
- Pae, S. (2002). Discretionary disclosure, efficiency, and signal informativeness. *Journal of Accounting and Economics* 33: 3, 279-311.
- Picconi, M. (2006). The Perils of Pensions: Does Pension Accounting Lead Investors and Analysts Astray. *Accounting Review* 81: 4, 925-55.
- Press, E. and Weintrop, J. (1990). Accounting-based constraints in public and private debt agreements: their association with leverage and impact on accounting choice. *Journal of Accounting and Economics* 12: January, 65-95.
- PwC (2013). *Practical guide to IFRS: IAS 19(revised) significantly affects the reporting of employee benefits*. 1st edition, PwC limited.
- Salter, S.B. and Niswander, F. (1995). Cultural influence on the development of accounting systems internationally: a test of Gray's [1988] theory. *Journal of international business studies* 26: 2, 379-397.
- Sami, H. and M. Walsh (1992). Characteristics of Early and Late Adopters of Pension Accounting Standard SFAS No. 87. *Contemporary Accounting Research* 9 :1, 212-235.
- Sasaki, T. (2017). Pension accrual management and research and development investment. *Accounting & Finance* 57:4, 1127-1147.
- Schipper, K. (2003). Principles-based accounting standards. (Commentary). *Accounting Horizons*, 17: 1, 61-72.
- Scott, T. W. (1991). Pension Disclosures Under SFAS No.87: Theory and Evidence. *Contemporary Accounting Research* 8: 1, 62-81.
- Scott, T. W. (1994). Incentives and disincentives for financial disclosure: Voluntary disclosure of defined benefit pension plan information by Canadian firms. *The Accounting Review* 69: 1, 26-43.
- Singhvi SS (1968). Characteristics and implications of inadequate disclosure: A case study of India. *International Journal of Accounting* 3: 2, 29-43.
- Skinner, D. J. (1993). The investment opportunity set and accounting procedure choice : preliminary evidence. *Journal of Accounting & Economics* 16: 4, 407-445.

- Smith, J. A. and Rezaee, Z. (1995). Earnings management by the early adopters of SFAS no. 106. *International Advances in Economic Research* 1: 4, 426-430.
- Stadler, C. (2010). Pension accounting choice in germany: pension discount rate and actuarial gains and losses. *Ssrn Electronic Journal*.
- Street, D.L. and Bryant, S.M. (2000). Disclosure level and compliance with IASs: a comparison of companies with and without U.S. listings and filings. *International journal of accounting* 35: 3, 305–329.
- Suijs, J. (2007). Voluntary disclosure of information when firms are uncertain of investor response. *Journal of Accounting and Economics* 43, 391-410.
- Sunder, S. (2009). IFRS and Accounting Consensus. *Accounting Horizons* 23: 1, 101-111.
- Tsalavoutas, I. (2011). Transition to IFRS and compliance with mandatory disclosures: what is the signal. *Advances in Accounting* 27: 2, 390-405.
- Vergauwe, S. and Gaeremynck, A. (2018). Do measurement-related fair value disclosures affect information asymmetry? *Accounting and Business Research*, 1-27.
- Verrecchia, R. E. (1983). Discretionary disclosure. *Journal of Accounting and Economics* 5: 12, 179- 194.
- Wallace, R.S.O., Naser, K. and Mora, A. (1994). The Relationship Between Comprehensiveness of Corporate Annual Reports and Firm Characteristics in Spain. *Accounting and Business Research* 25: 97, 41–53.
- Watson Wyatt Worldwide (2006). How will FASB's accounting changes affect shareholders' equity and credit ratings? [Accessed December 2006] Available from World Wide Web: <www.watsonwyatt.com>.
- Watts, R.L. and Zimmerman, J.L. (1978). Towards a Positive Theory of the Determination of Accounting Standards. *Accounting Review* 53: 1, 112–34.
- Watts, R. and Zimmerman, J. (1986). *Positive Accounting Theory*. Prentice Hall, Englewood Cliffs, NJ.
- Watts, R. and Zimmerman, J. (1990). Positive accounting theory: A ten Year Perspective. *The Accounting review* 65: 1, 131-156.
- Waweru, N.M., Ntui, P.P. and Mangena, M. (2011). Determinants of different accounting methods choice in Tanzania: a positive accounting theory approach. *Journal of Accounting in Emerging Economies* 1: 2, 144-159.
- Wiseman, J. (1982). An evaluation of environmental disclosures made in corporate annual reports. *Accounting Organizations & Society* 7: 1, 53-63.
- Wu, W., Thibodeau, N. and Couch, R. B. (2016). An option for lemons? the fair value option for liabilities during the financial crisis. *Social Science Electronic Publishing* 31: 4.

Xiao, H. and Yuan, J. (2007). Ownership structure, board composition and corporate voluntary disclosure: evidence from listed firms in China. *Managerial Auditing Journal* 22: 6, 604-619.

Yip, R. W. Y. and Young, D. (2012). Does mandatory ifrs adoption improve information comparability? *Accounting Review* 87: 5, 1767-1789.

Yu, K. (2013). Does recognition versus disclosure affect value relevance? Evidence from pension accounting. *The Accounting Review* 88: 3, 1095–1127.

Yu, K. (2014). The market reaction to the pronouncements related to international accounting standards (ias) 19R. *Journal of Modern Accounting and Auditing* 10: 7, 727-746.

Appendix

Variable definitions

Variables for disclosure quality

DISC_RATE	The disclosure of discount rate
SALARY_FUTURE	The disclosure of future salary
MEDICAL_COST	The disclosure of medical cost for employees
BENEFIT	The disclosure of benefit level
MORTALITY	The disclosure of mortality
DEP	the disclosure of dependents' benefit
EMP_TURNOVER	The disclosure of employee turnover
DISABILITY_RATIO	The disclosure of disabled employees' benefit
EARLY_RETIRE	The disclosure of early retirement

Dependent variables for H1-H12

DAS	The disclosure level of actuarial assumptions
Text_D	The textual description of actuarial assumptions
Quanti_D	The quantitative of actuarial assumptions
Sensiti_D	The sensitivity analysis of actuarial assumptions
Δ DAS	The comparability of DAS, which is the difference between a firm's DAS and the average of all firms' DAS.
Δ Text_D	The comparability of Text_D, which is the difference between a firm's Text_D and the average of all firms' Text_D.
Δ Quanti_D	The comparability of Quanti_D, which is the difference between a firm's Quanti_D and the average of all firms' Quanti_D

Δ Sensiti_D	The comparability of Sensiti_D, which is the difference between a firm's Sensiti_D and the average of all firms' Sensiti_D
CM	The corridor method users, which equals 1 if the firm is a corridor method user, otherwise it equals 0
Compliance_D	The compliance disclosure regarding the corridor method, which equals 1 if a firm has compliance disclosure regarding the corridor method, otherwise it equals 0
AF	The analyst following
FO	The foreign ownership
DR	The discount rate
DP_R	Stands for dividend payables, which is equal to a firm's dividend payments divided by its revenue
LEV	Leverage, which is measured as the total debts divided by total assets (i.e. $Lev=TD/TA$)
LEV_19_CM	Stands for the corridor method users' leverage under IAS 19
LEV_restated_CM	This means the corridor method users' leverage for the year before adopting the IAS 19R that has been restated according to the IAS 19R.
EA	The early adoption, which equals 1 if a firm adopt the IAS 19R early than the fiscal year 2013, and it equals 0 otherwise.
<hr/>	
Test variables for H1 to H12 (if included before will not be shown again)	
<hr/>	
IAS 19R	Whether adopting the IAS 19R, it equals 1 if the disclosure is under IAS 19R, otherwise it equals 0.

PFS	The funded status, which is equal to the plan asset divided by the defined benefit obligation (i.e. $FS=PA/DBO$)
OC	The ownership concentration, which is obtained from Datastream (i.e. a database), and it is equal to the proportion of shares owned by the largest owner. The ownership concentration of an entity is measured at the bigger of: a) the largest ownership of the entity to its direct ownership; and b) the largest ownership of the entity to its total ownership.
CMIAS 19R	The interaction between CM and IAS 19R, which measures the influences of corridor method users after adopting the IAS 19R

Control variables for H1 to H12 (if included before will not be shown again)

Corridor	The corridor method, which equals 1 if the firm adopted the corridor method, it equals 0 if it is not.
L_AF	The logarithm of the number of analyst following, these data are obtained from Datastream (i.e. a database)
AGL_R	Measures the actuarial gains and losses, which is calculated as the difference between actuarial gains and actuarial losses divided by total assets (i.e. $(\text{actuarial gains}-\text{actuarial losses})/\text{total assets}$).
OR_A	Measures the operating revenue, which is calculated as the firm's operating revenue divided by the firm's total assets
PM	The profit margin, which is obtained from Orbis
TA_	The logarithm of total assets, which can be used to assess the firm size
NE	The number of employees, this is obtained from Datastream

NE_	The logarithm of number of employees, which is used as the proxy of TA_ to assess the firm size.
ROE	Rate of Return on Common Stockholders' Equity, more specifically, it is ROE using P/L before tax, which is obtained from Orbis (i.e. a database).
ROEN	Rate of return on common stockholders' equity; more specifically, it is ROE using net income, which is calculated as the net income divided by equity (i.e. ROEN=net income/ equity)
PLEV	The proxy of leverage, which is measured as the liabilities divided by equity (i.e. PLEV = Liabilities/Equity)
E_R	Measures the equity of firms, which is calculated as the firm's equity divided by the firm's total assets.
Growth	The firm's growth in sales
Large	The large ownership, it equals 1 if an entity's ownership concentration is more than average of all entities' ownership concentration, it equals 0 if otherwise.
Country	the influences of different countries (i.e. Germany, France, Italy, Sweden)
Secrecy	It measures the culture effects, which is calculated as the scores of Uncertainty Avoidance (UA) plus scores of Power Distance (PD) less scores of individuals (IND).
UA	The uncertainty avoidance, which is one of the culture factors based on Hofstede's dimension and its value is obtained from Hofstede et al. (2008) and http://geert-hofstede.com/ (retrieved May 2013).
PD	The power distance, which is one of the culture factors based on Hofstede's dimension and its value is obtained from Hofstede et al. (2008) and http://geert-hofstede.com/ (retrieved May 2013).

IND	The individuals, which is one of the culture factors based on Hofstede's dimension and its value is obtained from Hofstede et al. (2008) and http://geert-hofstede.com/ (retrieved May 2013).
Industry	It examines whether different industries influence the comparability of DAS, and there are 13 industry fields among the sample; these are: Construction, Education, Food, Gas, Hotel, Metals, Post, Primary Sector, Publishing, Textiles, Transportation, Wholesale and Wood. The 13 industry fields have been re-classified in chapter 5.2.1 to become: Machinery, Chemistry, Other service, Other industries in the field of Primary and Secondary sectors and Other industries in the field of Tertiary sector.

The measurement of all items of actuarial assumptions are collected from the annual reports in the year IAS 19R applied or one year previously, the data of foreign ownership, ownership concentration, pension funded status, large ownership, dividend payables, operating revenue, leverage, ROE, ROEN, audit opinions, analyst following, accounting background board members and number of employees are obtained from Orbis.