

The impact of IFRS on private debt covenants: international evidence

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The Impact of IFRS on Private Debt Covenants: International Evidence



Jingduan Li

November 2018

A thesis submitted in fulfilment of the requirements for
the degree of Master of Philosophy, UNSW Business School, UNSW Sydney

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Abstract My thesis examines the changes to debt covenants associated with the mandatory adoption of International Financial Reporting Standards (IFRS). I first examine the change in the use of accounting covenants after the mandatory adoption of IFRS. Then I investigate whether other factors such as the differences between local Generally Accepted Accounting Principles (GAAP) and IFRS, and cross-country enforcement differences, can also affect the use of accounting debt covenants. I also examine the use of non-accounting covenants after the mandatory IFRS adoption. The sample I use is new private debt issues between 2001 and 2010 in 18 IFRS-adopting countries (treatment group) and in 16 non-IFRS countries (control group), consisting of 290 and 1,199 firm-year observations for IFRS and non-IFRS countries, respectively. Employing a difference-in-difference specification that controls for firm and debt issue characteristics, I find a significant decline in the use of accounting-based debt covenants in IFRS-adopting countries after IFRS adoption, but not in non-IFRS adopting countries. This reduction is more pronounced in countries with a high level of difference between IFRS and prior local GAAP. In addition, I find that among these high difference countries, the significant decrease only exists in strong enforcement countries. I also find that the use of non-accounting covenants increases after IFRS adoption. My results are robust with respect to a variety of tests. Collectively, the results suggest that the mandatory adoption of IFRS increases the uncertainty and volatility of accounting numbers in debt contracts, and thereby reduces debt contractibility. How extensively local GAAP and IFRS differ is the main reason for the uncertainty that is injected into accounting numbers in debt covenants. In addition, the results suggest that only in those countries with strong enforcement do the effects of IFRS in fact occur. Increased non-accounting covenants use suggests that lenders rely on other kinds of covenants to protect themselves when accounting covenants become less useful. Therefore, the observed reduction in accounting-based debt covenants is not due to increased transparency inherent in IFRS. The results suggest that financial statements prepared under IFRS have potential limitations for debt contracting. Keywords: debt covenants; IFRS; contractibility; fair value accounting		

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ABSTRACT

My thesis examines the changes to debt covenants associated with the mandatory adoption of International Financial Reporting Standards (IFRS). I first examine the change in the use of accounting covenants after the mandatory adoption of IFRS. Then I investigate whether other factors such as the differences between local Generally Accepted Accounting Principles (GAAP) and IFRS, and cross-country enforcement differences, can also affect the use of accounting debt covenants. I also examine the use of non-accounting covenants after the mandatory IFRS adoption.

The sample I use is new private debt issues between 2001 and 2010 in 18 IFRS-adopting countries (treatment group) and in 16 non-IFRS countries (control group), consisting of 290 and 1,199 firm-year observations for IFRS and non-IFRS countries, respectively.

Employing a difference-in-difference specification that controls for firm and debt issue characteristics, I find a significant decline in the use of accounting-based debt covenants in IFRS-adopting countries after IFRS adoption, but not in non-IFRS adopting countries. This reduction is more pronounced in countries with a high level of difference between IFRS and prior local GAAP. In addition, I find that among these high difference countries, the significant decrease only exists in strong enforcement countries. I also find that the use of non-accounting covenants increases after IFRS adoption. My results are robust with respect to a variety of tests.

Collectively, the results suggest that the mandatory adoption of IFRS increases the uncertainty and volatility of accounting numbers in debt contracts, and thereby reduces debt contractibility. How extensively local GAAP and IFRS differ is the main reason for the uncertainty that is injected into accounting numbers in debt covenants. In addition, the results suggest that only in those countries with strong enforcement do the effects of IFRS in fact occur. Increased non-accounting covenants use suggests that lenders rely on other kinds of covenants to protect themselves when accounting covenants become less useful. Therefore, the observed reduction in accounting-based debt covenants is not due to increased transparency inherent in

IFRS. The results suggest that financial statements prepared under IFRS have potential limitations for debt contracting.

Keywords: debt covenants; IFRS; contractibility; fair value accounting

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LIST OF ABBREVIATIONS

DID	Difference-in-difference
Diff	Differences between IFRS and local GAAP
EU	European Union
GAAP	Generally Accepted Accounting Principles
HDSE	HighDiff with StrongEnf
HDWE	HighDiff with WeakEnf
HighDiff	High difference between IFRS and local GAAP
IAS	International Accounting Standards
IASB	International Accounting Standards Board
IFRS	International Financial Reporting Standards
LDSE	LowDiff with StrongEnf
LDWE	LowDiff with WeakEnf
LowDiff	Low difference between IFRS and local GAAP
StrongEnf	Strong enforcement
U.S.	United States
WeakEnf	Weak enforcement

CHAPTER 1 INTRODUCTION

1.1 Objectives and Motivations for the Thesis

Since 2005, tens of thousands of listed companies in many countries around the world, including the European Union (hereafter “EU”) and Australia, have adopted International Financial Reporting Standards (hereafter “IFRS”) (IFRS Foundation 2018). The motivation for the mandatory adoption of IFRS has been a requirement in place that ensures greater comparability, transparency and financial reporting quality among countries (European Community Regulation No. 1606/2002).

Several research studies have examined the effects of the use of IFRS since the mandatory adoption of IFRS 13 years ago. Most of these studies focus on equity markets and evaluate the reporting quality of financial statements. For example, Daske and Gebhardt (2006) report that disclosure quality improved after IFRS adoption in three European countries.¹ Aharony, Barniv and Falk (2010) suggest that the value relevance of three accounting numbers, specifically, goodwill, research and development cost, and asset revaluations, has increased after the adoption of IFRS in EU countries.² Yip and Young (2012) show that mandatory IFRS adoption can improve the comparability of cross-country information.³ The research

¹ Daske and Gebhardt (2006) use Germany, Switzerland and Austria and find that disclosure quality improved in these three countries after IFRS adoption.

² Aharony et al. (2010) obtain the financial statements data from 14 EU countries. The value relevance of the accounting information disclosed in the financial statements for 2005 and 2006 is compared in their paper.

³ Yip and Young (2012) collect data from 17 European countries. They employ three proxies to measure information comparability, namely, “the similarity of accounting functions that translate economic events into accounting data”, “the degree of information transfer”, and “the similarity of the information content of earnings and of the book value of equity”.

objectives of these studies are consistent with the purpose of EU Regulation 1606/2002. The results from these studies are also consistent with the widely held belief that IFRS improved the transparency and comparability of financial statements, thereby increasing their informativeness.

However, on the other hand, according to George, Li and Shivakumar (2016), accounting plays two major roles in debt markets, namely, valuation and contracting. The former enables lenders and borrowers to reduce information asymmetry, which requires accounting information to reflect managers' private and forward-looking information. The role of accounting in contracting is to provide financial reports which are capable of being audited. In turn these reports are derived from calculating financial outcome variables for the purpose of making efficient and effective commercial contracts where the accounting numbers can be independently verified and enforced in a court of law. As IFRS place greater emphasis on the use of fair value accounting, which in turn increases the uncertainty of accounting numbers, the valuation of contracts may be affected by IFRS implementation. George et al. (2016) also suggest that accounting numbers are highly relevant to debt contracts.

Hence, IFRS likely has effects on debt markets, especially on debt contracts. Nevertheless, few studies so far have evaluated these effects. Additionally, the relationship between IFRS accounting attributes and the use of IFRS numbers in debt contracts requires further research because there is a lack of comprehensive and detailed contract data available for archival research (Skinner 2011).

Some authors find that the use of accounting-based debt covenants declines after IFRS adoption, but they provide different reasons for this. Chen, Chin, Wang and Yao (2015) suggest that the increased transparency and reduced information asymmetry enables lenders to improve their trust in borrowers and thereby it reduces their reliance on accounting covenants. Conversely, Ball, Li and Shivakumar (2015) suggest that the decreased use of accounting covenants results from reduced contractibility. According to Lerner and Malmendier (2010), Christensen and Nikolaev (2012) and Ball et al. (2015), contractibility is the degree to which the matching of a project owner's (i.e. borrower's) requirements with the available contractor's (i.e. lender's) experience and knowledge facilitates the optimisation of cost, quality, and time elements of a loan contract. In short, contractibility is the quality or degree of being contractible, or the capability of being contracted. Therefore, decreased contractibility means that the degree (quality) of capability of contracting, or drawing together declines. If this happens, lenders must find other methods to protect themselves, which would reduce the efficiency of financing.

Unlike transparency and comparability, contractibility is difficult to observe precisely in archival data. However, the conceptual difference between the contractibility of information in contracting contexts and its usefulness for evaluation is critical to the analysis in this thesis. For example, from Ball et al. (2015), disclosing managers' private information regarding expected cash flows from an asset can provide information to many or even all users, but, at the same time, the fair value of an asset based on these publicly disclosed cash flow estimates may lack contractibility because of their uncertainty. Contractual outcomes based on the

disclosure of unobservable private information by one contracting party may cause a moral hazard that other contracting parties will attempt to avoid. In addition, from the viewpoint of lenders, the adoption of IFRS can provide opportunistic managers with greater discretion because these standards are perceived to be more principle-based than many previous domestic rule-based standards. Therefore, IFRS give borrowers greater choice when choosing alternative accounting policies and, moreover, IFRS also provide greater discretion to borrowers in the implementation process.

Compared with many previous domestic standards, IFRS also place more emphasis on the use of fair value accounting and some properties of fair value could reduce the suitability of financial statement information in debt contracting. Fair value gains and losses include shocks to the cash flows of assets that are temporary, making current-period earnings a poorer predictor of future solvency, especially with regard to longer-term debt (Li 2010; Christensen and Nikolaev 2012). Fair value gains and losses also include shocks to the expected returns on assets, which are expected to recover at least partially before the debt matures, reducing the efficiency of balance sheet and earnings variables in debt contracting. In addition, as the debt contracts require the repayment of principal and interest, rather than the fair value of the debt, the choice to use certain financial liabilities' fair valuation under IFRS would reduce the contracting value of IFRS.

For this thesis, I study the changes to debt contracting, particularly debt covenants, associated with the mandatory adoption of IFRS in a wide range of countries. Based on Chen et al. (2015), Ball et al. (2015) and Brown (2016), I first

examine the changes in accounting covenants use after IFRS and then I investigate the impact of differences between local Generally Accepted Accounting Principles (hereafter “GAAP”) and IFRS on accounting covenants use. In addition, I test whether country-level enforcement can also affect debt covenants use. Furthermore, I also explore some new evidence, specially, the use of non-accounting covenants, to support the view that changes in accounting covenants use results from decreased contractibility rather than increased transparency.

In this thesis, I only investigate the effects of IFRS on private debt contracts because bonds tend to have fewer covenants and bond issuances involve greater information acquisition prior to lending, which reduces information asymmetry (Ball et al. 2015). In addition, relative to private debt, public bonds have higher costs when renegotiating terms or when deciding on whether to exercise veto options in order to reach an agreement. Therefore, the effects of IFRS on debt covenants may be weaker for public bonds. Another important factor is the limited availability of data. I do not have access to public bond databases and I cannot collect public bond issuance data required due to it being unavailable at UNSW.

In Section 1.2, I discuss the primary research question of this thesis. Research design and major findings are provided in Section 1.3. Section 1.4 and 1.5 introduce the contributions and the thesis structure, respectively.

1.2 Research Question

This thesis aims to empirically examine the effects of IFRS adoption on private debt covenants. According to prior literature (Chen et al. 2015; Ball et al. 2015; Brown 2016), the adoption of IFRS is likely to affect the use of accounting debt covenants. These papers have two competing views regarding the impact of IFRS on accounting debt covenants: Chen et al. (2015) suggest that the increased transparency and reduced information asymmetry after IFRS adoption enables lenders to improve their trust in borrowers and thereby reduce their reliance on accounting covenants. On the other hand, Ball et al. (2015) suggest that IFRS would increase the uncertainty of accounting numbers and thus reduce the contractibility of debt contracting. As a result, following on from the above papers, this thesis investigates the following primary research question and examines whether accounting debt covenants use is related to IFRS adoption.⁴

Research Question: Does the mandatory adoption of IFRS affect the use of debt covenants?

These effects can be reflected in both accounting-based debt covenants and non-accounting-based debt covenants.

For accounting covenants, if a change in accounting covenants use results from IFRS adoption, this phenomenon should be more pronounced if the differences between local GAAP and IFRS are higher, due to the higher uncertainty of

⁴ Specific hypotheses and detailed descriptions regarding the research question are developed in Chapter 2.

accounting numbers and the greater convergence required. Further, for those countries with a high difference between local GAAP and IFRS, the effects of IFRS should be better reflected in strong enforcement countries than in weak enforcement countries.

On the other hand, the effects of IFRS can also affect the use of non-accounting covenants. Demerjian (2017) suggests that increased transparency should reduce the use of both accounting and non-accounting covenants. Conversely, if IFRS reduce contractibility, non-accounting covenants use should not be affected as fair value accounting only affects accounting covenants. Moreover, the use of non-accounting covenants may even increase after IFRS adoption, where non-accounting covenants are considered a substitute for accounting covenants. Detailed descriptions about non-accounting covenants use are provided in Chapter 2.

1.3 Research Design and Major Findings

I investigate the effect of IFRS adoption on debt contracting using a sample of new private debt issues between 2001 and 2010 in 18 IFRS-adopting countries as the treatment group, and 16 non-IFRS countries as the control group. When employing a difference-in-difference specification that controls for firm and debt issue characteristics, I find a significant decline in the use of accounting-based debt covenants in IFRS-adopting countries after the adoption of IFRS, but not in non-IFRS adopting countries.⁵ This result is consistent with that found in Chen et al. (2015), Ball et al. (2015) and Brown (2016).

The effect of IFRS is much more significant in countries with a high level of difference between IFRS and prior local GAAP than in a low-difference scenario because accounting standards would change to a greater extent in the high-difference countries. In addition to using the Bae Index as a measurement of differences between IFRS and local GAAP (as in Ball et al. (2015) and Brown (2016)), I use three additional measurements of these differences from Nobes (2001), Street (2002), Ding, Hope, Jeanjean and Stolowy (2007). I find that greater declines in the use of accounting covenants are observed in countries where pre-IFRS domestic accounting standards differ from IFRS to a commensurately greater extent.

Kvaal and Nobes (2010, 2012) point out that the effects of IFRS can arise only if adopting countries shift their accounting standards from local GAAP to IFRS, and

⁵ The significance in one of my research models (Probit model) disappears when excluding the U.S. observations, but all the other specifications show significant results. One possible reason is that the U.S. data is very different from the data sourced from other countries. The detailed analysis is provided in Section 5.2.

the effects would not eventuate in weak rule enforcement countries where compliance with accounting standards may be poor. Daske, Hail, Leuz and Verdi (2013) point out that companies tend to continue with some of their previous national practices after IFRS adoption.⁶ By using the Total Enforcement Index from Brown, Preiato and Tarca (2014), I find that the significant decrease in the use of accounting covenants only exists in countries with strong enforcement combined with a high level of difference between IFRS and local GAAP. Conversely, this decrease does not occur in countries with weak enforcement combined with high difference between IFRS and local GAAP, or in countries with a low difference between IFRS and local GAAP under any level of enforcement.

Furthermore, I find that the use of non-accounting covenants increases after IFRS adoption, indicating that the changing of accounting covenants use should be attributed to reduced contractibility rather than increased transparency, as Demerjian (2017) suggests that both accounting and non-accounting covenants should decrease if the main effect of IFRS is increased transparency.

⁶ According to Daske et al. (2013), after IFRS adoption, two kinds of adopters exist. “Label adopters” refer to firms which only adopt IFRS in name without making material changes to their accounting policies, whereas “serious adopters” refer to firms which make material changes to their reporting after IFRS adoption.

1.4 Contributions

This thesis examines the effects of IFRS adoption on debt covenants and provides evidence for the view that the changing use of accounting covenants results from decreased contractibility rather than increased transparency. Contributions to the accounting literature are the following:

In some papers (e.g., Ball et al. 2015; Brown et al. 2016), the authors assume that the differences between local GAAP and IFRS are static, but, in fact, this assumption is not realistic. Although the mandatory adoption of IFRS was imposed after 2005, some low enforcement countries may continue to use their pre-IFRS accounting standards, or they may otherwise fail to comply with IFRS.⁷ Therefore, I contribute to the investigation of the dynamic difference (convergence) between IFRS and local GAAP after the adoption of IFRS. More specifically, I classify countries with high difference between local GAAP and IFRS into two groups, namely, high difference countries with strong rule enforcement and high difference countries with weak rule enforcement. The former countries are more likely to experience a higher level of decline in the use of accounting covenants because the convergence to IFRS in this group is higher than in other groups.

⁷ For example, although one country has a high difference between local GAAP and IFRS before 2005, it may still keep the prior local accounting standards after IFRS adoption if this country has a weak enforcement. In this case, the difference between local GAAP and IFRS will not change a lot. However, if a country has a high difference between local GAAP and IFRS before 2005, the difference will become very small after IFRS adoption if the country has a strong enforcement. Therefore, “dynamic” means the difference between local GAAP and IFRS could change after IFRS adoption, and the countries with strong enforcement will change the difference from high to low after 2005.

This thesis also examines, and provides evidence relating to contractibility change brought about by a change in non-accounting covenants. The increased use of non-accounting covenants is consistent with the viewpoint that the reduced use of accounting covenants is not caused by increased transparency, whereas increased transparency should, in fact, decrease the use of both accounting and non-accounting covenants.

In addition, I contribute to examining the effects of IFRS adoption announcement on debt covenants. This provides a new direction for exploring the impact of IFRS adoption on debt covenants because the perception of lenders and borrowers from the announcement should be compared to that from the actual adoption of IFRS.

Furthermore, this study also makes a general contribution to the literature on the use of accounting information in debt contracting. Several studies have shown that the properties of accounting numbers affect their use. Nikolaev (2010) finds that the use of accounting covenants is related to the extent of timely loss recognition. Costello and Wittenberg-Moerman (2011) find that when internal control weaknesses impede the reliability of financial statements, the use of accounting covenants will decrease. This study is consistent with the evidence presented in the Demerjian (2011) study that increased fair value accounting in the United States (hereafter “U.S.”) has reduced the use of balance sheet-based debt covenants and this study is also consistent with the findings in Chen et al. (2015) and Ball et al. (2015).

1.5 Structure of the Thesis

The remainder of the thesis is organised as follows. Chapter 2 reviews the extant literature regarding the IFRS effects on debt markets and debt covenants, and outlines the hypotheses based on the research question examined in the thesis. Chapter 3 introduces the research methodology and sample selection process. The findings are presented in Chapter 4. Chapter 5 provides some additional analyses and robustness tests. The final chapter contains the conclusions and discussion of potential future research.

CHAPTER 2 LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 Background to IFRS Adoption

The mandatory use of IFRS has been in place for more than 13 years in many countries. The introduction of these new accounting standards was strongly encouraged in order to improve comparability of corporate annual reports, to improve transparency, and to reduce information asymmetry (European Community Regulation No. 1606/2002). IFRS applied to most EU listed firms whose accounting periods ended on or after 31st December 2005. Currently, more than 140 countries have adopted IFRS, or at least have closely linked their local GAAP to IFRS (IFRS Foundation 2018).

IFRS represent a great historical transition in financial reporting and they have affected tens of thousands of firms worldwide. However, the debate about costs and benefits of IFRS has been ongoing since 2005. Policymakers aim to formulate policy based on evidence and they can look to academic researchers to provide impartial and reliable evidence for policy making.

Hundreds of papers have investigated the effects of mandatory IFRS adoption.⁸ However, relevant empirical studies are principally concerned with the implications of IFRS for equity markets. The results reported in these papers are mixed, but

⁸ Singleton-Green (2015) provides a general review of approximately 200 papers that cover the effects of mandatory IFRS adoption in the EU. This review has been helpful in summarising the relevant papers in my thesis.

generally, IFRS adoption has had positive effects on transparency, comparability, corporate investment efficiency and the cost of capital (Singleton-Green 2015). Only a few studies have focussed on the impact of IFRS on debt markets.

However, understanding the implications of mandatory IFRS adoption for debt markets is also important. Firstly, debt markets play a key role in firms' external financing and, also, accounting information is required for debt contracts (Moscariello, Skerratt and Pizzo 2014). Secondly, firms access debt markets far more frequently than they do equity markets. Florou and Kosi (2015) report that, from 2000 to 2011, the average European country had a debt market about three times the size of its equity market.⁹ Thirdly, creditors and equity investors are different parties and they have different information requirements, indicating that the findings from an examination of equity markets might not extend to debt markets. Therefore, to gain a fuller understanding of the consequences of IFRS adoption, more research should be conducted into debt markets.¹⁰

Section 2.2 covers the extant literature relating to the effects of IFRS adoption on debt markets. Section 2.3 focuses on the effects of IFRS adoption on debt covenants. Section 2.4 discusses hypothesis development.

Table 2-1 provides a summary of this literature review chapter and the extant studies relating to the effects of IFRS adoption on debt markets and debt covenants.

⁹ From 2000 to 2011, the total amount of private and public debts in the EU was 1.93 (compared with GDP), whereas the total value of shares listed on EU stock markets was 0.59.

¹⁰ Most papers in the following literature investigate the impact of IFRS in numerous countries, including European countries, Australia, South Africa, Singapore, etc.

Table 2-1

Summary of Prior Studies on the Effects of IFRS

Themes	Author(s) and Year	Sample	Relationship	Summary of Main Results
D E B T M A R K E T S Examine the Value (Credit) Relevance Change After Mandatory IFRS Adoption (Whether IFRS Numbers Better Predict a Firm's Credit Risk Than Local GAAP Numbers)	Bhat et al. (2014)	12 IFRS countries and the U.S. (Benchmark) <i>Period: 2003-2008</i>	No	This study measures credit relevance using pseudo- R^2 values derived from regressing CDS spreads. The authors find no significant differences in the relationship between accounting numbers and CDS spreads for pre- IFRS and post-IFRS periods.
	Wu and Zhang (2014)	16 voluntary IFRS adoption countries and 18 mandatory IFRS adoption countries <i>Period: 1990-2007</i>	Positive - Voluntary Positive - Mandatory (but only in high law enforcement countries)	This study measures the credit relevance of accounting information using the sensitivity of Moody's credit ratings. The authors find that the credit relevance of accounting information is significantly greater in voluntary IFRS adoption countries.
	Bhat et al. (2016)	17 IFRS countries and 4 non- IFRS countries <i>Period: 2003-2006</i>	Indirect Evidence (Positive)	This study evaluates the effects of IFRS adoption on the relationship between spread and maturity of CDS instruments. Their analysis shows that the CDS spreads in the treatment group (IFRS adoption countries) decrease.

(Continued)

Table 2-1 - Continued

Themes		Author(s) and Year	Sample	Relationship	Summary of Main Results
D E B T M A R K E T S	Examine the Value (Credit) Relevance Change After Mandatory IFRS Adoption	Kraft and Landsman (2017)	16 IFRS countries and the U.S. (benchmark) <i>Period: 2000-2012</i>	Negative	This study uses the residuals from regressing credit default swap (CDS) spreads on their determinants to measure credit relevance. The authors find that the credit relevance of the model decreases after IFRS adoption.
	(Whether IFRS Numbers Better Predict a Firm's Credit Risk Than Local GAAP Numbers)	Florou et al. (2017)	17 IFRS countries and the U.S. (benchmark) <i>Period: 2000-2009</i>	Positive	This study measures credit relevance using a pseudo- R^2 values of S&P credit ratings model estimated by ordered probit. The authors find that the credit relevance increases in IFRS countries.
	Examine Whether IFRS Affect the Costs of Debt	Kim et al. (2011) Chan et al. (2013)	Voluntary IFRS firms from 40 countries <i>Period: 1997-2005</i> 20 IFRS countries <i>Period: 2003-2007</i>	Negative Indirect Evidence (Negative)	This study finds that banks reduce loan rates for IFRS adopters but not for non-IFRS adopters. This study finds that the treatment group has a significant increase in the firms' credit ratings after IFRS adoption.

(Continued)

Table 2-1 - Continued

Themes	Author(s) and Year	Sample	Relationship	Summary of Main Results
D E B T M A R K E T S				
	Moscariello et al. (2014)	The U.K. and Italy <i>Period: 2002-2008</i>	No - The U.K. Negative - Italy	This study finds that no IFRS effect is observed in the U.K., but the cost of debt decreased in Italy. Hence, the authors suggest that IFRS effects only occur in high difference (between IFRS and local GAAP) countries.
	Chen et al. (2015)	17 IFRS countries and 14 non-IFRS countries (control) <i>Period: 2000-2011</i>	Positive	This study finds that interest rates increase by about 10 basis points after IFRS adoption, suggesting that the IFRS adoption might lead to a higher cost of debt.
	Florou and Kosi (2015)	Bonds: 16 IFRS countries and 14 non-IFRS countries (control) Loans: 17 IFRS countries and 8 non-IFRS countries (control) <i>Period: 2000-2007</i>	Negative - Public Bonds No - Private Loans	This study finds that bond yield spreads decrease after IFRS adoption, but the loan spreads remain unchanged. Therefore, the authors suggest that the IFRS adoption could reduce the cost of debt, but only for public bonds.

(Continued)

Table 2-1 - Continued

Themes		Author(s) and Year	Sample	Relationship	Summary of Main Results
D E B T M A R K E T S	Examine Whether IFRS Affect the Costs of Debt	Lamoreaux et al. (2015)	42 countries <i>Period: 1999-2008</i>	Negative	This study finds that development aid loans are greater in high quality earnings countries, in countries where there are fewer differences (between IFRS and local GAAP) and in mandatory IFRS adoption countries.
	Examine Whether IFRS Affect Firm's Capital Structure	Florou and Kosi (2015) Naranjo et al. (2018)	Bonds: 16 IFRS countries and 14 non-IFRS countries (control) Loans: 17 IFRS countries and 8 non-IFRS countries (control) <i>Period: 2000-2007</i> 32 IFRS countries <i>Period: 2001-2013</i>	Choose Public Bonds Rather Than Private Loans Choose Debt Rather Than Equity	This study finds that firms in IFRS adoption countries are more likely to choose public bonds rather than private loans. This study finds that firms with higher debt capacity issue more debt than equity compared to firms with lower debt capacity. The authors also suggest that the introduction of IFRS reduce information asymmetry and increase firms' use of external financing.

(Continued)

Table 2-1 - Continued

Themes		Author(s) and Year	Sample	Relationship	Summary of Main Results
D E B T C O V E N A N T S	Examine the Effects of Accounting Information on Debt Covenants (U.S. data)	Demerjian (2011)	The U.S. <i>Period: 1996-2007</i>	Negative - Balance Sheet Covenants No - Income Statement Covenants	This study finds that the use of balance sheet covenants declines over time, whereas income statement covenants remain stable.
		Christensen and Nikolaev (2012)	The U.S. <i>Period: 1993-2010</i>	Performance-covenants increase more than Capital-covenants	This study finds that the use of Performance-covenants (income statement related covenants) increases relative to Capital-covenants (balance sheet related covenants) as borrowers become more financially constrained.
		Demerjian (2017)	The U.S. <i>Period: 1995-2013</i>	Negative - Both Accounting and Non-Accounting Covenants	This study concludes that if IFRS improve reporting quality and thus reduce information asymmetry with regard to lending, then there should be a lesser need for future renegotiation.
	Examine the Effects of IFRS on Debt Covenants	Kim et al. (2011)	Voluntary IFRS firms from 40 countries <i>Period: 1997-2005</i>	Negative – Both Accounting and Non-Accounting Covenants	This study finds that the use of both accounting and non-accounting debt covenants declines after IFRS adoption.

(Continued)

Table 2-1 - Continued

Themes		Author(s) and Year	Sample	Relationship	Summary of Main Results
D E B T C O V E N A N T S	Examine the Effects of IFRS on Debt Covenants	Chen et al. (2015)	17 IFRS countries and 14 non-IFRS countries (control) <i>Period: 2000-2011</i>	Negative - Accounting Covenants	This study finds that the use of accounting covenants declines after IFRS adoption.
		Ball et al. (2015)	22 IFRS countries and 21 non-IFRS countries (control) <i>Period: 2001-2010</i>	Negative - Accounting Covenants No - Non-Accounting Covenants	This study finds that the use of accounting covenants as seen in both private loan and public bond samples decreased after IFRS adoption, whereas there are insignificant changes with non-accounting covenants.
		Brown (2016)	27 IFRS countries <i>Period: 2000-2012</i>	Negative - Accounting Covenants	This study finds that there is a greater decrease in the usage of accounting covenants for international loans compared with domestic loans.

2.2 IFRS Adoption Effects on Debt Markets

Although some research studies have evaluated the effects of IFRS on debt markets, the results are mixed. Christensen, Lee and Walker (2009) argue that the introduction of IFRS led to wealth transfers between debt and equity investors. In addition, the effects of IFRS on covenanted accounting ratios are uncertain. This results in risks to both borrowers and lenders.

In addition, further risks also exist because the International Accounting Standards Board (hereafter “IASB”) has made frequent changes to IFRS over the past 20 years. As a result, borrowers and lenders face uncertainty about the adoption or modification of individual IFRS standards in their respective jurisdictions.

In this section, I mainly review the prior IFRS adoption literature regarding debt markets in three areas: value relevance and accounting numbers, cost of debt, and capital structure.

2.2.1 The Effects of IFRS on Value Relevance and Accounting Numbers in Debt Markets

A vast amount of literature (e.g., Devalle, Onali and Magarini 2010; Sahut, Boulerne and Teulon 2011; Barth, Landsman, Land and Williams 2012) has evaluated whether the accounting and financial reporting information produced by IFRS is more value relevant than domestic GAAP for stock market participants. The research findings of these papers mainly suggest that mandatory IFRS adoption increases the value relevance in the equity market, and these papers also enhance

our understanding of the impacts of IFRS adoption on equity markets. However, creditors' decisions and information needs differ from those of equity investors (Hann, Hefflin and Subramanayam 2007), and hence two questions are raised by academics and practitioners. Firstly, whether IFRS adoption affects value relevance in debt markets, and, secondly, whether IFRS numbers predict different outcomes from local GAAP numbers (IFRS is expected to better predict a firm's credit risk)?

Proponents argue that IFRS is expected to improve the information available to creditors. IFRS requires recognition of more liabilities (obligations) and, additionally, IFRS provides more timely loss recognition numbers compared with most local GAAP numbers. On the other hand, IFRS places more emphasis on fair value measurement of many assets and liabilities, which might be inconsistent with the requirements of creditors. Moreover, this flexibility and managerial discretion can also reduce the verifiability and reliability of accounting numbers, which makes financial statements less useful for debtholders.

Only a few research studies examine the effects of mandatory IFRS adoption on value relevance (e.g., credit relevance) regarding debt markets. And furthermore, the results are mixed.

Like the results in the equity market, Wu and Zhang (2014) and Florou, Kosi and Pope (2017) find that IFRS adoption increases the credit relevance of accounting numbers, indicating that IFRS adoption tends to show a positive effect on debt markets. Wu and Zhang (2014) obtain data from 16 voluntary IFRS adoption

countries and 18 mandatory IFRS adoption countries from 1990 to 2007.¹¹ They measure the credit relevance of accounting information using the sensitivity of Moody's credit ratings to IFRS adoption. They find that the credit relevance of accounting information significantly increases in voluntary IFRS adoption countries. On the other hand, a similar trend also exists in mandatory IFRS adoption countries, but only in countries with high law enforcement.

Using a different methodology, Florou et al. (2017) measure credit relevance using pseudo- R^2 values of a S&P credit ratings model estimated by ordered probit. They define the credit relevance of accounting information as 'the ability of accounting numbers to explain credit ratings'. They collect data from 17 IFRS adoption countries and the U.S. (benchmark) from 2000 to 2009 and find that the credit relevance increases in IFRS countries. These results are more pronounced for higher risk debt issuers.

Conversely, Kraft and Landsman (2017) suggest that IFRS adoption reduces credit relevance. To measure credit relevance, they use the residuals from regressing credit default swap (CDS) spreads on firm size, leverage and profitability separately. Kraft and Landsman (2017) also use the U.S. as the control group, compared with 16 IFRS adoption countries. Their sample period is from 2000 to 2012. Their results show that the credit relevance of the model decreases after IFRS adoption, which is opposite to the prior two papers' findings.

¹¹ There are nine countries, namely, Finland, France, Germany, Italy, Netherlands, Norway, Sweden, Switzerland and the United Kingdom, which are found in both voluntary and mandatory adoption groups. This is because voluntary IFRS adoption occurred in these countries before mandatory IFRS adoption.

Some papers also suggest that IFRS adoption has no effect on credit relevance. Bhat, Callen and Segal (2014) utilise data from 12 IFRS adoption countries and the U.S. from 2003 through 2008, and they measure credit relevance using pseudo- R^2 values from regressing credit default swap (CDS) spreads on three essential accounting metrics: earnings, leverage and book value equity. Their results show no significant differences in the relationship between accounting numbers and CDS spreads for pre-IFRS and post-IFRS periods, indicating that IFRS adoption has no impact on credit relevance.

Furthermore, compared with Bhat et al. (2014), Bhat, Callen and Segal (2016) use a larger sample of countries (17 IFRS adoption countries and 4 non-IFRS adoption countries) but a shorter sample period (from 2003 to 2006). They follow the model from Duffie and Lando (2001) and evaluate the effects of IFRS adoption on the relationship between spread and maturity of CDS instruments. Their analysis shows that the CDS spreads in the treatment group (IFRS adoption countries) decrease, while for the control group (non-IFRS adoption countries) there is no change. They interpret these results as an increase in transparency after IFRS adoption, which provides indirect evidence as to the credit relevance of IFRS adoption.

The results derived from the above five papers covering value (credit) relevance are mixed, but they are not necessarily incompatible findings. Firstly, these five studies use different measurements to interpret credit relevance (e.g., credit risk, CDS, pseudo- R^2 values). Secondly, their sample country compositions and sample time periods are different. Thirdly, Wu and Zhang (2014) focus on both voluntary and

mandatory IFRS adoption countries, which is different from the other four studies. Fourthly, each paper has different data requirements and therefore the final samples in some papers (e.g., Bhat et al. 2014) are very small. Fifthly, the authors collect data from different databases, and the biases of the databases could also affect the results reported in these papers.

2.2.2 The Effects of IFRS on the Cost of Debt

One important expectation of capital markets is whether IFRS adoption reduces the cost of capital. Zhang (2008) suggests that investors will reduce their required rate of return from lending to firms that have a high reporting quality (e.g., more timely reporting of losses). In addition, Barth, Landsman and Land (2008) find that the cost of debt has an inverse relationship with reporting quality using accrual quality as a surrogate for reporting quality. Regulators aim to improve firms' reporting quality by implementing IFRS, and therefore changes in the cost of debt can be one measurement used to test whether IFRS adoption improves reporting quality.

Like the credit relevance and accounting numbers in Section 2.2.1, many studies (e.g., Li 2010; Daske et al. 2013; Castillo-Merino, Menendez-Plans and Orgaz-Guerrero 2014) have examined the effects of IFRS on the cost of capital in equity markets, but only a few papers focus on debt markets. The results suggest that mandatory IFRS adoption reduces the cost of equity capital, but the results of the effects of IFRS on the cost of debt are mixed.

Kim, Tsui and Yi (2011) collect debt issuance data from 40 countries from 1997 to 2005 and they examine the effects of voluntary IFRS adoption on debt markets.

They find that banks reduce loan rates for IFRS adopters but not for non-IFRS adopters. In addition, they also find the use of covenants declined after IFRS adoption. Overall, they suggest that voluntary IFRS adoption results in a lower cost of debt.

Using data from the U.K. and Italy between 2002 and 2008, Moscariello et al. (2014) point out that the effects of the mandatory adoption of IFRS are different across countries. Local GAAP in the U.K. are almost equivalent to IFRS, while local GAAP in Italy are significantly different from IFRS. They find that no IFRS effect is observed in the U.K., but the cost of debt decreased in Italy after IFRS adoption. Hence, they suggest that IFRS effects only occur in high difference (between IFRS and local GAAP) countries, and the effects of these new accounting standards result in a lower cost of debt.

Similarly, Chan, Hsu and Lee (2013) use credit ratings as a measure of transparency and the creditworthiness of borrowers to examine the effects of IFRS adoption. They collect data from 20 IFRS adoption countries from 2003 to 2007. The sample used as the treatment group is comprised of firms cross-listed in the U.S., and the control group includes U.S. firms and cross-listed firms from non-IFRS adoption countries. Chan et al. (2013) find that the treatment group reveals a significant increase in firms' credit ratings after IFRS adoption, while the control group shows an insignificant change. As the increased credit rating will improve the ability of borrowers to raise money, Chan et al. (2013) provide indirect evidence that the cost of debt might decrease after IFRS adoption.

CHAPTER 2 LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

However, some papers have different findings. Chen et al. (2015) find that interest rates increase by about 10 basis points after IFRS adoption, suggesting that the IFRS adoption might lead to a higher cost of debt. They collect their debt issuance data from 17 IFRS adoption countries (treatment) and 14 non-IFRS adoption countries (control) from 2000 to 2011. They also find a significant change in accounting covenants and loan maturity, and the details are discussed in Section 2.3.2.

Different from the papers above, Florou and Kosi (2015) examine the impacts of IFRS adoption on both public bonds and private loans by using a difference-in-difference methodology. They obtain bond issuance data from 16 IFRS adoption countries (treatment) and 14 non-IFRS adoption countries (control). For the loan sample, loan issuance data is taken from 17 IFRS adoption countries (treatment) and 8 non-IFRS adoption countries (control). The sample period is 2000-2007. Their results show that bond yield spreads decline after IFRS adoption, but the loan spreads remain unchanged. Therefore, they suggest that IFRS adoption could reduce the cost of debt, but only for public bonds.

Furthermore, Lamoreaux, Michas and Schultz (2015) use data from the World Bank and investigate the effects of IFRS adoption on international development aid loans. Their sample includes 42 countries from 1999 to 2008. Lamoreaux et al. (2015) find that the amount of development aid loans granted are greater for high quality earnings countries, lower difference (between IFRS and local GAAP) countries and for mandatory IFRS adoption countries, which suggests that IFRS adoption may reduce the cost of debt for development aid loans. However, for the countries that

are more closely aligned with U.S. geo-political interests, the role of accounting quality disappears.

Overall, like the evidence for the IFRS effects on value relevance, the evidence regarding IFRS effects on the cost of debt are also mixed. The following reasons may explain the different results: First, the sample composition and sample period are different across these papers. From Ball et al. (2015) and Chen et al. (2015), the effects of IFRS are significant only in high difference (between local GAAP and IFRS) countries.¹² Thus, if the sample includes many observations from low difference countries, it may not be easy to find any effects of IFRS adoption. Secondly, some papers (e.g., Florou and Kosi 2015) examine both public and private debt, while some papers (e.g., Kim et al. 2011; Chen et al. 2015) only focus on private loans. However, a few papers (e.g., Moscariello et al. 2014) do not mention whether their debt sample is public or private. Thirdly, some papers (e.g., Kim et al. 2015) only focus on voluntary IFRS adoption, but many other papers (e.g., Florou and Kosi 2015; Chen et al. 2015) examine the effects of mandatory IFRS adoption.

2.2.3 The Effects of IFRS on Capital Structure

Myers and Majluf (1984) suggest that higher information quality increases firms' external sources of financing. IFRS is expected to reduce information asymmetry, which would improve information quality. If that is the case, mandatory IFRS adoption should result in more external financing and affect firms' capital structure

¹² The details of Ball et al. (2015) are discussed in Section 2.3.2.

favourably. However, only a few research studies investigate the changes in external financing and capital structures after IFRS adoption.

Florou and Kosi (2015), which has been discussed in Section 2.2.2, also evaluate how IFRS adoption influences firms' choice of debt financing type (i.e., public versus private). They collect public bond issuance data from 16 IFRS adoption countries (treatment) and 14 non-IFRS adoption countries (control). For the private loan sample, loan issuance data is taken from 17 IFRS adoption countries (treatment) and 8 non-IFRS adoption countries (control). The sample period is 2000-2007. Their results show that firms in IFRS adoption countries are more likely to choose public bonds rather than private loans.

Naranjo, Saavedra and Verdi (2018) use 32 IFRS adoption countries from 2001 to 2013 and find that firms with higher debt capacity (based on a market-based probability of bankruptcy) issue more debt than equity compared with firms with lower debt capacity. They also suggest that IFRS reduce information asymmetry and increase firms' use of external financing.

Overall few studies evaluate the effects of IFRS on firms' capital structures and external financing. This may result from data limitations and because information asymmetry is difficult to measure.

2.3 IFRS Adoption Effects on Debt Covenants

Debt contracts use financial statement data from both balance sheets and income statements (Smith and Warner 1979; Leftwich 1983). To restrict managerial

actions that damage creditors and act as tripwires that give lenders a choice to renegotiate a debt contract when borrowers experience reduced financial performance, debt covenants are often used in a “direct contracting” role and these covenants are written directly using accounting variables (Demerjian 2011). In addition, Ball and Shivakumar (2008) argue that the major role of accounting information is its use in negotiating debt contracts. Moreover, the ability of accounting information to accurately forecast changes in a firm’s credit risk is vital when constructing debt covenants (George et al. 2016).

Although several papers (Demerjian 2011; Christensen and Nikolaev 2012; Givoly, Hayn and Katz 2017) investigate the effects of accounting standards on debt covenants using U.S. data, research related to the effects of IFRS on debt covenants is nascent. As there are both similarities and differences between U.S. GAAP and IFRS, not only will I review the debt covenants papers that use international data, but I will also examine US GAAP related debt covenants research. In Section 2.3.1, I cover examples of the U.S. accounting standard related literature. In Section 2.3.2, papers regarding IFRS effects on debt covenants are discussed.

2.3.1 The Effects of Accounting Information on Debt Covenants

Demerjian (2011) is one of the early papers investigating the relationship between accounting information and debt covenants. He suggests that the shift in accounting standard setting resulting from the Financial Accounting Standards Board (FASB) Conceptual Framework’s balance sheet approach to concept definition and recognition has contributed to the decrease in the usefulness of

balance sheet-based debt covenants. He collected loan issuance data from U.S. firm borrowers between 1996 to 2007 and he finds that the use of balance sheet covenants decreases, whereas the use of income statement covenants remains stable.

Most of the subsequent papers accept Demerjian's findings. Some papers suggest that the use of balance sheet-based debt covenants has declined in recent years (Christensen and Nikolaev 2012; Menon and Williams 2016; Bushman, Lerman and Zhang 2016). Moreover, some papers believe that this decline results from shifts in standards relevant to debt contracting (Christensen, Nikolaev and Moerman 2016; Demerjian, Donovan and Larson 2016). Specifically, Christensen and Nikolaev (2012) suggest that less useful accounting information leads to a decline in the incidence of balance sheet-based debt covenants. Similarly, the authors of some papers argue that an increase in the use of fair value accounting in the United States has eroded the use of balance sheet-based debt covenants (Christensen and Nikolaev 2012; Shivakumar 2013; Donelson, Mcinnis and Mergenthaler 2016).

The results of examinations of the effects of accounting information on debt covenants in the U.S. are consistent. However, the consequences and mechanisms of accounting information use in debt covenants under the framework of IFRS are still unclear. The following international studies provide some plausible explanations, such as increased transparency or the reduction of contractibility.

2.3.2 The Effects of IFRS on Debt Covenants

As discussed in Section 2.2, some papers suggest that the adoption of IFRS significantly improves financial transparency. For example, IFRS requires more detailed disclosures and recognition of additional liabilities, such as off-balance sheet transactions and pensions. Increased use of fair values leads to timelier recognition of gains and losses in the accounts. However, it remains unclear whether, apart from other financial market participants, lenders also consider that these changes provide useful information.

Kim et al. (2011) evaluate the effects of voluntary IFRS adoption on debt covenants and document that the use of both accounting and non-accounting debt covenants declined after IFRS adoption. They attribute this reduction to the greater transparency of IFRS, indicating that IFRS makes accounting numbers more useful.

Similarly, Chen et al. (2015) find that the use of accounting covenants decreases after mandatory IFRS adoption. Nevertheless, in contrast to Kim et al. (2015), they attribute the reduction in covenants use to IFRS negatively impacting some firms' accounting quality. They also find that firms which suffer a deterioration in accounting quality after IFRS adoption experience a larger decrease in accounting covenants use.

Brown (2016) collects data from 27 IFRS adoption countries from 2000 to 2012, and she also documents a decline in accounting covenants use after mandatory IFRS adoption. Specially, she finds that there is a greater decline in accounting covenants use with international loans than there is with domestic loans. She

attributes this decline to the added information risk for lenders and borrowers with international loans.

However, because Kim et al. (2011) only investigate voluntary IFRS adoption firms, their results might not be generalised to mandatory IFRS adoption firms. Voluntary IFRS adoption firms often have better reporting and better earnings quality, and hence they were willing to move from local GAAP to IFRS before 2005 to show their greater financial performance (Singleton-Green 2015). In addition, Chen et al. (2015) and Brown et al. (2016) only investigate the use of accounting covenants and they overlook non-accounting covenants. Their results may be one-sided and, moreover, the use of non-accounting covenants should also be investigated. In addition, Kim et al. (2011) and Chen et al. (2015) treat debt contracts where there is no covenant information as having zero covenant and this is unrealistic because covenant-free debts are rare. Covenant-free debts are most likely to be the result of missing data.

Ball et al. (2015) provide a new insight that mandatory IFRS adoption reduces debt contractibility. Financial statements prepared under IFRS have important limitations in terms of debt contractibility, the unique properties of which do not appear to be reflected in standard setting. According to Ball et al. (2015), managers' private information regarding the expected cash flows from an asset can be informative to many other users as well. However, at the same time the calculation of an asset's fair value based on the cash flow estimates that managers publicly disclose can lack contractibility. Ball et al. (2015) obtain both public bonds and private loans data from 22 IFRS adoption countries (treatment) and 21 non-IFRS

adoption countries (control) from 2001 to 2010. They find that the use of accounting covenants from both private loan and public bond samples declined after IFRS adoption, whereas there was an insignificant change in the use of non-accounting covenants. Therefore, Ball et al. (2015) attribute the declines to reduced contractibility rather than to increased transparency.¹³

In addition, in a recent paper, Demerjian (2017) concludes that if IFRS improves reporting quality and thus reduces information asymmetry in lending situations, then there should be a reduced need for future renegotiation. This would reduce the demand for debt contract covenants, both accounting and non-accounting. As Ball et al. (2015) document that the use of non-accounting covenants is unchanged, which is inconsistent with Demerjian's (2017) argument, it is reasonable to posit that the main effect of IFRS adoption is the reduction of contractibility, not increased transparency.

2.4 Hypothesis Development

2.4.1. IFRS Adoption and the Use of Accounting-Based Debt Covenants

Although prior papers (Chen et al. 2015; Ball et al. 2015; Brown 2016) have different viewpoints regarding the effects of IFRS on accounting covenants (e.g., increased transparency, decreased contractibility), they all find that IFRS adoption results in a decreased use of accounting covenants. Chen et al. (2015) suggest that the increased transparency and reduced information asymmetry after IFRS adoption

¹³ From Demerjian (2017), both accounting and non-accounting covenants use should decline after IFRS adoption if the reduced accounting covenants use results from increased transparency.

improves the trust that lenders have in borrowers and thereby reduces their reliance on accounting covenants. Alternatively, Ball et al. (2015) suggest that an increased managerial flexibility and greater emphasis on fair-value accounting associated with IFRS increases the uncertainty and volatility of accounting numbers in the case of debt contracts and thus reduces the use of accounting covenants. As these two different viewpoints show the same results, it can be expected that both the number and the presence of accounting covenants use will decrease after IFRS adoption. My first hypothesis is therefore as follows:

H1: The use of accounting-based debt covenants decreases after the mandatory adoption of IFRS in IFRS-adopting countries.

2.4.2 The Impact of Differences Between IFRS and Local GAAP

As discussed in Chapter 1, IFRS place more emphasis on fair value accounting, which means that accounting numbers from balance sheet items keep changing over time. This is so because these accounts are required to be revalued to fair value in every accounting period, which has an impact on balance sheets and income statements. As accounting debt covenants are based on accounting numbers, these new accounting standards increase the uncertainty and volatility of accounting ratios.

Therefore, countries with “high difference between IFRS and local GAAP” (hereafter “HighDiff”) should result in greater uncertainty and volatility than that found in “low difference between IFRS and local GAAP” (hereafter “LowDiff”) countries, when switching from local GAAP to IFRS. In addition, managers may be considered to have greater discretion in the countries with HighDiff than in the countries with

LowDiff, because firms in countries with HighDiff are required to converge more and their accounts will change more after mandatory IFRS adoption.

In 2001, Nobes investigated the differences between local GAAP and IFRS by way of a survey. In this survey, partners in large audit firms in 62 countries were asked to benchmark their local practices against both national and international accounting standards (hereafter “IAS”) in force for the financial reporting period ending 31st December 2001 (Nobes, 2001). In addition, Street (2002) interprets the survey results of Nobes (2001) and develops an index to represent the degree of difference between local GAAP and IFRS. According to Nobes (2001) and Street (2002), a high index value means that the country is HighDiff.

Ding et al. (2007) develop the measurement based on the survey in Nobes (2001). Ding et al. (2007) introduce *absence* and *divergence* as the measurements of differences between IFRS and local GAAP. *Absence* refers to cases where local GAAP has no corresponding equivalent to a requirement in IAS; *Divergence* refers to cases where local GAAP has a similar requirement to IAS but the two differ significantly. High *absence* or *divergence* indices represent HighDiff.

In addition, Bae, Tan and Welker (2008) also develop their Bae index based on Nobes (2001). The Bae Index involves a score of one for each of 21 key accounting standards of local GAAP that does not conform to IAS, which can capture meaningful

and substantive differences in recognition, measurement and disclosure rules existing in IFRS countries.¹⁴ Similarly, a high Bae Index is the same as HighDiff.

If the differences between local GAAP and IFRS are higher, there will be a greater decline in the use of accounting-based covenants because of the higher uncertainty of accounting numbers and the larger convergence needed. In contrast, if the differences between local GAAP and IFRS are lower, there will be less decline in the use of accounting-based covenants due to the lower uncertainty inherent in the switch from local GAAP to IFRS and the smaller convergence required. Therefore, my complementary hypotheses H2a and H2b are as follows:

H2a: The use of accounting-based debt covenants decreases significantly after IFRS adoption in HighDiff countries.

H2b: The use of accounting-based debt covenants shows no changes after IFRS adoption in LowDiff countries.

2.4.3 The Impact of Convergence and Enforcement

Pownall and Wieczynska (2018) find that the frequency of non-IFRS financial statements in countries that have adopted IFRS was still in excess of 17 percent in 2012. Daske et al. (2013) show that companies tend to continue with some of their previous national practices after IFRS adoption. As different countries had different local GAAP rules before the adoption of IFRS generally, it is reasonable to assume that IFRS practice will not be the same across all countries.

¹⁴ The detailed information about 21 accounting standards is provided in Appendix 3.

For the effects of enforcement across IFRS adoption on accountings covenants use, two competing arguments exist. Some argue that stronger enforcement alleviates the opportunistic use of flexibility accorded to borrowers under IFRS and thereby increases the usefulness of financial statement information for debt contracting, and hence increases contractibility. Conversely, stronger enforcement also requires borrowers to implement fair value accounting which thereby reduces the usefulness of financial statement information for debt contracting and decreases contractibility.

As discussed in Section 2.4.2, the LowDiff countries should not be affected significantly by IFRS adoption as the accounting standards remain comparatively stable from pre- to post-adoption periods. However, in HighDiff countries, accounting covenants use could have a material decrease after IFRS adoption. It is important to consider whether the enforcement level results in the decline in accounting covenants use in HighDiff countries. If the effects of IFRS on accounting covenants use can only take place when IFRS are actually adopted by firms, strong enforcement countries with HighDiff should encounter a significant decrease of accounting covenants use, while weak enforcement countries with HighDiff should keep their accounting covenants use relatively unchanged. On the other hand, some may argue that a decrease in accounting covenants use results from lenders' perceptions of risks and uncertainties in accounting numbers. In other words, providing the accounting standards have changed significantly, irrespective of whether the enforcement degree is strong or not, lenders will perceive an increased uncertainty or volatility surrounding accounting numbers, and hence reduce the use

of accounting covenants. Therefore, my competing hypotheses regarding the effects of enforcement are as follows:

H3a: The use of accounting-based debt covenants in strong enforcement countries with HighDiff has a larger decrease than that in weak enforcement countries with HighDiff.

H3b: The use of accounting-based debt covenants in strong enforcement countries with HighDiff has similar decrease as that in weak enforcement countries with HighDiff.

2.4.4 The Change in Non-Accounting Debt Covenants

Demerjian (2017) suggests that if IFRS adoption improves transparency, both accounting and non-accounting covenants should decrease, as lenders have a higher trust in borrowers if the financial information is clearer and fewer opportunities are provided for managers to make discretionary adjustments. Conversely, Ball et al. (2015) argue that IFRS place more emphasis on fair value accounting, which makes the accounting numbers less useful and hence reduces contractibility.

Examining the use of non-accounting covenants can provide some evidence to test the above two arguments. If reduced accounting covenants use results from increased transparency, non-accounting covenants use should also decrease. Conversely, the use of non-accounting covenants should remain stable or increase if the reduced accounting covenants use results from decreased contractibility. The use of non-accounting covenants might remain stable as fair value accounting has

little impact on them. On the other hand, the use of non-accounting covenants can also increase as accounting and non-accounting covenants are substitutes.¹⁵ Based on the discussion above, two competing hypotheses are proposed as follows:

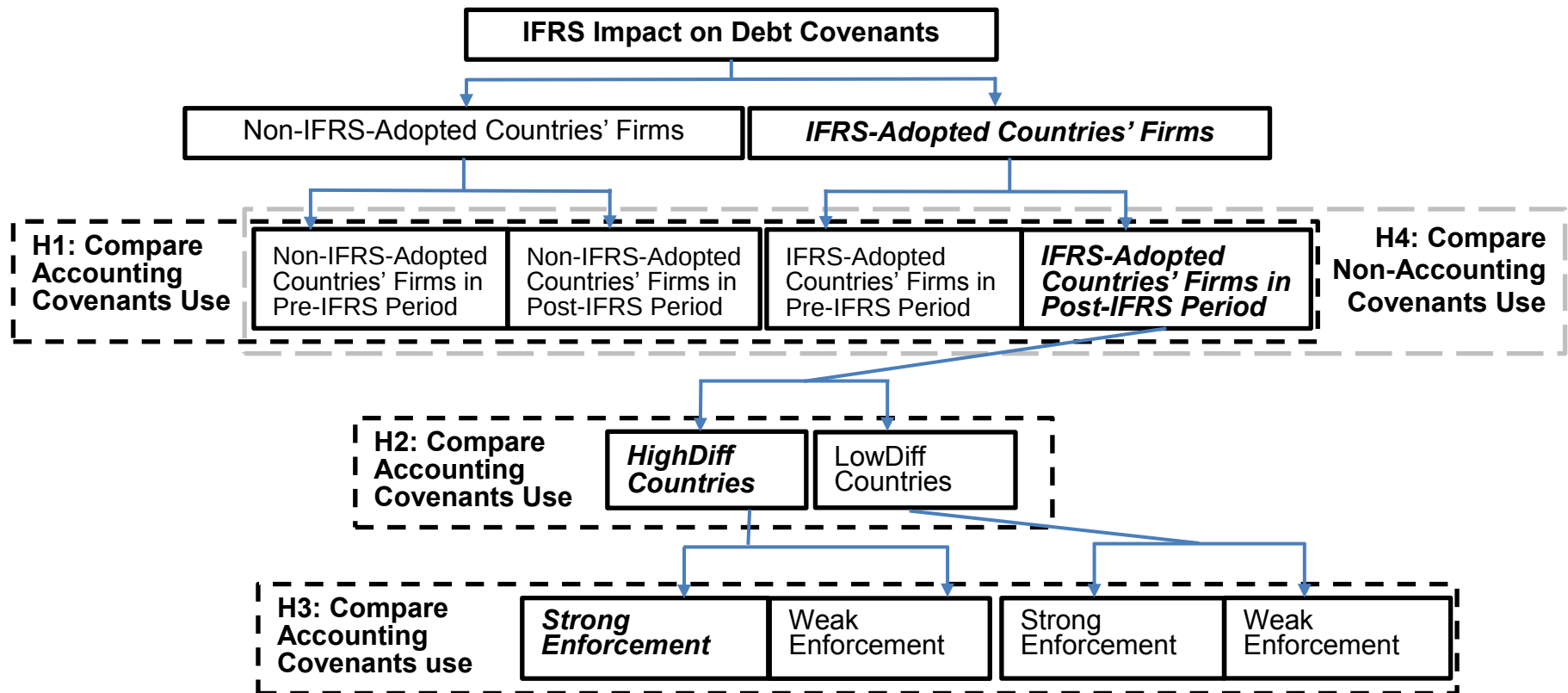
H4a: The use of non-accounting-based debt covenants decreases after the mandatory adoption of IFRS in IFRS-adopting countries.

H4b: The use of non-accounting-based debt covenants remains stable or increases after the mandatory adoption of IFRS in IFRS-adopting countries.

Figure 2-1 shows the four hypotheses and the research design of this thesis.

¹⁵ Lenders cannot trust the accounting covenants due to the uncertainty and volatility of accounting numbers. Therefore, they choose other kinds of covenants to protect themselves and thus, increases the use of non-accounting covenants.

Figure 2-1

Summary of Hypotheses and Research Design

CHAPTER 3 RESEARCH METHODOLOGY AND SAMPLE SELECTION

3.1 Research Methodology

I use the following difference-in-difference models to examine the change in accounting covenants use surrounding mandatory IFRS adoption, where debt issued in non-IFRS mandating countries is the control sample:

$$\text{Log}(1 + \text{Num_ACov}) = \beta_0 + \beta_1 \text{IFRS} + \beta_2 \text{Post_IFRS} + \beta_{3-8} \text{Firm Characteristics} + \beta_{9-17} \text{Debt Characteristics} + \text{Year Indicators} \quad (1)$$

$$\text{Pr}(D_ACov = 1) = \beta_0 + \beta_1 \text{IFRS} + \beta_2 \text{Post_IFRS} + \beta_{3-8} \text{Firm Characteristics} + \beta_{9-17} \text{Debt Characteristics} + \text{Year Indicators} \quad (2)$$

IFRS is a dummy variable indicating whether a country has adopted IFRS. *Post_IFRS* is an indicator variable (interaction), it is defined as one for observations from IFRS-mandating countries with fiscal years ending on or after the mandatory adoption date.¹⁶ I do not include a *Post* variable (indicating that observations are in the post-IFRS period from both IFRS and non-IFRS countries) in this difference-in-difference because I include year fixed effects, which means the *Post* circumstance has been considered by using year fixed effects. According to Brown (2016), the *Post* variable would simply capture the effect of the year dummy variables that were

¹⁶ *Post_IFRS* equals to *Post X IFRS*.

omitted from each regression. In Chapter 5.1, I include *Post* variable when year fixed effects are not considered in the model. My results are robust to this specification.

Equation (1) is an OLS model examining the number of accounting covenants used.¹⁷ $\text{Log}(1 + \text{Num_ACov})$ is the natural logarithm of one plus total number of accounting covenants. Equation (2) is a Probit model examining the accounting covenants presence in debt issuance contracts. In both equations, a negative (positive) β_1 indicates a lower (higher) covenants use in IFRS adoption countries, whereas a negative (positive) β_2 indicates that the use of accounting covenants decreases (increases) after mandatory IFRS adoption. I include year fixed effects to control for year-specific factors.¹⁸

I control for firm- and debt-level variables because firm and debt characteristics might affect accounting covenants use.¹⁹ For the firm-level control variables, I include total debt divided by total assets (*Leverage*), market capitalisation (*Size*), market value of equity divided by book value of equity (*MTB*), EBITDA divided by total assets (*ROA*) and net PP&E divided by total assets (*Tangibility*). These firm-level control variables are measured in the fiscal year immediately before the debt

¹⁷ The conclusions are not affected when the dependent variable is changed to *Num_ACov* in Equation (1). These results are reported in Chapter 5 and Table 5-9.

¹⁸ It is argued that fixed effects cannot be applied to a Probit model, and from Greene (2005), serious biases are in fixed effects models with Probit and Logit binary choice models. Hence, I also include the Probit model with no fixed effects in Chapter 5. However, as some accounting papers use fixed effects for the Probit model, I include year fixed effects in the main regression. In addition, I also include some other fixed effects such as country fixed effects in Chapter 5. All the results are reported in Table 5-3.

¹⁹ According to Ball et al. (2015), firms of smaller size, higher growth, less profitable, greater leverage, or have fewer tangible assets, are likely to result in higher agency costs of debt and hence greater demand for all kinds of covenants. As increased demand is for both accounting and non-accounting covenants, the coefficients in the individual type of covenants analysis (accounting or non-accounting) may not have the expected results.

issuance date.²⁰ In addition, I include an indicator variable for the availability of SEC filings, which means the firm has public equity, ADR or debt listed in the U.S. markets.²¹

To control for debt-level determinants of covenants use, I include indicators for secured debt (*D_Secured*), availability of credit ratings (*D_Rating*), investment grade (*InvestGrade*), offering yield to maturity over benchmark risk-free rate (*Yield Spread*), borrowing facility amount (*Debt Size*) and number of months to maturity (*Maturity*).²² In addition, I use indicator variables to control for loan-specific features, namely revolving loan (*Revolver*), term loan (*Term Loan*), and performance pricing (*PerfPricing*).

²⁰ Some firms may issue debt in the first firm year, and I use the accounting information in the same fiscal year as the debt issuance date for these observations.

²¹ Ball, Hail and Vasvari (2018) find that foreign firms cross-listed in the U.S. have lower interest rates for public debt issuance. In addition, Chan et al. (2013) find that, for the cross-listed in the U.S., IFRS adoption firms have a higher increase in the firms' credit ratings than that of non-IFRS adoption firms.

²² I use the variable all-in-drawn from DealScan to represent yield spread. For the investment grade, I use the average credit rating of the issue provided by Standard & Poor's, Moody's, and Fitch. Credit ratings of "BBB" or above for Standard & Poor's and Fitch and "Baa" or above for Moody's are identified as investment grade.

3.2 Data and Sample Selection

The debt issuance data is obtained from DealScan.²³ I manually match each debt issuance in non-U.S. countries with Compustat and WorldScope by using borrower name and country first, and that is augmented with a DealScan-Compustat link provided by Chava and Roberts (2008). For the U.S. firms, I use the DealScan-Compustat link to match.²⁴ Table 3-1 shows the detailed sample selection process.

For each issue, I exclude the observations with no issue date, debt amount, yield spread, covenants or maturity recorded by DealScan.²⁵ This generates 53,160 observations (69 countries, 13,711 firms and 35,377 debt contracts), including 46,180 U.S. observations and 6,980 non-U.S. observations.

I exclude debt issued by firms in financial industries (SIC 6000-6999) and use 2001-2010 as my sample period.²⁶ This results in a sample of 18,490 observations (55 countries, 5,739 firms and 12,357 debt contracts). Among them, U.S. data has reduced to 15,828 observations, whereas non-U.S. countries have 2,662 observations left.

²³ As discussed in Chapter 1, this thesis only investigates the effects of IFRS on private debt contracts due to the data availability in UNSW.

²⁴ The matching methods for U.S. firms and non-U.S. firms are consistent with Ball et al. (2015).

²⁵ From prior literature, loan issues without covenants are likely to be caused by the database failing to collect covenant information, rather than covenant-free debt.

²⁶ As the mandatory IFRS adoption date for most countries is 31st December 2005, I choose two equal time periods 2001-2005 and 2006-2010 for both IFRS adoption countries and non-IFRS adoption countries to conduct the difference-in-difference analysis. In addition, Ball et al. (2015) also use the same sample time period and their sample countries are similar to mine.

Table 3-1
Sample Selection Process

Steps	Country	Firm	Package	Observation
1. Combine all the debt issuance data from DealScan (from 1988 to 2017)	177	86,858	235,525	341,574
1.1 Drop if missing issue date	-0	-0	-0	-0
1.2 Drop if missing debt amount	-0	-346	-760	-1,533
1.3 Drop if missing yield spread	-32	-35,341	-109,123	-148,525
1.4 Drop if missing covenant information	-76	-37,340	-89,960	-137,760
1.5 Drop if missing maturity	-0	-120	-305	-596
2. Number of observations left	69	13,711	35,377	53,160
2.1 Number of observations left – U.S.	1	11,165	31,263	46,180
2.2 Number of observations left – Non-U.S.	68	2,546	4,114	6,980
3. Generate thesis' sample data	69	13,711	35,377	53,160
3.1 Drop financial industries firms (SIC 6)	-2	-2,595	-5,495	-7,188
3.2 Keep 2001-2010	-12	-5,377	-17,525	-27,482
4. Number of observations left	55	5,739	12,357	18,490
4.1 Number of observations left – Non-U.S.	54	1,125	1,572	2,662
4.1.1 Drop observations with insufficient data to calculate firm-level control variables	-16	-635	-826	-1,427
4.1.2 Require each IFRS countries to have at least one debt issue in each of the pre- and post-adoption periods	-4	-15	-28	-34
4.1.3 Require each non-IFRS countries to have at least two debt issues	-1	-1	-1	-1
4.1.4 Drop firm-years in non-IFRS countries that voluntarily used IFRS	-0	-8	-9	-11
4.1.5 Drop firm-years in IFRS countries that voluntarily used IFRS/IAS before mandatory adoption date	-0	-5	-12	-17

(Continued)

Table 3-1 – Continued

Steps	Country	Firm	Package	Observation
<i>4.1.6 Drop firm-years in IFRS countries did not use IFRS after the mandatory adoption date</i>	-0	-25	-54	-79
<i>4.1.7 Drop firm-years that did not disclose the accounting standards used</i>	-0	-2	-3	-4
Total Non-U.S. observations left	33	434	639	<u>1,089</u>
<i>4.2 Number of observations left – U.S.</i>	<i>1</i>	<i>4,614</i>	<i>10,785</i>	<i>15,828</i>
<i>4.2.1 Match with DealScan–Compustat link provided by Chava and Roberts (2008)</i>	-0	-888	-1,566	-2,584
<i>4.2.2 Drop no sufficient accounting information to calculate all firm-level control variables</i>	-0	-688	-2,005	-3,039
Total U.S. observations left	1	3,038	7,214	10,205
Randomly select U.S. observations until they comprise one-third of the total observations of non-IFRS Countries [#]	1	374	397	<u>400</u>
Final Sample	34	808	1,036	<u>1,489</u>

Table 3-1 reports the sample selection process for this thesis. “Country” means a country has debt issuance data, and a country can have more than one debt. “Firm” means a firm has issued debts during the sample period, and a firm can issue more than one debt. “Package” reports the number of debt contracts, and each debt contract can have more than one loan facility (observation). “Observation” means the number of loan facilities, and each facility has unique loan features, such as yield spread, maturity or offering amount.

[#]The reason is discussed on the next page.

I drop the observations with insufficient data to calculate all firm-level control variables (3,039 U.S. observations and 1,427 non-U.S. observations). In addition, I drop firm-year observations in non-IFRS countries that voluntarily used IFRS (11 observations), in IFRS countries that voluntarily used IFRS/IAS before mandatory adoption date (17 observations), or in IFRS countries that did not use IFRS after mandatory adoption date (79 observations). I also drop firm-years that did not disclose the accounting standards used (4 observations). This generates 10,205 U.S. observations and 1,089 non-U.S. observations.

As the number of U.S. observations is about ten times that of non-U.S. observations, it is not reasonable to use all the U.S. observations. In addition, Demerjian, Donovan and Larson (2015) also suggest that U.S. GAAP has moved increasingly toward fair value accounting, which is closer to IFRS.²⁷ However, the U.S. is a vital country and cannot be ignored. Therefore, I balance these considerations by randomly choosing U.S. data until it comprises one-third of the total non-IFRS countries observations.²⁸

The final data sample comprises 1,489 observations (34 countries, 808 firms and 1,036 debt contracts), including 290 observations (119 firms and 178 debt contracts) from 18 IFRS adoption countries and 1,199 observations (689 firms and 858 debt contracts) from 16 non-IFRS adoption countries.

²⁷ From this point, including U.S. data could taint my results in the difference-in-difference analysis, because the U.S. GAAP share some similar features with IFRS, which is not like the local GAAP in other non-IFRS countries.

²⁸ This selection method is also consistent with Ball et al. (2015). In addition, in Chapter 5, I repeat the analysis and exclude U.S. observations or include all U.S. observations. The results are reported in Table 5-2.

All non-ratio variables use U.S. dollars (million).²⁹ The amount of the debt is converted to U.S. dollars using the exchange rate on the issuance date if debt issuance was measured in a local non-U.S. dollars currency. Firm-level variables are converted from local currencies to U.S. dollars using the exchange rate at the end of the fiscal year.³⁰ All continuous variables are winsorised at the 1% and 99% levels.

I estimate standard errors clustered at the two-digit SIC industry level. In Chapter 5, I also use country-level and year-level clustering. In addition, two-way clustering (industry and year or country and year) and three-way clustering (year, country and industry) are also considered in Chapter 5.³¹

²⁹ All variables should use the same currency in the regression models.

³⁰ The firm-level accounting information is chosen from the fiscal year immediately before the debt issuance date. Only a few observations are matched with the accounting information from the current fiscal year because firms issued these debts in the first year.

³¹ The results are reported in Table 5-3.

CHAPTER 4 DESCRIPTIVE STATISTICS AND MULTIVARIATE REGRESSION RESULTS

4.1 Sample Statistics

Table 4-1 reports the distribution of the debt issuance sample by country, including IFRS adoption date, average number of accounting covenants (the mean of *Num_ACov*) per country, average of the presence of accounting covenants (the mean of *D_ACov*) per country and the comparable covenant information for income statement-based covenants and balance sheet-based covenants.³²

More than 20% of the observations (63 of 290) in IFRS adoption countries (treatment group) are from the United Kingdom. Firms in France (38), Hong Kong (38) and Netherlands (31) take up about 36.9% of the debt observations in IFRS adoption countries. On the other hand, Finland and Luxembourg account for only two observations each during the sample period, indicating that they have one debt issue in each of the pre- and post-IFRS adoption periods.³³ Most IFRS countries adopted IFRS at the end of 2005, while Singapore and New Zealand adopted IFRS in 2003 and 2007, respectively.^{34,35}

³² The observations in non-IFRS countries are larger in number than the IFRS adoption countries and this is mainly the result of U.S. and Taiwan observations. In Chapter 5, I exclude these two countries and report the results in Table 5-2.

³³ As stated in Section 3.2, I require each IFRS country to have at least one debt issue in each of the pre- and post-adoption periods (see Table 3-1, line 4.1.2).

³⁴ As New Zealand adopted IFRS at the end of 2007, the requirement for at least one debt issue in both pre- and post-IFRS periods is waived. I exclude New Zealand in Chapter 5 and the results are in Table 5-2.

³⁵ Because of IAS Plus (2018), Singapore has adopted most IFRS. But it should be noted that Singapore has made changes to the recognition and measurement principles with regard to several IFRS and have not adopted several other IFRSs. As most papers (e.g., Daske, Hail, Leuz and Verdi 2008; Ball et al. 2015) consider Singapore as an IFRS country, I follow the prior papers.

Table 4-1
Sample Composition and Accounting Covenants Use by Country

Country	Adoption Date	N	Num_ACov	D_ACov	Num_ACov_IS	D_ACov_IS	Num_ACov_BS	D_ACov_BS
Facilities in IFRS countries								
Australia	31/12/2005	20	2.200	1.000	1.300	0.800	0.900	0.750
Finland	31/12/2005	2	2.500	1.000	1.000	0.500	1.500	1.000
France	31/12/2005	38	2.184	0.921	1.921	0.921	0.263	0.263
Germany	31/12/2005	11	1.545	0.818	1.273	0.727	0.273	0.273
Hong Kong	31/12/2005	38	2.500	1.000	0.684	0.632	1.816	0.947
Ireland	31/12/2005	14	3.571	1.000	2.857	1.000	0.714	0.714
Italy	31/12/2005	14	1.214	0.714	1.071	0.714	0.143	0.143
Luxembourg	31/12/2005	2	2.500	1.000	2.000	1.000	0.500	0.500
Netherlands	31/12/2005	31	2.516	0.968	2.290	0.935	0.226	0.226
New Zealand	31/12/2007	5	1.800	1.000	1.800	1.000	0.000	0.000
Norway	31/12/2005	5	3.400	1.000	3.000	1.000	0.400	0.400
Philippines	31/12/2005	3	2.333	1.000	1.000	1.000	1.333	1.000
Singapore	31/12/2003	11	2.000	1.000	0.909	0.545	1.091	0.727
South Africa	31/12/2005	9	2.444	1.000	1.222	1.000	1.222	0.667
Spain	31/12/2005	4	1.000	0.500	1.000	0.500	0.000	0.000
Sweden	31/12/2005	11	3.273	0.909	2.727	0.909	0.545	0.364
Switzerland	31/12/2005	9	2.111	0.667	1.333	0.667	0.778	0.667
United Kingdom	31/12/2005	63	2.508	0.952	2.270	0.952	0.238	0.238
Total		290						

(Continued)

Table 4-1 — Continued

Country	Adoption Date	<i>N</i>	<i>Num_ACov</i>	<i>D_ACov</i>	<i>Num_ACov_IS</i>	<i>D_ACov_IS</i>	<i>Num_ACov_BS</i>	<i>D_ACov_BS</i>
Facilities in Non-IFRS countries								
Bermuda		35	2.400	0.971	1.629	0.886	0.771	0.686
Brazil		5	2.400	1.000	2.200	1.000	0.200	0.200
Canada		161	2.634	0.950	2.106	0.870	0.528	0.404
Cayman Islands		8	3.375	1.000	2.250	1.000	1.125	0.625
Chile		2	3.000	1.000	3.000	1.000	0.000	0.000
China		9	2.111	0.889	1.000	0.667	1.111	0.667
India		37	2.324	1.000	0.811	0.676	1.514	1.000
Indonesia		11	2.364	1.000	1.182	1.000	1.182	1.000
Japan		4	1.000	1.000	1.000	1.000	0.000	0.000
Mexico		16	2.125	0.750	2.000	0.750	0.125	0.125
Panama		3	2.000	0.667	1.667	0.667	0.333	0.333
Russia		7	2.429	1.000	2.286	1.000	0.143	0.143
South Korea		11	1.364	1.000	0.818	0.818	0.545	0.545
Taiwan		488	3.266	1.000	0.920	0.900	2.346	0.969
Thailand		2	3.000	1.000	0.000	0.000	3.000	1.000
U.S.		400	2.960	0.988	2.438	0.943	0.523	0.430
Total		1,199						

Table 4-1 shows the number of observations and the mean values of accounting covenants use by country. “IFRS countries” refers to debt issued by firms domiciled in 18 mandatory IFRS adoption countries, while “Non-IFRS countries” reports debt issued by firms domiciled in 16 countries that did not mandate IFRS during the sample period. *Num_ACov* is the average of total number of accounting-based covenants per observation (facility). *D_ACov* is a dummy variable, it equals one if the debt contract contains at least one accounting-based debt covenant, and zero otherwise. *Num_ACov_IS* is the average of total number of income statement-based covenants per observation (facility). *D_ACov_IS* is a dummy variable, it equals one if the debt contract contains at least one income statement-based covenant, and zero otherwise. *Num_ACov_BS* is the average of the total number of balance sheet-based covenants per observation (facility). *D_ACov_BS* is a dummy variable, it equals one if the debt contract contains at least one balance sheet-based covenant, and zero otherwise.

Ireland has the highest *Num_ACov* (3.571), indicating that on average, each debt issue contains more than 3 accounting covenants in Ireland's observations (of loan facilities). Conversely, Spain and Italy have only 1.000 and 1.214 in *Num_ACov*, which means each observation in these two countries contains approximately one accounting covenant which is low.

For the non-IFRS adoption countries, 74% of the observations are from the U.S. and Taiwan (400 and 488 of 1199, respectively), while 8 countries in the non-IFRS group have less than ten observations between 2001 and 2010. In the non-IFRS adoption countries, the Cayman Islands (3.375) and Taiwan (3.266) have more than 3 accounting covenants in each debt issue, whereas Japan (1.000) and South Korea (1.364) have approximately one accounting covenant in each debt issue.

From Table 4-1, firms in more than 55% of the IFRS-adopting countries use at least one accounting covenant ($D_ACov = 1$ in 10 of 18 countries) in all the debt issuances. Similarly, D_ACov equals one in about 60% (10 out of 16) of the non-IFRS countries. Generally, the average number of income statement-based covenants (*Num_Acov_IS*) is higher than that of balance sheet-based covenants (*Num_Acov_BS*) in both IFRS and non-IFRS countries. A similar result is also found with regard to the presence of income sheet (D_Acov_IS) and balance sheet covenants (D_Acov_BS).³⁶

Table 4-2 shows the distribution of the debt issuance sample by the calendar year of debt issuance. A decrease can be seen after 2005 in the average number of

³⁶ D_Acov_IS exceeds D_Acov_BS for 13 of 18 IFRS countries and 11 of 16 non-IFRS countries.

accounting covenants (*Num_ACov*) in IFRS countries (2.48 to 2005; 1.98 after 2005), but not in non-IFRS countries (2.85 to 2005; 2.99 after 2005). A similar trend can also be found in the average presence of accounting covenants (*D_ACov*).

Table 4-2
Sample Composition and Accounting Covenants Use by Year

Year	N	<i>Num_ACov</i>	<i>D_ACov</i>	<i>Num_Acov_IS</i>	<i>D_Acov_IS</i>	<i>Num_Acov_BS</i>	<i>D_Acov_BS</i>
Facilities in IFRS countries							
2001	41	2.341	0.902	1.634	0.780	0.707	0.415
2002	46	2.717	1.000	1.891	0.913	0.826	0.652
2003	54	2.574	0.963	2.000	0.815	0.574	0.426
2004	42	2.190	0.952	1.595	0.929	0.595	0.381
2005	38	2.579	1.000	1.632	0.842	0.947	0.632
2006	25	2.040	0.760	1.880	0.760	0.160	0.160
2007	11	2.364	0.727	2.091	0.727	0.273	0.273
2008	14	2.357	0.929	1.786	0.857	0.571	0.500
2009	6	1.833	1.000	1.167	1.000	0.667	0.667
2010	13	1.308	0.923	1.154	0.846	0.154	0.154
Mean (01-05)		2.48	0.96	1.75	0.86	0.73	0.50
Mean (06-10)		1.98	0.87	1.62	0.84	0.37	0.35
Facilities in Non-IFRS countries							
2001	75	2.893	0.960	2.080	0.880	0.813	0.627
2002	67	3.015	0.985	2.313	0.910	0.701	0.597
2003	70	2.686	0.957	2.071	0.857	0.614	0.486
2004	95	3.000	0.989	2.463	0.926	0.537	0.432
2005	89	2.652	0.978	1.955	0.865	0.697	0.494
2006	83	2.771	0.940	2.241	0.892	0.530	0.446
2007	157	2.764	0.994	1.567	0.917	1.197	0.605
2008	162	3.210	0.988	1.420	0.877	1.790	0.772
2009	164	3.311	0.994	1.116	0.939	2.195	0.872
2010	237	2.907	0.996	1.114	0.895	1.793	0.844
Mean (01-05)		2.85	0.97	2.18	0.89	0.67	0.53
Mean (06-10)		2.99	0.98	1.49	0.90	1.50	0.71

Table 4-2 shows the number of observations and mean values for accounting covenants use by calendar years according to debt issuance date. “IFRS countries” refers to debt issued by firms domiciled in 18 mandatory IFRS adoption countries, while “Non-IFRS countries” refers to debt issued by firms domiciled in 16 countries that did not mandate IFRS during the sample period. *Num_ACov* is the average of the total number of accounting-based covenants per observation (facility). *D_ACov* is a dummy variable, it equals one if the debt contract contains at least one accounting-based debt covenant, and zero otherwise. *Num_Acov_IS* is the average of the total number of income statement-based covenants per observation (facility). *D_Acov_IS* is a dummy variable, it equals one if the debt contract contains at least one income statement-based covenant, and zero otherwise. *Num_Acov_BS* is the average of the total number of balance sheet-based covenants per observation (facility). *D_Acov_BS* is a dummy variable, it equals one if the debt contract contains at least one balance sheet-based covenant, and zero otherwise.

The highest two *Num_ACov* in IFRS countries are in 2002 (2.717) and 2005 (2.579), both of which are in the pre-IFRS period, while the lowest *Num_ACov* values are in 2009 (1.833) and 2010 (1.308), that is the last two years of the post-IFRS period. In non-IFRS countries, each year has a similar *Num_ACov*, and the highest number is in 2009 (3.311), whereas the lowest number is in 2003 (2.652).³⁷ In general, *Num_ACov_IS* is higher than *Num_ACov_BS* in both IFRS adoption and non-IFRS adoption countries in every year. In addition, the number of debt issues decreases dramatically in IFRS countries after 2005, but not in non-IFRS countries.^{38,39}

Figure 4-1 plots the average number (Panel A) and presence (Panel B) of accounting covenants use in both IFRS and non-IFRS countries. The vertical lines represent the IFRS adoption date for most countries.⁴⁰ From Panel A of Table 4-1, the average number of accounting covenants in IFRS countries has a downward trend after 2005, while non-IFRS countries almost maintain stability. Similarly, Panel B of Figure 4-1 shows that, before the IFRS adoption date, the average presence of

³⁷ From Table 4-2, a difference of *Num_ACov* can be found for the periods 2006-2008 and 2009-2010; and in addition, *D_ACov* also show a difference for the periods 2006-2007 and 2008-2010. I use two additional tests in Table 5-4, which indicates that my results are robust to the number of years used in post-IFRS period.

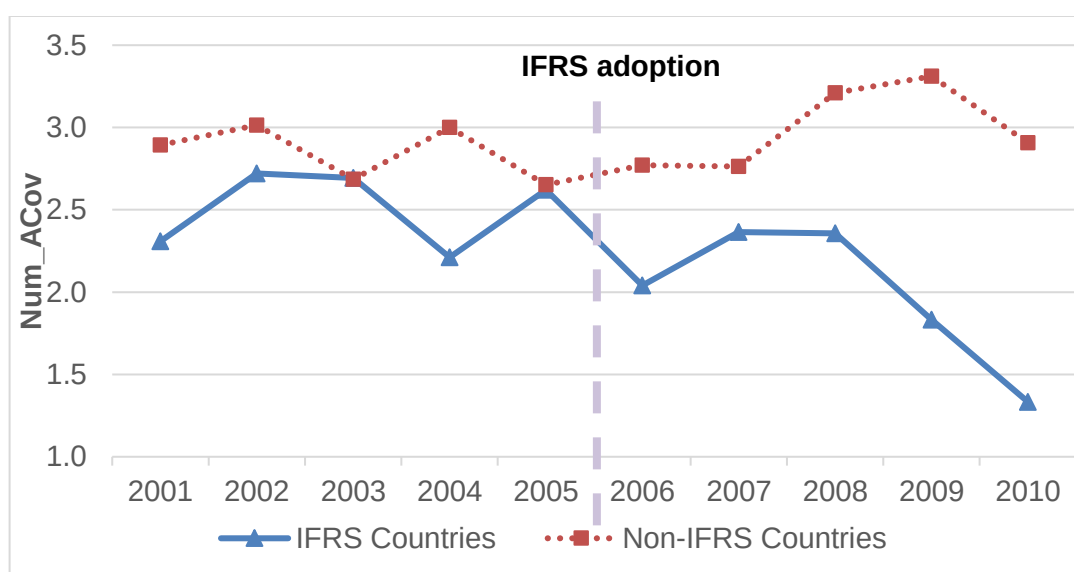
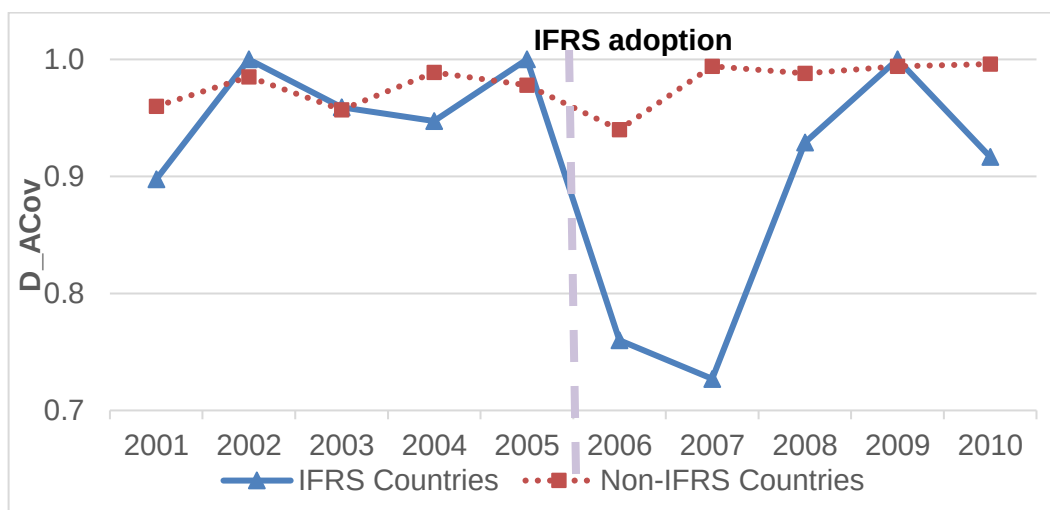
³⁸ The main reason for the large decrease of observations in IFRS countries after 2005 is that many firms keep using local GAAP after the mandatory adoption of IFRS, and these observations are dropped (as shown in 4.1.6 of Table 3-1). In addition, this decrease is consistent with a similar decrease reported in table 2 of Ball et al. (2015). Ball et al. (2015) are not concerned by this decrease.

³⁹ Non-IFRS countries show an upward trend in the number of debt issuances. The reason for this is that 485 out of 488 Taiwan facilities (observations) were issued after 2005. In Chapter 5, I exclude Taiwan and, as a result, the numbers of observations for non-IFRS countries in both pre- and post-IFRS periods are similar. The results are reported in Table 5-2.

⁴⁰ Singapore adopted IFRS in 2003 and New Zealand adopted IFRS in 2007. Because of this, I exclude these two countries from the sample taken when constructing the figure. As these two countries account for only about 5% of the total IFRS adoption sample, the exclusion has little impact on the outcome and the conclusions of this thesis are unaffected.

accounting covenants is almost the same for both groups of countries, but the average presence (D_ACov) declines in IFRS countries after 2005 while it remains relatively unchanged in non-IFRS countries.

Figure 4-1

*Accounting Covenants Use by Year***Panel A: Average Number of Accounting Covenants Use (Num_ACov)****Panel B: Average Presence of Accounting Covenants Use (D_ACov)**

4.2 Univariate Analysis

Table 4-3 reports univariate statistics for the debt-specific variables for the IFRS and non-IFRS country samples.⁴¹ In IFRS countries, the average number of accounting covenants (*Num_ACov*) decreases from 2.458 to 2.054 after IFRS adoption. The difference is statistically significant (t-statistic = -2.45). Although this decrease suggests that IFRS themselves have a negative impact on debt covenants use, I also examine non-IFRS countries as a check on whether the declining trend also occurs in those countries, perhaps as part of a worldwide trend.⁴² Therefore, my conclusions are based on difference-in-difference analyses (the last two columns of Table 4-3) and on multivariate analyses that control for debt and firm characteristics, as well as fixed effects (in the following sections of Chapter 4).

Similarly, the average presence of accounting covenants (*D_ACov*) also declines (from 0.963 to 0.851, t-statistic = -3.40) after IFRS adoption, which is similarly statistically significant. The same decline can be found in the average number of balance sheet-based covenants (*Num_ACov_BS*), which decreases from 0.713 to 0.351 (t-statistic = -3.42) after IFRS adoption. This preliminary analysis is consistent with Demerjian (2011) and Christensen and Nikolaev (2012), since they suggest that fair value accounting has a greater impact on balance sheets, which reduces the use of balance sheet covenants. Conversely, as the income statement

⁴¹ For IFRS countries, post-adoption period means observations taken from the IFRS countries with fiscal years ending on or after the mandatory adoption date, while for non-IFRS countries, the post-adoption period refers to the observations taken from non-IFRS countries with fiscal year ends on or after 31st December 2005.

⁴² If only IFRS countries are considered, other factors that also affect accounting covenants use at the same time as IFRS are adopted may be overlooked.

numbers are not affected significantly by fair value accounting, both the average of income statement covenants and their presence (Num_ACov_IS / D_ACov_IS) only show an insignificant decrease (t-statistic = -0.39 / -0.56).

For the non-IFRS countries, the average number of accounting covenants (Num_ACov) increases from 2.826 to 3.009 (t-statistic = 2.71). Similarly, there is an insignificant increase in the average presence of accounting covenants (D_ACov) (0.975 to 0.988, t-statistic = 1.63). Income statement covenants (2.174 to 1.381, t-statistic = -11.81) and balance sheet covenants (0.667 to 1.626, t-statistic = 14.86) show opposite and significant changes. These results indicate that the decrease in the use of accounting covenants around IFRS adoption is not part of a global trend.

For the univariate difference-in-difference analysis, the number of observations in each of the difference-in-difference cells are:⁴³

	Pre-Adoption	Post-Adoption
Facilities in IFRS Countries	216	74
Facilities in Non-IFRS Countries	396	803

⁴³ As 485 out of 488 Taiwan facilities (observations) were issued after 2005, the number of observations in the post-adoption period is much greater than that in the pre-adoption period in non-IFRS countries. If Taiwan is excluded, the two periods have a similar number of observations.

Table 4-3
Univariate Analysis

Variable	Preadoption Period			Postadoption Period			Difference (Post-Pre)		Diff-in-Diff (IFRS-Non-IFRS)	
	<i>N</i>	mean	Std Dev	<i>N</i>	mean	Std Dev	mean	<i>t</i>	mean	<i>t</i>
Facilities in IFRS countries										
<i>Num_ACov</i>	216	2.458	1.192	74	2.054	1.313	-0.404	-2.45	-0.587	-3.52
<i>D_ACov</i>	216	0.963	0.189	74	0.851	0.358	-0.112	-3.40	-0.124	-5.35
<i>Num_ACov_IS</i>	216	1.769	1.255	74	1.703	1.247	-0.066	-0.39	0.727	4.36
<i>D_ACov_IS</i>	216	0.852	0.356	74	0.824	0.383	-0.028	-0.56	-0.043	-0.92
<i>Num_ACov_BS</i>	216	0.713	0.858	74	0.351	0.508	-0.362	-3.42	-1.321	-8.88
<i>D_ACov_BS</i>	216	0.486	0.501	74	0.338	0.476	-0.148	-2.22	-0.375	-5.45
<i>Investment Rstr</i>	216	0.093	0.291	74	0.081	0.275	-0.012	-0.30	0.161	3.35
<i>Asset Sale Rstr</i>	216	0.273	0.447	74	0.338	0.476	0.065	1.06	0.264	4.32
<i>Equity Issue Rstr</i>	216	0.282	0.451	74	0.324	0.471	0.042	0.68	0.206	3.78
<i>Debt Issue Rstr</i>	216	0.236	0.426	74	0.311	0.466	0.075	1.27	0.220	3.85
<i>Prepayment Rstr</i>	216	0.171	0.378	74	0.284	0.454	0.112	2.10	0.257	4.49
<i>D_Secured</i>	216	0.282	0.451	74	0.378	0.488	0.096	1.55	0.179	2.49
<i>D_Rating</i>	216	0.204	0.404	74	0.068	0.253	-0.136	-2.72	-0.051	-1.13
<i>InvestGrade</i>	216	0.176	0.382	74	0.054	0.228	-0.122	-2.59	-0.052	-1.33
<i>Yield Spread</i>	216	1.432	1.332	74	1.646	1.251	0.214	1.21	0.777	4.17
<i>Log (Debt Size)</i>	216	5.053	2.033	74	5.772	1.610	0.718	2.76	2.900	7.91
<i>Maturity</i>	216	45.875	22.994	74	46.459	23.135	0.584	0.19	-8.089	-2.61
<i>Revolver</i>	216	0.468	0.500	74	0.486	0.503	0.019	0.28	0.067	0.90
<i>Term Loan</i>	216	0.375	0.485	74	0.270	0.447	-0.105	-1.63	-0.212	-2.91
<i>PerfPricing</i>	216	0.505	0.501	74	0.486	0.503	-0.018	-0.27	0.299	4.44
Firm-level Characteristics										
<i>Size</i>	216	0.301	2.047	74	1.077	1.715	0.777	2.93	2.376	5.32
<i>MTB</i>	216	1.568	5.409	74	4.323	9.231	2.756	3.10	8.141	1.26
<i>Leverage</i>	216	0.287	0.169	74	0.310	0.188	0.022	0.96	0.024	0.80
<i>ROA</i>	216	0.113	0.098	74	0.136	0.093	0.023	1.74	0.048	2.71
<i>Tangibility</i>	216	0.301	0.236	74	0.324	0.265	0.023	0.70	-0.001	-0.04
<i>USFiling</i>	216	0.500	0.501	74	0.378	0.488	-0.122	-1.81	0.327	4.78

(Continued)

Table 4-3 — Continued

Variable	Preadoption Period			Postadoption Period			Difference (Post-Pre)	
	N	mean	Std Dev	N	mean	Std Dev	mean	t
Facilities in Non-IFRS countries								
Num_ACov	396	2.826	1.309	803	3.009	0.982	0.183	2.71
D_ACov	396	0.975	0.157	803	0.988	0.111	0.013	1.63
Num_ACov_IS	396	2.174	1.315	803	1.381	0.967	-0.793	-11.81
D_ACov_IS	396	0.889	0.315	803	0.904	0.295	0.015	0.82
Num_ACov_BS	396	0.667	0.746	803	1.626	1.173	0.960	14.86
D_ACov_BS	396	0.520	0.500	803	0.747	0.435	0.227	8.08
Investment Rstr	396	0.253	0.435	803	0.080	0.271	-0.173	-8.42
Asset Sale Rstr	396	0.351	0.478	803	0.152	0.359	-0.199	-8.06
Equity Issue Rstr	396	0.255	0.436	803	0.091	0.288	-0.164	-7.77
Debt Issue Rstr	396	0.273	0.446	803	0.127	0.333	-0.146	-6.34
Prepayment Rstr	396	0.283	0.451	803	0.138	0.345	-0.145	-6.14
D_Secured	396	0.629	0.484	803	0.545	0.498	-0.083	-2.75
D_Rating	396	0.146	0.354	803	0.061	0.240	-0.085	-4.93
InvestGrade	396	0.109	0.312	803	0.039	0.193	-0.070	-4.78
Yield Spread	396	2.030	1.318	803	1.467	1.206	-0.563	-7.37
Log (Debt Size)	396	4.305	1.932	803	2.123	2.858	-2.182	-13.73
Maturity	396	43.836	23.008	803	52.509	18.932	8.673	6.94
Revolver	396	0.500	0.501	803	0.452	0.498	-0.048	-1.57
Term Loan	396	0.376	0.485	803	0.483	0.500	0.107	3.52
PerfPricing	396	0.535	0.499	803	0.218	0.413	-0.317	-11.66
Firm-level Characteristics								
Size	396	3.476	3.602	803	1.877	3.009	-1.599	-8.10
MTB	396	6.985	82.219	803	1.600	14.113	-5.385	-1.80
Leverage	396	0.311	0.237	803	0.310	0.189	-0.001	-0.09
ROA	396	0.126	0.135	803	0.101	0.118	-0.025	-3.31
Tangibility	396	0.380	0.229	803	0.405	0.225	0.024	1.76
USFiling	396	0.831	0.375	803	0.382	0.486	-0.448	-16.13

(Continued)

Table 4-3 — Continued

Table 4-3 shows univariate difference-in-difference results for debt specific variables. IFRS countries include those countries where debt is issued by firms domiciled in 18 mandatory IFRS adoption countries. The pre-adoption period refers to the fiscal years ending before the mandatory adoption date (see Table 4-1) and the post-adoption period refers to fiscal years ending on or after the mandatory adoption date. Non-IFRS countries report debt issued in those countries by firms domiciled in 16 countries that did not mandate IFRS in the sample period. The pre-adoption period refers to fiscal years ending before 31st December 2005 and the post-adoption period covers fiscal years ending on or after 31st December 2005. *Num_ACov* is the average of the total number of accounting-based covenants per observation (facility). *D_ACov* is a dummy variable, it equals one if the debt contract contains at least one accounting-based debt covenant, and zero otherwise. *Num_ACov_IS* is the average of the total number of income statement-based covenants per observation (facility). *D_ACov_IS* is a dummy variable, it equals one if the debt contract contains at least one income statement-based covenant (e.g., interest coverage, EBITDA, fixed charge coverage, etc.), and zero otherwise. *Num_ACov_BS* is the average of the total number of balance sheet-based covenants per observation (facility). *D_ACov_BS* is a dummy variable, it equals one if the debt contract contains at least one balance sheet-based covenant (e.g., debt to equity ratio, leverage ratio, current ratio, net worth, etc.), and zero otherwise. The “Difference” column shows the differences in mean values between pre- and post-adoption periods by using a t-test. The “Diff-in-Diff” column compares the mean difference-in-difference in IFRS countries and non-IFRS countries by using a t-test. *Investment Rstr* is a dummy variable, it equals one if the debt contract contains at least one “Max Capex” covenant, and zero otherwise. *Asset Sale Rstr* is a dummy variable, it equals one if the debt contract contains at least one “AssetSalesSweep” covenant, and zero otherwise. *Equity Issue Rstr* is a dummy variable, it equals one if the debt contract contains at least one “EquityIssuanceSweep” covenant, and zero otherwise. *Debt Issue Rstr* is a dummy variable, it equals one if the debt contract contains at least one “DebtIssuanceSweep” covenant, and zero otherwise. *Prepayment Rstr* is a dummy variable, it equals one if the debt contract contains at least one “ExcessCFSweep” or “InsuranceProceedsSweep” covenant, and zero otherwise. *D_Secured* is a dummy variable, it equals one if the debt contract is secured, and zero otherwise. *D_Rating* is a dummy variable, it equals one if credit ratings are available for the issued debt at the time of issuance, and zero otherwise. *InvestGrade* is a dummy variable, it equals one if the average credit rating for the issued debt at the time of issuance is of investment grade (“BBB” or above for Standard & Poor’s), and zero otherwise. *Yield Spread* is all-in-drawn for the debt. *Log (Debt Size)* is the natural logarithm of borrowing facility amount (in million U.S. dollars). *Maturity* is debt maturity in number of months. *Revolver*, *Term Loan*, and *PerfPricing* are dummy variables indicating the loan contract has a revolving feature, a term feature, and a performance pricing feature, respectively. *Size* is the natural logarithm of market capitalisation (in millions of U.S. dollars). *MTB* is market capitalisation to book value of equity. *Leverage* is total debt divided by total assets. *ROA* is EBITDA divided by total assets. *Tangibility* is net PP&E divided by total assets. *USFiling* is a dummy variable, it equals one if an observation is taken from a firm also has SEC filing available, and zero otherwise. All continuous variables are winsorised at the 1st and 99th percentiles. The number in bold indicates it is significant at the 1% level.

The difference-in-difference results indicate that both the average number *Num_ACov* (t-statistic = -3.52) and the presence *D_ACov* (t-statistic = -5.35) of accounting covenants decreases significantly after IFRS adoption. Similar decreases can be found in balance sheet covenants (t-statistic = -8.88 / -5.45), while for the presence of income statement covenants, the fall in *Num_ACov_IS* in non-IFRS countries significantly exceeds that in IFRS countries (t-statistic = 4.36) while for *D_ACov_IS* the two groups do not change significantly.

These univariate difference-in-difference analyses provide preliminary evidence to support my hypothesis that IFRS adoption results in a decrease in accounting covenants use, but the decline seems concentrated in balance sheet covenants.

4.3 Accounting Covenants Use: Difference-in-Difference Regression Model Results

Table 4-4 shows the regression results for Equation (1) and marginal effects for Equation (2). The coefficients on *Post_IFRS* are negative and significant in both equations, which is consistent with H1 that the use of accounting covenants declines after mandatory IFRS adoption. From the OLS model, the coefficient on *Post_IFRS* is -0.181 (t-statistic = -2.51), indicating that IFRS adoption reduced the average number of accounting covenants by 18.1%, after controlling for other factors (e.g., firm and debt characteristics). Similarly, the coefficient on *Post_IFRS* of *D_ACov* is -0.768 (t-statistic = -2.05).

Table 4-4
Difference-in-Difference Analysis of Accounting Covenants Use

	Expected Sign	OLS: Log (1 + Num_Acov)	Probit: D_ACov
<i>IFRS</i>	?	0.013 (0.26)	0.313 (0.96)
<i>Post_IFRS</i>	?	-0.181** (-2.51)	-0.768** (-2.05)
<i>Size</i>	+/-	0.009 (1.49)	0.092*** (2.91)
<i>MTB</i>	+/-	0.002 (0.46)	0.061*** (2.88)
<i>Leverage</i>	+	0.057 (0.93)	0.702 (1.21)
<i>ROA</i>	+	0.155 (1.39)	-1.104 (-1.00)
<i>Tangibility</i>	-	-0.093 (-1.49)	-0.196 (-0.53)
<i>USFiling</i>	+/-	0.019 (0.55)	-0.091 (-0.61)
<i>D_Secured</i>	+/-	0.037* (1.74)	-0.205 (-0.95)
<i>D_Rating</i>	+/-	-0.065 (-1.14)	3.459*** (14.61)
<i>InvestGrade</i>	-	-0.208** (-2.62)	-3.678*** (-10.40)
<i>Yield Spread</i>	+	0.014 (0.88)	0.044 (0.76)
<i>Log (Debt Size)</i>	-	-0.055*** (-6.45)	-0.366*** (-6.09)
<i>Log (Maturity)</i>	+	0.041* (1.68)	0.412*** (3.78)
<i>Revolver</i>	+/-	0.071* (1.75)	0.109 (0.41)
<i>Term Loan</i>	+/-	0.082* (1.83)	0.066 (0.27)
<i>PerfPricing</i>	+	0.204*** (6.93)	0.590*** (2.82)
<i>Constant</i>		1.074*** (11.29)	1.373** (2.39)
Fixed effects		Year	Year
F / Wald Chi ² - Statistics		31.15	3993.04
N		1,489	1,489
Adj. / Pseudo R ²		24.3%	35.1%

(Continued)

Table 4-4 – Continued

Table 4-4 shows the multivariate difference-in-difference regression analysis. I use the OLS model for regressions on the natural logarithm of $1 + \text{Num_ACov}$. *Num_ACov* is the number of accounting-based debt covenants per observation (facility). I also use a Probit model for regressions on the binary variable *D_ACov*. *D_ACov* is a dummy variable, it equals one if the debt contract contains at least one accounting-based debt covenant, and zero otherwise. *IFRS* equals one for observations taken from IFRS adoption country during the sample period, and zero otherwise. *Post_IFRS* equals one for observations taken from IFRS countries in the post-adoption period, and zero otherwise. *Size* is the natural logarithm of market capitalisation (in millions of U.S. dollars). *MTB* is market capitalisation to book value of equity. *Leverage* is total debt divided by total assets. *ROA* is EBITDA divided by total assets. *Tangibility* is net PP&E divided by total assets. *USFiling* is a dummy variable, it equals one if an observation taken from a firm also has SEC filing available, and zero otherwise. *D_Secured* is a dummy variable, it equals one if the debt contract is secured, and zero otherwise. *D_Rating* is a dummy variable, it equals one if credit ratings are available for the issued debt at the time of issuance, and zero otherwise. *InvestGrade* is a dummy variable, it equals one if the average credit rating for the issued debt at the time of issuance is of investment grade (“BBB” or above for Standard & Poor’s), and zero otherwise. *Yield Spread* is all-in-drawn for the debt. *Log (Debt Size)* is the natural logarithm of the borrowing facility amount (in millions of U.S. dollars). *Log (Maturity)* is the natural logarithm of debt maturity in number of months. *Revolver*, *Term Loan*, and *PerfPricing* are dummy variables indicating the loan contract has a revolving feature, a term feature, and a performance pricing feature, respectively. Opposing arguments exist for some variables (or different directions of coefficients exist in different papers), and the expected signs are +/- . Standard errors are clustered by industry (two-digit SIC). All continuous variables are winsorised at the 1st and 99th percentiles. The coefficients and the t-value of the test variable are highlighted in bold. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

The *InvestGrade* in both models shows a significant decrease, indicating that high credit rating debt contains fewer accounting covenants. This is consistent with my expectation that lenders have fewer concerns if the credit ratings for debt are high, and hence fewer covenants are required for the debt. The coefficients on *Log (Maturity)* in both models are positive and significant, indicating that a longer debt term may increase a lender's concerns, and hence more covenants are required.⁴⁴

The adjusted R^2 in the OLS model and the pseudo R^2 in the Probit model are 24.3% and 35.1%, respectively. This indicates that these models explain an important part of the variation in accounting covenants use. In addition, combined with univariate analysis (which excludes all control variables and fixed effects), the results suggest that *Post_IFRS* alone still explains the significant decrease in accounting covenants use.

4.4 The Impact of Differences Between IFRS and Local GAAP on Accounting Covenants Use

As stated in Section 2.4.2, if the changes in accounting covenants result from IFRS adoption, they should be more pronounced if the differences between IFRS and local GAAP (hereafter "Diff") are greater. To examine this possibility, I use four methods to classify IFRS countries as "high difference between IFRS and local GAAP" (hereafter "HighDiff") and "low difference between IFRS and local GAAP"

⁴⁴ In Table 4 of Ball et al. (2015), they also have similar results for *Log (Debt size)* and *Perfpricing*. Following Ball et al. (2015), Chen et al. (2015) and Brown (2016), coefficients for control variables in my later tables are omitted for brevity. Also for the sake of brevity, I have adopted the criterion that to qualify for discussion in the text, a control variable must be significant in both models.

(hereafter “LowDiff”).⁴⁵ H2 predicts that HighDiff countries will show a significant decrease in the use of accounting covenants after IFRS adoption while LowDiff should not change significantly. The four different classifications of HighDiff and LowDiff countries are shown in Table 4-5.⁴⁶

Ball et al. (2015) and Brown (2016) only use the Bae index to measure the differences between local GAAP and IFRS. However, results may change if the classifications of HighDiff and LowDiff vary. Therefore, as stated in Section 2.4.2, I use four methods to classify countries.⁴⁷

Table 4-5

Classification of HighDiff and LowDiff Countries

Panel A: Classification (1)				Panel B: Classification (2)			
HighDiff		LowDiff		HighDiff		LowDiff	
Country	N	Country	N	Country	N	Country	N
Finland	2	Australia	20	Australia	20	Hong Kong	38
France	38	Hong Kong	38	Finland	2	Ireland	14
Germany	11	Ireland	14	France	38	Netherlands	31
Italy	14	Netherlands	31	Germany	11	New Zealand	5
Luxembourg	2	New Zealand	5	Italy	14	Norway	5
Philippines	3	Norway	5	Luxembourg	2	Singapore	11
Spain	4	Singapore	11	Philippines	3	South Africa	9
Sweden	11	South Africa	9	Spain	4	Sweden	11
Switzerland	9	United Kingdom	63	Switzerland	9	United Kingdom	63
Total	94	Total	196	Total	103	Total	187

(Continued)

⁴⁵ The detailed criteria for each classification are shown in Appendix 1.

⁴⁶ As discussed in Chapter 2, I follow Nobes (2001), Street (2002), Ding et al. (2007), Bae et al. (2008) and I use the sample medians from each of the four measurements as the classification criteria to categorise HighDiff and LowDiff Countries. There are six classifications at first, but three of them have the same countries in HighDiff and LowDiff groups, and thus the total number of classifications is four. The first classification result is based on the Bae Index from Bae et al. (2008). The second classification result comes from three measurements (but these three measurements have the same classification of HighDiff and LowDiff countries), namely, the Nobes Index as in Nobes (2001) and Street (2002), the *Absence* index in Ding et al. (2007) and the Total (Total *Absence* and *Divergence*) Index in Ding et al. (2007). The third classification result is also based on the Nobes Index in Street (2002). The fourth classification result is based on the *Divergence* Index in Ding et al. (2007). The detailed criteria for each classification are shown in Appendix 1.

⁴⁷ Classification (1) is based on the Bae Index, and the results in Column (1) in Table 4-6 are also consistent with those in Ball et al. (2015) and Brown (2016).

Table 4-5 – Continued

Panel C: Classification (3)				Panel D: Classification (4)			
HighDiff		LowDiff		HighDiff		LowDiff	
Country	N	Country	N	Country	N	Country	N
Australia	20	Hong Kong	38	Finland	2	Australia	20
Finland	2	Ireland	14	France	38	Hong Kong	38
France	38	Netherlands	31	Germany	11	Netherlands	31
Germany	11	New Zealand	5	Ireland	14	New Zealand	5
Italy	14	Norway	5	Italy	14	Norway	5
Luxembourg	2	Philippines	3	Luxembourg	2	Philippines	3
Spain	4	Singapore	11	Spain	4	Singapore	11
Sweden	11	South Africa	9	Switzerland	9	South Africa	9
Switzerland	9	United Kingdom	63	United Kingdom	63	Sweden	11
Total	111	Total	179	Total	157	Total	133

I then evaluate whether the coefficient on *Post_IFRS* of Table 4-4 varies among these groups. I divide *Post_IFRS* into two indicator variables *Post_IFRS_{HD}* and *Post_IFRS_{LD}*. *Post_IFRS_{HD}* (*Post_IFRS_{LD}*) equals one for observations from HighDiff (LowDiff) countries in the post-adoption period, and zero otherwise. Equations are as follows.

$$\text{Log}(1 + \text{Num_ACov}) = \beta_0 + \beta_1 \text{IFRS} + \beta_2 \text{Post_IFRS}_{HD} + \beta_3 \text{Post_IFRS}_{LD} + \beta_{4-9} \text{Firm Characteristics} + \beta_{10-18} \text{Debt Characteristics} + \text{Year Indicators} \quad (3)$$

$$\text{Pr}(D_ACov = 1) = \beta_0 + \beta_1 \text{IFRS} + \beta_2 \text{Post_IFRS}_{HD} + \beta_3 \text{Post_IFRS}_{LD} + \beta_{4-9} \text{Firm Characteristics} + \beta_{10-18} \text{Debt Characteristics} + \text{Year Indicators} \quad (4)$$

Table 4-6 reports the regression coefficients for OLS model and Probit model. Column (1) ((2) / (3) / (4)) of both OLS and Probit models in Table 4-6 show the results of the Classification (1) ((2) / (3) / (4)) in Panel A (B / C / D) of Table 4-5.

Table 4-6
The Impact of Differences Between IFRS and Local GAAP

	OLS: Log (1 + Num_Acov)				Probit: D_Acov			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
<i>IFRS</i>	0.010 (0.20)	0.010 (0.19)	0.009 (0.17)	0.014 (0.26)	0.257 (0.80)	0.270 (0.82)	0.245 (0.74)	0.300 (0.92)
<i>Post_IFRS_{HD}</i>	-0.422*** (-4.40)	-0.293*** (-2.72)	-0.331*** (-2.84)	-0.259*** (-2.84)	-1.462*** (-3.50)	-1.177*** (-3.10)	-1.316*** (-3.34)	-1.029** (-2.34)
<i>Post_IFRS_{LD}</i>	-0.035 (-0.53)	-0.084 (-1.17)	-0.059 (-0.94)	-0.037 (-0.43)	0.253 (0.43)	-0.150 (-0.28)	0.274 (0.45)	0.001 (0.00)
All control variables included								
Fixed effects: Year								
F / Wald Chi ² - Statistics	28.80	27.67	26.20	31.08	4397.58	3990.79	4569.97	3084.31
N	1,489	1,489	1,489	1,489	1,489	1,489	1,489	1,489
Adj. / Pseudo R ²	25.5%	24.6%	24.9%	24.6%	38.1%	36.4%	37.6%	36.1%
Test for difference: <i>Post_IFRS_{HD}</i> = <i>Post_IFRS_{LD}</i>								
[p-value]	[0.00]	[0.06]	[0.01]	[0.06]	[0.00]	[0.02]	[0.00]	[0.10]
F / Chi ² - Statistics	18.59	3.79	6.72	3.73	15.87	5.52	12.28	2.67

Table 4-6 has IFRS countries classified as HighDiff and LowDiff groups, plus non-IFRS countries (difference-in-difference analysis). Columns (1), (2), (3) and (4) in each of the models represent one kind of classification into HighDiff and LowDiff, consistent with the classifications used in Table 4-5. *IFRS* equals one for observations from IFRS adoption country during the sample period, and zero otherwise. *Post_IFRS_{HD}* (*Post_IFRS_{LD}*) are for observations taken from HighDiff (LowDiff) countries in the post-adoption period and are zero otherwise. This table shows regression coefficients for an OLS model and a Probit model, and t- or z-statistics (in parentheses) based on standard errors clustered by industry (two-digit SIC). Year fixed effects and all control variables are included. This table also shows p-values of an F-test or χ^2 test from testing the null hypothesis of whether *Post_IFRS_{HD}* = *Post_IFRS_{LD}* and clustering standard errors by industry. All continuous variables are winsorised at the 1st and 99th percentiles. The coefficients of test variables are highlighted in bold. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

From Table 4-6, in OLS models, coefficients on $Post_IFRS_{HD}$ in all classifications are negative and significant -0.422 / -0.293 / -0.331 / -0.259 (t-statistic = -4.40 / -2.72 / -2.84 / -2.84), while in LowDiff countries, the coefficients are insignificant. A similar decrease can be found in the Probit models, where the coefficients on $Post_IFRS_{HD}$ are -1.462 / -1.177 / -1.316 / -1.029 (t-statistic = -3.50 / -3.10 / -3.34 / -2.34). By using an F-test (χ^2 test), the null hypothesis that $Post_IFRS_{HD} = Post_IFRS_{LD}$ is rejected in all specifications, indicating that the reduction of accounting covenants use is more pronounced in HighDiff countries, which is consistent with the H2a and H2b. In addition, these results also suggest that the HighDiff values can be one important reason in explaining the decrease in accounting covenants.

4.5 The Impact of Enforcement on Accounting Covenants Use

In addition to examining the effects of differences between IFRS and local GAAP, it is also reasonable to consider whether the degree of enforcement can also affect accounting covenants use. As discussed in H3a, only in the countries that ensure firms effectively do adopt IFRS, can the effects of IFRS actually be seen. Strong enforcement (hereafter “StrongEnf”), rather than weak enforcement (hereafter “WeakEnf”) can ensure that firms make the actual changes, and then IFRS can begin to take effect and impact the accounting covenants use. Hence, the effects of IFRS are expected to be found in the high enforcement countries in H3a.

On the other hand, as discussed in H3b, no matter whether the degree of enforcement is strong or not, providing lenders perceive an increased uncertainty or volatility surrounding accounting numbers, they would reduce the use of accounting

covenants. In this competing scenario, StrongEnf and WeakEnf from HighDiff countries may both indicate significant decreases in accounting covenants use. Table 4-7 shows the classifications of enforcement degree and reports the StrongEnf and WeakEnf groups, as well as the legal system used by each country.

Table 4-7

Classification of StrongEnf and WeakEnf Countries

StrongEnf			WeakEnf		
Country	Legal System	N	Country	Legal System	N
Australia	Common Law	20	Finland	Code Law	2
France	Code Law	38	Hong Kong	Common Law	38
Germany	Code Law	11	Ireland	Common Law	14
Italy	Code Law	14	Netherlands	Code Law	31
Norway	Code Law	5	Philippines	Code Law	3
Spain	Code Law	4	South Africa	Common Law	9
Switzerland	Code Law	9	Sweden	Code Law	11
United Kingdom	Common Law	63			
Total		164	Total		108

The classification of enforcement level is based on the Total Enforcement Index in 2005 from Brown et al. (2014).⁴⁸ I use the sample median of the Total Enforcement Index as the classification criteria for the StrongEnf and WeakEnf countries.⁴⁹ If the country's index number is above (equal/below) the median number, it is classified as a StrongEnf (WeakEnf) country.

⁴⁸ Luxembourg is excluded as it is not included in the Brown et al. (2014) study. As the Total Enforcement Index was measured in 2005, Singapore is excluded because the adoption of IFRS in that country took place in 2003. New Zealand is excluded because of its late adoption of IFRS in 2007, compared with other countries generally where the adoption took place earlier. Given that these three countries only have 2 observations in the post-adoption period (only 2.7% of the total observations from IFRS countries in the post-adoption period), the regression results and conclusions very likely would not be affected if they were included.

⁴⁹ The detailed information regarding the Total Enforcement Index is provided in Appendix 2.

As discussed in Section 4.4, the use of accounting covenants should show little change in LowDiff countries because LowDiff would not result in material uncertainties or volatilities in accounting numbers, while in HighDiff countries, as the accounting standards changed significantly after IFRS adoption, lenders would perceive much greater risks and uncertainties in accounting numbers and thus reduce the use of accounting covenants. Additionally, as discussed in H3a, even for HighDiff countries, if the degree of enforcement is low, the effects of IFRS could not actually take place and thus accounting covenants use may not change significantly, whereas in the strong enforcement countries with HighDiff, IFRS were seriously and actually adopted, and therefore the use of accounting covenants should show a significant decrease.

I classify HighDiff countries as “HighDiff with StrongEnf” (hereafter “HDSE”) and “HighDiff with WeakEnf” (hereafter “HDWE”) groups. LowDiff countries still remain in Equation (5) because accounting covenants use may continue to be stable in these countries. In addition, to examine whether the degree of enforcement (strong versus weak) also affects accounting covenants use in LowDiff countries, I classify LowDiff countries as “LowDiff with StrongEnf” (hereafter “LDSE”) and “LowDiff with WeakEnf” (hereafter “LDWE”) in Equation (6). The equations are as follows:

$$\begin{aligned} \text{Log}(1 + \text{Num_ACov}) = & \beta_0 + \beta_1 \text{IFRS} + \beta_2 \text{Post_IFRS}_{\text{HDSE}} + \beta_3 \text{Post_IFRS}_{\text{HDWE}} + \beta_4 \\ & \text{Post_IFRS}_{\text{LD}} + \beta_{5-10} \text{Firm Characteristics} + \beta_{11-19} \text{Debt Characteristics} + \text{Year} \\ & \text{Indicators} \end{aligned} \quad (5)$$

Table 4-8
The Impact of Enforcement

Panel A: HighDiff with StrongEnf or WeakEnf countries, and LowDiff countries				
	OLS: Log (1 + Num_Acov)			
	(1)	(2)	(3)	(4)
<i>IFRS</i>	0.025 (0.47)	0.024 (0.45)	0.023 (0.43)	0.027 (0.51)
<i>Post_IFRS_{HDSE}</i>	-0.525*** (-5.28)	-0.382*** (-3.16)	-0.382*** (-3.17)	-0.362*** (-4.13)
<i>Post_IFRS_{HDWE}</i>	-0.189 (-0.67)	0.101 (0.64)	-0.291 (-0.54)	0.264*** (3.03)
<i>Post_IFRS_{LD}</i>	-0.044 (-0.63)	-0.093 (-1.21)	-0.068 (-0.99)	-0.033 (-0.38)
All control variables included				
Fixed effects: Year				
F-Statistics	38.34	27.66	28.78	29.98
<i>N</i>	1,471	1,471	1,471	1,471
Adj. <i>R</i> ²	26.3%	25.3%	25.3%	25.9%
Panel B: HighDiff countries with StrongEnf or WeakEnf, and LowDiff countries with StrongEnf or WeakEnf				
	OLS: Log (1 + Num_Acov)			
	(1)	(2)	(3)	(4)
<i>IFRS</i>	0.024 (0.46)	0.024 (0.45)	0.022 (0.42)	0.029 (0.56)
<i>Post_IFRS_{HDSE}</i>	-0.524*** (-5.30)	-0.382*** (-3.17)	-0.382*** (-3.17)	-0.365*** (-4.19)
<i>Post_IFRS_{HDWE}</i>	-0.190 (-0.67)	0.100 (0.63)	-0.293 (-0.54)	0.256*** (2.90)

(Continued)

Table 4-8 – Continued

<i>Post_IFRS_{LDSE}</i>	-0.071	-0.131	-0.132	0.167*
	(-0.74)	(-1.29)	(-1.30)	(1.96)
<i>Post_IFRS_{LDWE}</i>	-0.003	-0.052	-0.002	-0.118
	(-0.03)	(-0.51)	(-0.02)	(-1.28)
All control variables included				
Fixed effects: Year				
F-Statistics	49.95	30.25	30.05	28.49
<i>N</i>	1,471	1,471	1,471	1,471
Adj. <i>R</i> ²	26.2%	25.3%	25.4%	26.0%

Table 4-8 shows the effects of enforcement on accounting covenants use by using difference-in-difference analysis. Panel A classifies HighDiff countries as StrongEnf and WeakEnf groups. In addition, Panel B also classifies LowDiff countries as StrongEnf and WeakEnf groups. Column (1) ((2) / (3) / (4)) in Table 4-8 represents the same Diff classification in Column (1) ((2) / (3) / (4)) of Table 4-6, which is also consistent with the classifications of Table 4-5. *IFRS* equals one for observations from IFRS adoption country during the sample period, and zero otherwise. *Post_IFRS_{HDSE}* (*Post_IFRS_{HDWE}*) equals one for observations from the HighDiff countries with a strong (weak) degree of enforcement in the post-adoption period, and zero otherwise. *Post_IFRS_{LDSE}* (*Post_IFRS_{LDWE}*) equals one for observations from the LowDiff countries with a strong (weak) degree of enforcement in the post-adoption period, and zero otherwise. *Post_IFRS_{LD}* equals one for observations from LowDiff countries in the post-adoption period, and zero otherwise. Standard errors are clustered by industry (two-digit SIC). Year fixed effects and all control variables are included. All continuous variables are winsorised at the 1st and 99th percentiles. The coefficients of test variables are highlighted in bold. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

$$\begin{aligned} \text{Log}(1 + \text{Num_ACov}) = & \beta_0 + \beta_1 \text{IFRS} + \beta_2 \text{Post_IFRS}_{HDSE} + \beta_3 \text{Post_IFRS}_{HDWE} + \beta_4 \\ & \text{Post_IFRS}_{LDSE} + \beta_5 \text{Post_IFRS}_{LDWE} + \beta_{6-11} \text{Firm Characteristics} + \beta_{12-20} \text{Debt} \\ & \text{Characteristics} + \text{Year Indicators} \end{aligned} \quad (6)$$

The results of Equations (5) and (6) are reported in Table 4-8.⁵⁰ Post_IFRS_{HDSE} (Post_IFRS_{HDWE}) is defined as one for observations from the HighDiff IFRS countries with a strong (weak) degree of enforcement in the post-adoption period, and zero otherwise. Similarly, Post_IFRS_{LDSE} (Post_IFRS_{LDWE}) is defined as one for observations taken from the LowDiff IFRS countries with a strong (weak) degree of enforcement in the post-adoption period, and zero otherwise. Post_IFRS_{LD} equals one if observations from IFRS countries with a low difference between local GAAP and IFRS are in the post-adoption period, and zero otherwise.

From Table 4-8, Column (1) ((2) / (3) / (4)) represents the same classification in Column (1) ((2) / (3) / (4)) of Table 4-6 and they are also consistent with the classifications of Table 4-5. In Panel A of Table 4-8, coefficients on Post_IFRS_{HDSE} in all classifications are negative and significant -0.525 / -0.382 / -0.382 / -0.362 (t-statistic = -5.28 / -3.16 / -3.17 / -4.13). But for both Post_IFRS_{HDWE} and Post_IFRS_{LD} , the coefficients are insignificant in all but one specification.⁵¹

Panel B of Table 4-8 shows similar results. Only the coefficients on Post_IFRS_{HDSE} are negative and significant -0.524 / -0.382 / -0.382 / -0.365 (t-

⁵⁰ When combining enforcement degree and Diff, each group does not have a large number of observations. Thus, I do not use D_ACov because the absence of accounting covenants is rare and the results from the Probit model are less useful when the number of observations is small.

⁵¹ Only the coefficient on Post_IFRS_{HDSE} in column (4) is positive and significant. It may be the result of the small number of observations in this group (only a few observations in WeakEnf countries with HighDiff).

statistic = -5.30 / -3.17 / -3.17 / -4.19). For all the other three test variables (*Post_IFRS_{HDWE}*, *Post_IFRS_{LDSE}* and *Post_IFRS_{LDWE}*), the coefficients are insignificant in almost all specifications.⁵²

These results support H3a that even in HighDiff countries, the use of accounting-based debt covenants only significantly declines in strong enforcement countries and not in weak enforcement countries, indicating that in addition to the possible changes from local GAAP to IFRS, lenders also focus on the actual change from accounting standards brought about by high enforcement.

4.6 Changes in Non-Accounting Covenants Use

As stated in Section 2.4.4, one plausible method to examine whether the decreased accounting covenants use results from reduced contractibility or increased transparency is to test changes in non-accounting covenants use.

Table 4-9 shows the results of non-accounting covenants use.⁵³ $\text{Log}(1 + \text{Num_NACov})$ is the logarithm of one plus total number of non-accounting covenants. *D_NACov* is a dummy variable, defined as one if the observation (facility) contains at least one non-accounting covenant, and zero otherwise.

⁵² Similar to Panel A of Table 4-8, only column (4) of Panel B has any significant coefficients. But as they are positive and the number of observations in these group is not large, my conclusion is not affected.

⁵³ Table 4-9 shows the results without control variables. The results remain stable if firm-level control variables are included.

Table 4-9
Non-Accounting Covenants Use

	OLS:	Probit:			Probit:		
	Log (1 + <i>Num_NACov</i>)	<i>D_NACov</i>	Investment Rstr	Asset Sale Rstr	Equity Issue Rstr	Debt Issue Rstr	Prepayment Rstr
<i>IFRS</i>	-0.130 (-1.37)	-0.177 (-1.02)	-0.707*** (-3.16)	-0.222 (-1.32)	0.062 (0.33)	-0.120 (-0.69)	-0.357** (-1.98)
<i>Post_IFRS</i>	0.347** (2.09)	0.637* (1.92)	0.552 (1.36)	0.553 (1.64)	0.570* (1.84)	0.514* (1.87)	0.547 (1.62)
Fixed effects: Year							
F / Wald Chi ² - Statistics	21.29	134.92	71.02	104.70	102.38	78.81	62.06
N	1,489	1,489	1,489	1,489	1,489	1,489	1,489
Adj. / Pseudo R ²	10.7%	12.4%	9.4%	9.1%	10.3%	7.2%	7.7%

Table 4-9 shows the multivariate difference-in-difference regression analysis. I use an OLS model for regressions on the natural logarithm of $1 + \text{Num_NACov}$. *Num_NACov* is the number of non-accounting-based debt covenants per observation (facility). I also use a Probit model for regressions on the binary variable *D_NACov*. *D_NACov* is a dummy variable, it equals one if the debt contract contains at least one non-accounting-based debt covenant, and zero otherwise. *IFRS* equals one for an observation taken from an IFRS adoption country during the sample period, and zero otherwise. *Post_IFRS* equals one for an observation taken from the IFRS countries in the post-adoption period, and zero otherwise. *Investment Rstr* is a dummy variable, it equals one if the debt contract contains at least one “Max Capex” covenant, and zero otherwise. *Asset Sale Rstr* is a dummy variable, it equals one if the debt contract contains at least one “AssetSalesSweep” covenant, and zero otherwise. *Equity Issue Rstr* is a dummy variable, it equals one if the debt contract contains at least one “EquityIssuanceSweep” covenant, and zero otherwise. *Debt Issue Rstr* is a dummy variable, it equals one if the debt contract contains at least one “DebtIssuanceSweep” covenant, and zero otherwise. *Prepayment Rstr* is a dummy variable, it equals one if the debt contract contains at least one “ExcessCFSweep” or “InsuranceProceedsSweep” covenant, and zero otherwise. Standard errors are clustered by industry (two-digit SIC). All continuous variables are winsorised at the 1st and 99th percentiles. The coefficients and the t-value of the test variable are highlighted in bold. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

From Table 4-9, the coefficients of *Post_IFRS* in both OLS and Probit models are positive and significant 0.347 / 0.637 (t-statistic = 2.09 / 1.92), indicating that non-accounting covenants use increased after IFRS adoption. These results are consistent with my expectation that IFRS adoption reduces debt contractibility as the use of non-accounting covenants increases, which is also consistent with H4b. These results suggest that increased transparency in equity markets may not be extended to debt contracts as non-accounting covenants use does not decrease.

In addition, the coefficients on all five non-accounting covenants are positive. However, not all coefficients are significant. But this should result from the disaggregation problem. In getting down to small sample sizes of firms using a particular non-accounting covenant, statistical power is reduced.

The results from Table 4-9 support H4b that non-accounting covenants use increases after IFRS adoption in IFRS countries. These results also suggest that reduced contractibility, not increased transparency, is the main reason for the decreased use of accounting covenants.

CHAPTER 5 ADDITIONAL ANALYSES AND ROBUSTNESS TESTS

5.1 The Changes in Accounting Covenants Use in Non-IFRS Adoption Countries

Although I find a decreased use of accounting covenants by using difference-in-difference analyses in Chapter 4, it is still important to check whether non-IFRS countries change significantly after IFRS adoption. If accounting covenants use increases significantly in non-IFRS countries, it can also result in a decreased use of accounting covenants by IFRS countries in difference-in-difference analyses. Therefore, I use the following equations to examine whether covenants use changed in non-IFRS countries.

$$\text{Log}(1 + \text{Num_ACov}) = \beta_0 + \beta_1 \text{Pre_NonIFRS} + \beta_2 \text{Post_NonIFRS} + \beta_3 \text{Post_IFRS} + \beta_{4-9} \text{Firm Characteristics} + \beta_{10-18} \text{Debt Characteristics} \quad (7)$$

$$\text{Pr}(D_ACov = 1) = \beta_0 + \beta_1 \text{Pre_NonIFRS} + \beta_2 \text{Post_NonIFRS} + \beta_3 \text{Post_IFRS} + \beta_{4-9} \text{Firm Characteristics} + \beta_{10-18} \text{Debt Characteristics} \quad (8)$$

The coefficients on *Pre_NonIFRS* and *Post_NonIFRS* in the OLS model of Table 5-1 are insignificant (t-statistic = -0.32 / 0.25). Similar insignificant results (t-statistic = -1.00 / -0.77) can be found in the Probit model. By using an F-test (χ^2 test), the null hypothesis that *Pre_NonIFRS* = *Post_NonIFRS* is accepted in both models, indicating that almost no change can be found in non-IFRS countries in pre- and post-adoption periods. These results also support my conclusions derived from the main regression models in Chapter 4.

Table 5-1
Accounting Covenants Use in Non-IFRS Countries

	OLS: Log (1 + Num_Acov)	Probit: D_Acov
<i>Pre_NonIFRS</i>	-0.016 (-0.32)	-0.316 (-1.00)
<i>Post_NonIFRS</i>	0.013 (0.25)	-0.208 (-0.77)
<i>Post_IFRS</i>	-0.167*** (-2.89)	-0.719** (-2.44)
All control variables included		
F / Wald Chi ² - Statistics	19.02	1239.44
N	1,489	1,489
Adj. / Pseudo R ²	23.7%	32.5%
Test for difference: <i>Pre_NonIFRS</i> = <i>Post_NonIFRS</i>		
[p-value]	[0.49]	[0.69]
F / Chi ² - Statistics	0.47	0.16

Table 5-1 shows the use of accounting covenants in non-IFRS countries. *Pre_NonIFRS* equals one for observations from the non-IFRS countries in the pre-adoption period, and zero otherwise. *Post_NonIFRS* equals one for observations from the non-IFRS countries in the post-adoption period, and zero otherwise. *Post_IFRS* equals one for observations from the IFRS countries in the post-adoption period, and zero otherwise. This table shows regression coefficients for the OLS model and the Probit model, and t- or z-statistics (in parentheses) based on standard errors clustered by industry (two-digit SIC). All control variables are included. This table also shows p-values for an F-test or χ^2 test resulting from testing the null hypothesis of whether *Pre_NonIFRS* = *Post_NonIFRS* while clustering standard errors by industry. All continuous variables are winsorised at the 1st and 99th percentiles. The coefficients of test variables are highlighted in bold. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

5.2 Alternative Sample Tests

From Table 4-1, two countries, namely, the U.S. and Taiwan, have 400 and 488 observations, respectively, which accounts for about 60% of the total observations. In addition, 485 out of 488 Taiwan facilities (observations) were issued after 2005, so the number of observations in the post-adoption period is much larger than that in the pre-adoption period in non-IFRS countries. On the other hand, some countries (e.g., Finland, Luxembourg, Chile) have very small numbers of observations. Therefore, in this part, I re-run Equations (1) – (4) for all the following situations and report the results in Table 5-2.

Panels A and B in Table 5-2 show the results without Taiwan or U.S. observations, respectively. Panel C of Table 5-2 shows the results after excluding both Taiwan and the U.S. observations. Panel D of Table 5-2 shows the results after excluding countries with no more than five observations. Panel E of Table 5-2 shows the results after including all U.S. observations.

From Table 5-2, the coefficients on *Post_IFRS* in DID (difference-in-difference) analysis are all negative and generally significant in every specification. However, I also note that in the Probit model, excluding the U.S. observations would make the significance of the coefficient on *Post_IFRS* disappear. In addition, when including all U.S. data, the significant coefficient on *Post_IFRS* in the OLS model also disappears. The main possible reason is that the U.S. data is very different from the data sourced from other countries. As the results are unchanged in almost all specifications, my conclusions from Chapter 4 continue to hold.

Table 5-2
Alternative Sample Tests

Panel A: Drop Taiwan										
	OLS: Log (1 + Num_Acov)					Probit: D_Acov				
	DID	(1)	(2)	(3)	(4)	DID	(1)	(2)	(3)	(4)
<i>IFRS</i>	0.017 (0.31)	0.013 (0.24)	0.013 (0.24)	0.012 (0.22)	0.018 (0.33)	0.304 (0.92)	0.249 (0.76)	0.261 (0.79)	0.237 (0.71)	0.290 (0.88)
<i>Post_IFRS</i>	-0.147** (-2.03)					-0.735* (-1.92)				
<i>Post_IFRS_{HD}</i>		-0.380*** (-3.97)	-0.247** (-2.30)	-0.284** (-2.43)	-0.223** (-2.45)		-1.426*** (-3.34)	-1.142*** (-2.94)	-1.282*** (-3.18)	-0.993** (-2.22)
<i>Post_IFRS_{LD}</i>		-0.008 (-0.11)	-0.062 (-0.85)	-0.038 (-0.59)	-0.006 (-0.07)		0.272 (0.46)	-0.122 (-0.23)	0.294 (0.48)	0.029 (0.05)
All control variables included										
Fixed effects: Year										
F / Wald Chi ² - Statistics	16.36	25.56	16.55	16.58	18.47	4288.95	4285.70	4233.21	4610.25	3242.10
N	1,001	1,001	1,001	1,001	1,001	1,001	1,001	1,001	1,001	1,001
Adj. / Pseudo R ²	20.8%	22.2%	21.1%	21.4%	21.2%	29.1%	32.3%	30.5%	31.8%	30.2%
Test for difference: <i>Post_IFRS_{HD}</i> = <i>Post_IFRS_{LD}</i>										
[p-value]		[0.00]	[0.09]	[0.02]	[0.06]		[0.00]	[0.02]	[0.00]	[0.10]
F / Chi ² - Statistics		17.22	2.98	5.50	3.68		15.82	5.49	12.22	2.67
Panel B: Drop the U.S.										
	OLS: Log (1 + Num_Acov)					Probit: D_Acov				
	DID	(1)	(2)	(3)	(4)	DID	(1)	(2)	(3)	(4)
<i>IFRS</i>	0.054 (0.82)	0.054 (0.82)	0.050 (0.77)	0.049 (0.74)	0.057 (0.89)	0.272 (0.70)	0.220 (0.58)	0.229 (0.59)	0.204 (0.52)	0.253 (0.67)
<i>Post_IFRS</i>	-0.232** (-2.39)					-0.612 (-1.39)				
<i>Post_IFRS_{HD}</i>		-0.470*** (-4.31)	-0.332*** (-2.72)	-0.369*** (-2.86)	-0.315*** (-2.89)		-1.218*** (-2.67)	-0.991** (-2.34)	-1.118** (-2.54)	-0.814 (-1.59)

(Continued)

Table 5-2 – Continued

<i>Post_IFRS_{LD}</i>		-0.092 (-0.97)	-0.141 (-1.37)	-0.114 (-1.19)	-0.088 (-0.78)		0.349 (0.51)	-0.011 (-0.02)	0.387 (0.56)	0.063 (0.10)	
All control variables included											
Fixed effects: Year											
F / Wald Chi ² - Statistics	29.23	47.81	29.20	27.61	29.63	8643.63	13505.62	10266.36	14040.69	7169.25	
N	1,089	1,089	1,089	1,089	1,089	1,024	1,024	1,024	1,024	1,024	
Adj. / Pseudo R ²	29.4%	31.0%	29.8%	30.1%	29.9%	38.8%	41.6%	40.1%	41.3%	39.5%	
Test for difference: <i>Post_IFRS_{HD}</i> = <i>Post_IFRS_{LD}</i>											
[p-value]		[0.00]	[0.09]	[0.02]	[0.07]		[0.00]	[0.03]	[0.00]	[0.16]	
F / Chi ² - Statistics		15.97	3.04	5.73	3.54		11.20	4.59	9.33	1.96	
Panel C: Drop both Taiwan and the U.S.											
		OLS: Log (1 + Num_Acov)					Probit: D_Acov				
		DID	(1)	(2)	(3)	(4)	DID	(1)	(2)	(3)	(4)
<i>IFRS</i>		0.040 (0.62)	0.039 (0.60)	0.037 (0.55)	0.035 (0.52)	0.044 (0.69)	0.253 (0.64)	0.205 (0.53)	0.213 (0.54)	0.189 (0.47)	0.233 (0.60)
<i>Post_IFRS</i>		-0.167* (-1.71)					-0.549 (-1.21)				
<i>Post_IFRS_{HD}</i>			-0.396*** (-3.77)	-0.260** (-2.22)	-0.297** (-2.37)	-0.249** (-2.34)		-1.154** (-2.45)	-0.926** (-2.12)	-1.055** (-2.32)	-0.751 (-1.43)
<i>Post_IFRS_{LD}</i>			-0.035 (-0.36)	-0.082 (-0.76)	-0.056 (-0.55)	-0.025 (-0.22)		0.383 (0.57)	0.034 (0.05)	0.423 (0.61)	0.114 (0.19)
All control variables included											
Fixed effects: Year											
F / Wald Chi ² - Statistics	13.73	19.01	13.18	14.89	14.71	9190.01	12436.27	10755.53	13311.72	8121.20	
N	601	601	601	601	601	536	536	536	536	536	
Adj. / Pseudo R ²	21.1%	23.0%	21.5%	21.9%	21.7%	28.4%	31.5%	29.9%	31.8%	29.2%	
Test for difference: <i>Post_IFRS_{HD}</i> = <i>Post_IFRS_{LD}</i>											
[p-value]		[0.00]	[0.10]	[0.02]	[0.06]		[0.00]	[0.04]	[0.00]	[0.17]	
F / Chi ² - Statistics		16.07	2.81	5.44	3.66		10.92	4.45	9.15	1.92	

(Continued)

Table 5-2 – Continued

Panel D: Exclude countries with observations no more than five										
	OLS: Log (1 + Num_Acov)					Probit: D_ACov				
	DID	(1)	(2)	(3)	(4)	DID	(1)	(2)	(3)	(4)
<i>IFRS</i>	0.019 (0.38)	0.014 (0.27)	0.014 (0.28)	0.013 (0.26)	0.019 (0.39)	0.219 (0.64)	0.141 (0.41)	0.160 (0.46)	0.136 (0.39)	0.211 (0.62)
<i>Post_IFRS</i>	-0.203** (-2.66)					-0.676* (-1.65)				
<i>Post_IFRS_{HD}</i>		-0.530*** (-4.91)	-0.350*** (-2.74)	-0.377*** (-2.97)	-0.279*** (-3.02)		-1.453*** (-3.07)	-1.163*** (-2.79)	-1.274*** (-3.00)	-0.901* (-1.88)
<i>Post_IFRS_{LD}</i>		-0.049 (-0.73)	-0.100 (-1.33)	-0.074 (-1.09)	-0.061 (-0.65)		0.320 (0.52)	-0.060 (-0.11)	0.333 (0.52)	-0.008 (-0.01)
All control variables included										
Fixed effects: Year										
F / Wald Chi ² - Statistics	25.33	25.92	23.04	22.67	25.50	2448.04	2121.50	2625.15	2694.48	1764.89
N	1,452	1,452	1,452	1,452	1,452	1,452	1,452	1,452	1,452	1,452
Adj. / Pseudo R ²	24.3%	25.8%	24.6%	24.9%	24.5%	35.5%	38.6%	36.9%	38.0%	36.2%
Test for difference: <i>Post_IFRS_{HD}</i> = <i>Post_IFRS_{LD}</i>										
[p-value]		[0.00]	[0.05]	[0.01]	[0.08]		[0.00]	[0.01]	[0.00]	[0.18]
F / Chi ² - Statistics		25.76	3.87	6.91	3.29		16.93	6.54	12.16	1.77
Panel E: Include all U.S. observations										
	OLS: Log (1 + Num_Acov)					Probit: D_ACov				
	DID	(1)	(2)	(3)	(4)	DID	(1)	(2)	(3)	(4)
<i>IFRS</i>	-0.162*** (-2.76)	-0.163*** (-2.78)	-0.163*** (-2.77)	-0.164*** (-2.78)	-0.162*** (-2.77)	-0.401 (-1.31)	-0.413 (-1.35)	-0.410 (-1.34)	-0.417 (-1.36)	-0.402 (-1.32)
<i>Post_IFRS</i>	-0.085 (-1.35)					-0.588** (-1.97)				
<i>Post_IFRS_{HD}</i>		-0.321*** (-3.30)	-0.214** (-2.10)	-0.248** (-2.26)	-0.142* (-1.72)		-1.146*** (-3.34)	-0.942*** (-2.85)	-1.043*** (-3.07)	-0.809** (-2.41)
<i>Post_IFRS_{LD}</i>		0.059 (1.02)	0.020 (0.30)	0.040 (0.70)	0.023 (0.33)		0.438 (0.83)	0.036 (0.08)	0.411 (0.76)	0.177 (0.32)

(Continued)

Table 5-2 – Continued

All control variables included										
Fixed effects: Year										
F / Wald Chi ² - Statistics	54.61	58.94	59.11	54.83	58.06	986.35	1051.43	1076.24	1051.40	1171.41
N	11,294	11,294	11,294	11,294	11,294	11,294	11,294	11,294	11,294	11,294
Adj. / Pseudo R ²	20.1%	20.2%	20.1%	20.2%	20.1%	14.8%	15.2%	15.0%	15.1%	14.9%
Test for difference: $Post_IFRS_{HD} = Post_IFRS_{LD}$										
[p-value]	[0.00]	[0.05]	[0.02]	[0.12]		[0.00]	[0.02]	[0.00]	[0.11]	
F / Chi ² - Statistics	13.54	4.10	6.17	2.55		15.71	5.41	13.90	2.58	

Table 5-2 shows different robustness tests. DID refers to difference-in-difference analysis for accounting covenants use, which is consistent with Table 4-4. Columns (1) – (4) are consistent with Columns (1) – (4) in Table 4-6. *IFRS* equals one for observations from an IFRS adoption country during the sample period, and zero otherwise. *Post_IFRS* equals one for observations from IFRS countries in the post-adoption period, and zero otherwise. *Post_IFRS_{HD}* (*Post_IFRS_{LD}*) equals one for observations from HighDiff (LowDiff) countries in the post-adoption period, and zero otherwise. This table shows regression coefficients for the OLS model and the Probit model, and t- or z-statistics (in parentheses) based on standard errors clustered by industry (two-digit SIC). Year fixed effects and all control variables are included. This table also shows p-values of an F-test or χ^2 test derived from testing the null hypothesis of whether $Post_IFRS_{HD} = Post_IFRS_{LD}$ while clustering standard errors by industry. All continuous variables are winsorised at the 1st and 99th percentiles. The coefficients of test variables are highlighted in bold. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

Furthermore, almost all results are consistent with the conclusions drawn for the HighDiff and LowDiff countries. Coefficients on $Post_IFRS_{HD}$ in all classifications are negative and significant, while in LowDiff countries, all the coefficients are insignificant. By using an F-test (χ^2 test), the null hypothesis that $Post_IFRS_{HD} = Post_IFRS_{LD}$ is rejected in almost all specifications, which is consistent with H2.

5.3 Robustness Analyses with Different Fixed Effects and Clusters

In the main regression models, I use year fixed effects and standard errors clustered by industry. In this section, I include different fixed effects and clusters.⁵⁴

Panel A of Table 5-3 shows the results for the OLS model and the coefficients on $Post_IFRS$ are negative for all combinations of fixed effects and clusters. Except for year and country fixed effects with standard errors clustered by industry, all the other coefficients on $Post_IFRS$ are significant. These results are consistent with H1 and Section 4.3 (Table 4-4). From Panel B of Table 5-3, all the coefficients on $Post_IFRS$ in the Probit model are negative and significant under all combinations of fixed effects and clusters. These robustness results also provide evidence to support H1.

Consequently, Table 5-3 suggests that the conclusion drawn from Section 4.3 that the use of accounting covenants decreases after IFRS adoption is not affected by using different fixed effects and clusters.

⁵⁴ For the Probit model, I analyse the impact of having no fixed effects and also of having year fixed effects but no other fixed effects. This is because in statistics references, fixed effects are not recommended to use in the Probit model.

Table 5-3
Robustness Analyses with Different Fixed Effects and Clusters

Panel A: Different fixed effects and clusters in the OLS model								
OLS: Log (1 + Num_Acov)								
Cluster by	Year; Country; Industry	Country; Industry	Year; Industry	Year; Country	Industry	Year	Country	N/A
Post_IFRS	-0.167** (-2.43)	-0.171** (-2.42)	-0.129* (-1.78)	-0.184*** (-2.64)	-0.095 (-1.52)	-0.151* (-2.20)	-0.190*** (-2.82)	-0.110** (-2.11)
All control variables included								
Fixed effects	N/A	Year	Country	Industry	Year; Country	Country; Industry	Year; Industry	Year; Country; Industry
N	1,489	1,489	1,489	1,489	1,489	1,489	1,489	1,489
Adj. R ²	23.8%	24.3%	28.3%	28.6%	29.0%	33.0%	29.0%	33.7%
Panel B: Different clusters or no fixed effects in the Probit model								
Probit: D_Acov								
Cluster by	N/A	Country; Industry	Year; Industry	Year; Country	Year; Country; Industry	Country	Country; Industry	
Post_IFRS	-0.567** (-2.21)	-0.567** (-2.12)	-0.567** (-2.12)	-0.567** (-2.04)	-0.567** (-2.04)	-0.514** (-2.15)	-0.514* (-1.67)	
All control variables included								
Fixed effects	N/A	N/A	N/A	N/A	N/A	Year	Year	
N	1,489	1,489	1,489	1,489	1,489	1,489	1,489	
Pseudo R ²	32.2%	32.2%	32.2%	32.2%	32.2%	34.8%	34.8%	

Table 5-3 shows the results for different fixed effects and clusters. *Post_IFRS* equals one for observations from IFRS countries in the post-adoption period, and zero otherwise. All control variables are included. All continuous variables are winsorised at the 1st and 99th percentiles. The coefficients of the test variable are highlighted in bold. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

5.4 The Impact of the Global Financial Crisis

During the global financial crisis, the circumstances surrounding the issuance of debt may have been different. Specifically, the uses of accounting covenants in the debt issuance process during the global financial crisis might have differed. Therefore, I evaluate whether the conclusions drawn from Section 4.3 are affected by the financial crisis.

In Panel A of Table 5-4, I exclude the debt that is issued in 2008 and 2009. The coefficients on *Post_IFRS* in both the OLS and Probit models are negative and significant -0.188 / -0.842 (t-statistic = -2.01 / -1.82), indicating that the global financial crisis had little effect on debt covenants use.

I also classify IFRS countries in the post-adoption period into two groups: *Post_IFRS_{GFC}* and *Post_IFRS_{NGFC}*. *Post_IFRS_{GFC}* equals one for observations from IFRS countries in the years 2008 and 2009 of the post-adoption period, and zero otherwise. *Post_IFRS_{NGFC}* equals one for observations from IFRS countries in the post-adoption period without the years 2008 and 2009, and zero otherwise.

In Panel B of Table 5-4, the coefficients on both *Post_IFRS_{GFC}* and *Post_IFRS_{NGFC}* in the OLS model are negative and significant -0.189 / -0.177 (t-statistic = -1.88 / -2.00), indicating that there are no significant differences between global financial crisis period and other periods in the post-adoption era. I also find in the Probit model that the coefficient on *Post_IFRS_{GFC}* is negative and insignificant (t-statistic = -0.83). The possible reason is that the time period of the global financial

crisis is too short and hence only a very small number of debt issues occurred during these two years.

Table 5-4

Robustness Analyses of the Global Financial Crisis

Panel A: Exclude 2008 and 2009		
	OLS: Log (1 + Num_Acov)	Probit: D_Acov
<i>IFRS</i>	0.022 (0.39)	0.262 (0.79)
<i>Post_IFRS</i>	-0.188** (-2.01)	-0.842* (-1.82)
All control variables included		
Fixed effects: Year		
F / Wald Chi ² - Statistics	20.66	3004.09
N	1,143	1,143
Adj. / Pseudo R ²	22.5%	36.2%
Panel B: Divide <i>Post_IFRS</i> into two groups		
	OLS: Log (1 + Num_Acov)	Probit: D_Acov
<i>IFRS</i>	0.013 (0.26)	0.309 (0.95)
<i>Post_IFRS_{GFC}</i>	-0.189* (-1.88)	-0.520 (-0.83)
<i>Post_IFRS_{NGFC}</i>	-0.177* (-2.00)	-0.822* (-1.93)
All control variables included		
Fixed effects: Year		
F / Wald Chi ² - Statistics	30.32	3755.26
N	1,489	1,489
Adj. / Pseudo R ²	24.2%	35.2%

Table 5-4 shows the effects of the global financial crisis on accounting covenants use. *IFRS* equals one for observations from an IFRS adoption country during the sample period, and zero otherwise. *Post_IFRS* equals one for observations from an IFRS country in the post-adoption period, and zero otherwise. In Panel B, IFRS countries identified with a post-adoption period are classified into "*Post_IFRS_{GFC}*" and "*Post_IFRS_{NGFC}*" groups. *Post_IFRS_{GFC}* equals one for observations from IFRS countries in the years 2008 and 2009 of the post-adoption period, and zero otherwise. *Post_IFRS_{NGFC}* equals one for observations taken from IFRS countries in the post-adoption period excluding years 2008 or 2009, and zero otherwise. Year fixed effects and all control variables are included. Standard errors are clustered by industry (two-digit SIC). All continuous variables are winsorised at the 1st and 99th percentiles. The coefficients of test variables are highlighted in bold. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

As a result, it is difficult to find a difference between this period (i.e., financial crisis period) and other periods. On the other hand, the results may also support the

view that the decreased use of accounting covenants use is the result of IFRS adoption, rather than the global financial crisis.⁵⁵

5.5 Income Statement-Based Covenants and Balance Sheet-Based Covenants

In this section, I examine the impact of IFRS on income statement-based covenants and balance sheet-based covenants. The results are reported in Table 5-5.

The coefficients on *Post_IFRS* of income statement in both the OLS and Probit models are negative and insignificant -0.065 / -0.360 (t-statistic = -1.21 / -1.20). These results are consistent with prior studies (Demerjian 2011; Christensen and Nikolaev 2012) which show that fair value has fewer effects on the income statement, and thus the change in income statement (performance) covenants use in the post-adoption period should be immaterial.

For the balance sheet covenants, the coefficient in the OLS model is negative and significant -0.122 (t-statistic = -2.23). This result is also consistent with the view that fair value accounting has more effects on balance sheets. Therefore, the use of balance sheet (capital) covenants decreases after IFRS adoption. The presence of balance sheet covenants usage has an insignificant result (t-statistic = -0.30), but this may result from the small number of observations for balance sheet covenants.⁵⁶

⁵⁵ If the decreased use of accounting covenants results from the global financial crisis, the coefficient on *Post_IFRS_{NGFC}* should be insignificant, meanwhile, the coefficient on *Post_IFRS_{GFC}* should be negative and significant. However, from Panel B of Table 5-4, the coefficients on *Post_IFRS_{NGFC}* in both models are significant, and the coefficient on *Post_IFRS_{GFC}* in the Probit model is insignificant.

⁵⁶ As the Probit model includes only 0 and 1, unlike the OLS model which has a large range, the small number can have a significant effect on the Probit model but not on the OLS model.

Table 5-5

Income Statement-Based Covenants and Balance Sheet-Based Covenants

	OLS:		Probit:	
	Log (1 + <i>Num_ACov_IS</i>)	Log (1 + <i>Num_ACov_BS</i>)	<i>D_ACov_IS</i>	<i>D_ACov_BS</i>
<i>IFRS</i>	0.005 (0.14)	-0.021 (-0.59)	0.143 (0.51)	-0.223 (-1.59)
<i>Post_IFRS</i>	-0.065 (-1.21)	-0.122** (-2.23)	-0.360 (-1.20)	-0.065 (-0.30)
All control variables included				
Fixed effects: Year				
F / Wald Chi ² - Statistics	38.73	76.73	446.38	706.40
N	1,489	1,489	1,489	1,489
Adj. / Pseudo R ²	39.7%	57.0%	14.7%	36.0%

Table 5-5 shows the results of income statement covenants and balance sheet covenants use. I use an OLS model for regressions on the natural logarithm of 1 + *Num_ACov_IS* (*Num_ACov_BS*). *Num_ACov_IS* (*Num_ACov_BS*) is the number of income statement (balance sheet)-based covenants per observation (facility). I use a Probit model for regressions on the binary variable *D_ACov_IS* (*D_ACov_BS*). *D_ACov_IS* (*D_ACov_BS*) is a dummy variable, it equals one if the debt contract contains at least one income statement (balance sheet)-based debt covenant, and zero otherwise. *IFRS* equals one for observations from IFRS adoption countries during the sample period, and zero otherwise. *Post_IFRS* equals one for observations taken from IFRS countries in the post-adoption period, and zero otherwise. Year fixed effects and all control variables are included. Standard errors are clustered by industry (two-digit SIC). All continuous variables are winsorised at the 1st and 99th percentiles. The coefficients and the t-value of the test variable are highlighted in bold. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

5.6 The Impact of IFRS Adoption Announcements

In this section, I examine whether the announcement of IFRS adoption can result in changes in the use of accounting covenants. Borrowers and lenders will factor in the anticipated changes due to IFRS adoption after an announcement has been made but before the actual adoption. The effects of the announcement of IFRS adoption are unclear because there exist two opposing scenarios. During the period leading up to the actual IFRS adoption date, local GAAP were still being used by firms. As IFRS could result in uncertainty surrounding accounting numbers, lenders may prefer to use more accounting covenants prior to the IFRS adoption date

because this enables them to make a greater use of the benefits of local GAAP in a reduced amount of time. On the other hand, in most cases the actual adoption of IFRS is about two to three years later than the announcement date and lenders may have already perceived higher risks associated with the adoption of IFRS and, as a result, there is a reduced use of accounting covenants before the actual adoption of IFRS. Therefore, the impact of changes in accounting covenants use after the announcement of impending IFRS adoption is unclear.

I obtain the announcement dates of IFRS by country from Daske, Hail, Leuz and Verdi (2008) and add one variable *Post_Announ*. *Post_Announ* equals one for observations (loan facilities) issued in IFRS countries in fiscal years ending after the announcement date but before IFRS adoption, and zero otherwise.⁵⁷ *Post_Announ_{HD}* (*Post_Announ_{LD}*) equals one for observations (loan facilities) issued in HighDiff (LowDiff) countries in fiscal years ending after the announcement date but before IFRS adoption, and zero otherwise.

From Table 5-6, the coefficient on *Post_Announ* in DID test of the OLS model is positive and insignificant 0.072 (t-statistic = 1.54).⁵⁸ The positive results are partly consistent with the first argument that lenders may worry about the uncertainty of IFRS adoption after 2005 and hence use more accounting covenants after the IFRS announcement date. However, as the results are insignificant, the conclusion regarding the effects of IFRS announcements is still unclear.

⁵⁷ The details of announcement dates are provided in Appendix 4.

⁵⁸ I do not use *D_Acov* as the absence of accounting covenants in the pre-adoption period is rare, which means that the results from *D_Acov* are less useful in this condition.

Table 5-6

The Impact of IFRS Adoption Announcements

		OLS: Log (1 + Num_Acov)			
	DID	(1)	(2)	(3)	(4)
<i>Post_Announ</i>	0.072 (1.54)				
<i>Post_Announ_{HD}</i>		0.057 (0.59)	0.013 (0.16)	0.059 (0.75)	0.088 (1.38)
<i>Post_Announ_{LD}</i>		0.079 (1.51)	0.099* (1.78)	0.079 (1.41)	0.055 (0.82)
<i>Post_IFRS</i>	-0.155** (-2.26)	-0.155** (-2.27)	-0.155** (-2.27)	-0.155** (-2.27)	-0.154** (-2.27)
All control variables included					
Fixed effects: Year					
F-statistics	33.24	32.38	31.52	32.11	33.51
N	1,489	1,489	1,489	1,489	1,489
Adj. R ²	24.5%	24.4%	24.5%	24.4%	24.4%
Test for difference: <i>Post_IFRS_{HD}</i> = <i>Post_IFRS_{LD}</i>					
[p-value]		[0.84]	[0.38]	[0.84]	[0.71]
F - Statistics		0.04	0.79	0.04	0.14

Table 5-6 shows the effects of IFRS announcements on the use of accounting covenants. *Post_Announ* equals one for observations (loan facilities) issued in IFRS countries in fiscal years ending after the announcement date but before IFRS adoption, and zero otherwise. *Post_Announ_{HD}* (*Post_Announ_{LD}*) equals one for observations (loan facilities) issued in HighDiff (LowDiff) countries in fiscal years ending after the announcement date but before IFRS adoption, and zero otherwise. *Post_IFRS* equals one for observations from the IFRS countries and in the post-adoption period, and zero otherwise. This table also shows p-values of an F-test from testing the null hypothesis of whether *Post_Announ_{HD}* = *Post_Announ_{LD}* and clustering standard errors by industry. Year fixed effects and all control variables are included. All continuous variables are winsorised at the 1st and 99th percentiles. The coefficients and t-values of the test variable are highlighted in bold. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

In addition, following Section 4.4, I also classify *Post_Announ* into HighDiff and LowDiff groups. The coefficients on both *Post_Announ_{HD}* and *Post_Announ_{LD}* in four classifications are generally insignificant.⁵⁹ By using F-test, the null hypothesis of whether $Post_Announ_{HD} = Post_Announ_{LD}$ is accepted in all specifications, indicating that no material difference exists between HighDiff countries and LowDiff countries during the period after IFRS announcement but before IFRS adoption.

From the above discussion, the effects of IFRS announcement on the use of accounting covenants use are still unclear. However, these results suggest that the decreased use of accounting covenants should be attributed to actual IFRS adoption rather than IFRS adoption announcements. And the effects of differences between local GAAP and IFRS may only have an impact after IFRS is actually adopted by these IFRS countries.

5.7 Including Data with No Covenant Information

In the main analysis, the observations without covenants information are excluded as covenant-free debts are rare in reality and a zero covenant is likely to be caused by a failure by data vendors to collect this information. In this section, I use all data including data without covenant information (covenant-free data). Table 5-7 shows the results.

⁵⁹ Except for the coefficient on *Post_Announ_{LD}* in the second classification which is slightly significant at the 10% level.

Both coefficients on *Post_IFRS* are negative and significant -0.201 / -0.652 (t-statistic = -3.48 / -4.58), indicating the conclusion in Section 4.3 holds when including all covenant-free debt issues.⁶⁰

Table 5-7
Robustness Analyses of Covenant-Free Observations

	OLS: Log (1 + Num_Acov)	Probit: D_ACov
<i>IFRS</i>	-0.023 (-0.84)	-0.175 (-1.49)
<i>Post_IFRS</i>	-0.201*** (-3.48)	-0.652*** (-4.58)
All debt control variables included		
Fixed effects: Year		
F / Wald Chi ² - Statistics	36.68	1618.84
N	22,216	22,216
Adj. / Pseudo R ²	19.4%	22.6%

Table 5-7 shows the results for all observations including covenant-free data. *IFRS* equals one for observations from IFRS adoption countries during the sample period, and zero otherwise. *Post_IFRS* equals one for observations from the IFRS countries in the post-adoption period, and zero otherwise. Standard errors are clustered by industry (two-digit SIC). All continuous variables are winsorised at the 1st and 99th percentiles. The coefficients and the t-value of the test variable are highlighted in bold. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

5.8 Propensity-Score-Matching

IFRS adoption countries may have their own endogenous factors to adopt IFRS. Therefore, to control for these endogenous issues, I use a propensity-score-matched sample to repeat the analyses in Table 4-4 and Table 4-6.⁶¹ To create the propensity-score-matched sample, I first run the OLS regression model by using all

⁶⁰ I exclude the U.S. observations here because, in DealScan, the covenant coverage in the U.S. is substantially better than it is in non-U.S. countries.

⁶¹ The number of observations decreases significantly for the matched group, I only repeat the OLS model number of accounting covenants analysis and I do not adopt the Probit model for the presence of accounting covenants. This is because accounting covenants are generally present in all debt issues and when the number of observations is small, the results for the Probit model may not be accurate.

control variables. I then match observations in IFRS countries with those in non-IFRS countries using “without replacement” with a radius of 0.01.⁶²

From Table 5-8, the coefficient on *Post_IFRS* in the DID test is negative and significant -0.166 (t-statistic = -1.77), indicating that the conclusion drawn from Section 4.3 still holds after using a propensity-score-matched control sample.

When considering the differences between local GAAP and IFRS, the results also remain unchanged. The coefficients on *Post_IFRS_{HD}* are negative and significant -0.469 / -0.294 / -0.302 / -0.261 (t-statistic = -3.67 / -2.50 / -2.53 / -2.47), while the coefficients on *Post_IFRS_{LD}* are negative but insignificant. By using an F-test, the null hypothesis that *Post_IFRS_{HD}* = *Post_IFRS_{LD}* is rejected in all classifications, indicating that a significant difference exists between HighDiff countries and LowDiff countries after IFRS adoption. These results are consistent with H2 and the conclusion drawn from Section 4.4 that HighDiff could be one important reason which explains the decreased use of accounting covenants in the post-adoption period.

⁶² According to Table 4-3, some control variables (e.g., *Log (Debt Size)*, *Maturity*, *Size*, etc) show significant differences between IFRS countries and non-IFRS countries, and these differences may affect my results. For example, a longer maturity period may result in more accounting covenants use. Therefore, I use a propensity-score-matched sample to eliminate this issue because the values of control variables are similar under this sample.

Table 5-8

Propensity-Score-Matching

	DID	OLS: Log (1 + Num_Acov)			
		(1)	(2)	(3)	(4)
<i>Post_IFRS</i>	-0.166* (-1.77)				
<i>Post_IFRS_{HD}</i>		-0.469*** (-3.67)	-0.294** (-2.50)	-0.302** (-2.53)	-0.261** (-2.47)
<i>Post_IFRS_{LD}</i>		-0.040 (-0.41)	-0.082 (-0.78)	-0.084 (-0.81)	-0.043 (-0.38)
All control variables included					
F-statistics	5.27	5.77	5.19	5.20	5.23
N	340	340	340	340	340
Adj. R ²	24.5%	21.1%	19.0%	19.1%	19.1%
Test for difference: <i>Post_IFRS_{HD}</i> = <i>Post_IFRS_{LD}</i>					
[p-value]		[0.00]	[0.07]	[0.07]	[0.06]
F - Statistics		11.74	3.22	3.34	3.68

Table 5-8 shows the results for the propensity-score-matched sample. To create the propensity-score-matched sample, I first run the OLS regression model by using all control variables. I match observations in IFRS countries with those in non-IFRS countries using “without replacement” with a radius of 0.01. The final matched group had 340 observations. DID refers to difference-in-difference analysis for accounting covenants use, which is consistent with Table 4-4. Columns (1) – (4) are consistent with Columns (1) – (4) in Table 4-6. *Post_IFRS* equals one for observations from the IFRS countries in the post-adoption period, and zero otherwise. *Post_IFRS_{HD}* (*Post_IFRS_{LD}*) equals one for observations from HighDiff (LowDiff) countries in the post-adoption period, and zero otherwise. This table also shows p-values of an F-test from testing the null hypothesis of whether *Post_IFRS_{HD}* = *Post_IFRS_{LD}* and clustering standard errors by industry. All control variables are included. All continuous variables are winsorised at the 1st and 99th percentiles. The coefficients and t-values of the test variable are highlighted in bold. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

5.9 Robustness Analyses with *Num_ACov*

In this section, I examine whether the results change if the dependent variable changes from $\text{Log}(1 + \text{Num_Acov})$ to *Num_ACov*. I use the Poisson model as *Num_ACov* is an integer variable. Results are reported in Table 5-9.

The coefficient on *Post_IFRS* of the Poisson model is negative and significant -0.206 (t-statistic = -2.00), indicating that the conclusion drawn from Section 4.3 still holds after using *Num_ACov* as the dependent variable.

Columns (1) – (4) examine the effects of differences between local GAAP and IFRS. The coefficients on *Post_IFRS_{HD}* are negative and significant -0.582 / -0.374 / -0.421 / -0.269 (t-statistic = -3.22 / -2.45 / -2.65 / -2.19), while the coefficients on *Post_IFRS_{LD}* are negative and insignificant.⁶³ These results indicate that a significant difference exists between HighDiff countries and LowDiff countries after IFRS adoption. These results are consistent with H2 and the conclusion drawn in Section 4.4 that HighDiff could be an important reason that explains the decreased use of accounting covenants in the post-adoption period.

⁶³ When using χ^2 -test, I find that the null hypothesis that *Post_IFRS_{HD}* = *Post_IFRS_{LD}* is not rejected in all classifications. But as the coefficients on *Post_IFRS_{HD}* and *Post_IFRS_{LD}* generally show similar results to those in Section 4.4, my conclusions are not affected.

Table 5-9

Robustness Analyses with Num_ACov

	DID	Poisson: Num_ACov			
		(1)	(2)	(3)	(4)
<i>IFRS</i>	0.005 (0.08)	0.001 (0.02)	0.001 (0.02)	0.001 (0.01)	0.005 (0.08)
<i>Post_IFRS</i>	-0.206** (-2.00)				
<i>Post_IFRS_{HD}</i>		-0.582*** (-3.22)	-0.374** (-2.45)	-0.421*** (-2.65)	-0.269** (-2.19)
<i>Post_IFRS_{LD}</i>		-0.056 (-0.50)	-0.101 (-0.84)	-0.084 (-0.71)	-0.101 (-0.69)
All control variables included					
LR Chi ² / Wald Chi ² - Statistics	189.00	196.94	191.51	192.68	189.97
<i>N</i>	1,489	1,489	1,489	1,489	1,489
Pseudo <i>R</i> ²	3.7%	3.9%	3.8%	3.8%	3.8%
Test for difference: <i>Post_IFRS_{HD}</i> = <i>Post_IFRS_{LD}</i>					
[p-value]		[0.01]	[0.12]	[0.06]	[0.26]
Chi ² - Statistics		7.30	2.45	3.55	1.24

Table 5-9 shows the results for the robustness analyses with Num_ACov. DID refers to difference-in-difference analysis for accounting covenants use, which is consistent with Table 4-4. Columns (1) – (4) are consistent with Columns (1) – (4) in Table 4-6. *IFRS* equals one for observations from an IFRS adoption country during the sample period, and zero otherwise. *Post_IFRS* equals one for observations from IFRS countries in the post-adoption period, and zero otherwise. *Post_IFRS_{HD}* (*Post_IFRS_{LD}*) equals one for observations from HighDiff (LowDiff) countries in the post-adoption period, and zero otherwise. This table shows regression coefficients for the Poisson model and z-statistics (in parentheses) based on standard errors clustered by industry (two-digit SIC). All control variables are included. This table also shows p-values of a χ^2 test derived from testing the null hypothesis of whether *Post_IFRS_{HD}* = *Post_IFRS_{LD}* while clustering standard errors by industry. All continuous variables are winsorised at the 1st and 99th percentiles. The coefficients of test variables are highlighted in bold. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

CHAPTER 6 CONCLUSION

Compared to the prior domestic local GAAP, IFRS have a variety of attributes that could compromise the external debt contracting usefulness of financial statements. Following Chen et al. (2015), Ball et al. (2015) and Brown (2016), I predict a consequential decline in the use of accounting debt covenants after mandatory IFRS adoption. My thesis confirms the predicted results, namely, that there is a decline in the number of debt contracts issued by firms in countries that have mandated IFRS adoption, but not in non-IFRS countries. In addition, in accordance with the prior literature, I examine the use of accounting debt covenants after IFRS adoption. This analysis utilises four different classification criteria and I find that the decline in accounting covenants use is more pronounced in HighDiff countries than in LowDiff countries. This is consistent with my hypothesis that HighDiff could be the main reason that results in the uncertainty of accounting ratios and hence reduces contractibility. Moreover, the significant decrease of accounting covenants use can only be found in strong enforcement countries with HighDiff, indicating that IFRS practice is different across all countries, and the results also suggest that only in countries that effectively adopt IFRS (have high enforcement), can the effects of IFRS be found. Furthermore, I find that the use of non-accounting covenants increases after IFRS adoption, indicating that the change in accounting covenants use should be attributed to the reduction of contractibility rather than to an increase in transparency.

This study provides evidence complementary to the view that the change in accounting covenants use results from decreased contractibility rather than from

increased transparency. Generally, this study contributes to the literature that focuses on the use of accounting information in debt contracting. In addition, this thesis also provides some new evidence regarding changes in contractibility brought about by changes in non-accounting covenants. The increased use of non-accounting covenants supports the view that the decreased use of accounting covenants cannot be caused by increased transparency, because the latter would decrease the use of both accounting and non-accounting covenants.

The results suggest that financial statements prepared under IFRS have important limitations for debt contracting. In addition, this thesis also suggests that regulators should conduct a more comprehensive investigation before making new policies. According to Singleton-Green (2015) and George et al. (2016), IFRS seems to bring many benefits for equity markets (e.g., improved transparency and comparability), but not for debt markets. Because of the importance of debt markets, regulators should also fully consider how IFRS impacts the mechanism of debt markets and facilitate the use of IFRS in that setting.

Although debt markets are as important as, indeed even more important than, equity markets, few studies investigate the effects of IFRS on debt markets and research in this area is nascent.⁶⁴ However, the results regarding the effects of IFRS on equity markets cannot be directly extended to debt markets because shareholders and debtholders have different information requirements. Shareholders may be concerned about the market value of borrowers, whereas

⁶⁴ The total amount of debts in the EU was 1.93 (compared with GDP), which is about three times the size of its equity market (0.59) from 2000 to 2011.

debtholders may also care about the liquidation and solvency of borrowers. Therefore, it is vital to explore the uniqueness of debt markets and examine the relationships between IFRS and debt markets.

Due to the lack of comprehensive and detailed debt contract data, especially in non-U.S. countries, there are many difficulties and obstacles to international debt research. For example, I find that less than 10% of debt issues in DealScan contain one covenant. In reality, covenant-free debts are rare, which means that the situation of zero covenant is likely caused by a failure by the data vendors to collect this information. In addition, language barriers are another obstacle for researchers who seek to collect detailed debt information.

Notwithstanding the above difficulties, it remains critically important to investigate debt markets due to their large size and unique characteristics.

Future research is essential. First, future research can investigate the effects of IFRS on debt covenants violation. As the adoption of IFRS brings uncertainty and volatility to accounting ratios, covenant violations may increase after IFRS adoption as accounting numbers keep changing over time, which makes accounting ratios more likely to exceed or fall below the threshold.

Second, future research can also investigate whether, and if so how, public bond issuances and private loan issuances differ after the adoption of IFRS. As discussed in Chapter 1, this thesis only investigates the effects of IFRS on private debt contracts, due to the limited data availability on debt contracts in my University.

Finally, as contractibility is unobservable, my conclusions can only be based on archival empirical results. Future studies can also interview lenders and borrowers, and this could be one effective method to investigate the specific and actual impact of IFRS on debt contracts, and the real perceptions of borrowers and lenders of IFRS adoption.

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APPENDICES

Appendix 1: Criteria for Classifying Differences Between IFRS and Local GAAP

As discussed in Section 4.4, I use four classifications to categorise IFRS countries as “high difference between IFRS and local GAAP” (HighDiff) and “low difference between IFRS and local GAAP” (LowDiff). I follow Nobes (2001), Street (2002), Ding et al. (2007) and Bae et al. (2008) and use the sample medians of each of the measurements as the classification criteria to categorise HighDiff and LowDiff countries. There are six classifications at first, but three of them have the same countries in HighDiff and LowDiff groups, and thus the total types of classification are four. The first classification result is based on the Bae Index from Bae et al. (2008). The second classification result comes from three measurements (but these three measurements have the same classification of HighDiff and LowDiff countries), namely the Nobes Index in Nobes (2001) and Street (2002), the *Absence* index in Ding et al. (2007), and the Total (Total *Absence* and *Divergence*) Index in Ding et al. (2007). The third classification result is also based on the Nobes Index in Street (2002), but the difference between this classification and the second classification using the Nobes Index result is that two same-index countries, namely, the Philippines and Sweden, both have the same indices which are equal to the median number.⁶⁵ The fourth classification result is based on the *Divergence* Index in Ding et al. (2007). The details of the index numbers are as follows:

⁶⁵ In the second classification, I classify Philippines as HighDiff country and Sweden as LowDiff country, while in the third classification, I classify Sweden as HighDiff country and Philippines as LowDiff country.

Table A-1

Detailed Indices in Different Classifications

Panel A: Bae Index from Bae et al. (2008)			
HighDiff		LowDiff	
Country	Index	Country	Index
Finland	15	Australia	4
France	12	Hong Kong	3
Germany	11	Ireland	1
Italy	12	Netherlands	4
Luxembourg	18	New Zealand	3
Philippines	10	Norway	7
Spain	16	Singapore	0
Sweden	10	South Africa	0
Switzerland	12	United Kingdom	1
Median	8.5		
Panel B: Nobes Index from Nobes (2001) and Street (2002) – Philippines is classified as HighDiff country			
HighDiff		LowDiff	
Country	Index	Country	Index
Australia	28	Hong Kong	18
Finland	40	Ireland	20
France	40	Netherlands	22
Germany	40	New Zealand	23
Italy	35	Norway	19
Luxembourg	37	Singapore	14
Philippines	25	South Africa	5
Spain	40	Sweden	25
Switzerland	43	United Kingdom	21
Median	25		

(Continued)

Table A-1 – *Continued*

Panel C: Nobes Index from Nobes (2001) and Street (2002)			
– Sweden is classified as HighDiff country			
HighDiff		LowDiff	
Country	Index	Country	Index
Australia	28	Hong Kong	18
Finland	40	Ireland	20
France	40	Netherlands	22
Germany	40	New Zealand	23
Italy	35	Norway	19
Luxembourg	37	Philippines	25
Spain	40	Singapore	14
Sweden	25	South Africa	5
Switzerland	43	United Kingdom	21
Median	25		
Panel D: Absence Index only from Ding et al. (2007)			
HighDiff		LowDiff	
Country	Index	Country	Index
Australia	22	Hong Kong	14
Finland	22	Ireland	0
France	21	Netherlands	10
Germany	18	New Zealand	-
Italy	27	Norway	7
Luxembourg	-	Singapore	4
Philippines	24	South Africa	7
Spain	28	Sweden	10
Switzerland	-	United Kingdom	0
Median	16		

(Continued)

Table A-1 – Continued

Panel E: Divergence Index only from Ding et al. (2007)			
HighDiff		LowDiff	
Country	Index	Country	Index
Finland	31	Australia	21
France	34	Hong Kong	15
Germany	38	Netherlands	25
Ireland	34	New Zealand	-
Italy	37	Norway	17
Luxembourg	-	Philippines	14
Spain	29	Singapore	14
Switzerland	-	South Africa	1
United Kingdom	35	Sweden	26
Median	27.5		
Panel F: Total Absence and Divergence Indices only from Ding et al. (2007)			
HighDiff		LowDiff	
Country	Index	Country	Index
Australia	43	Hong Kong	29
Finland	53	Ireland	34
France	55	Netherlands	35
Germany	56	New Zealand	-
Italy	64	Norway	24
Luxembourg	-	Singapore	18
Philippines	38	South Africa	8
Spain	57	Sweden	36
Switzerland	-	United Kingdom	35
Median	37		

Table A-1 provides the indices for each classification and the median number. Panel B, Panel D and Panel F have the same country classification. Ding et al. (2008) do not provide the specific indices for Luxembourg, Switzerland or New Zealand. I use their measurements and follow Nobes (2001) (Ding et al. (2007) use Nobes (2001) survey results to develop the *Absence* and *Divergence* Indices) to classify Luxembourg and Switzerland into the HighDiff group. I also classify New Zealand into the LowDiff group.

Appendix 2: Classification of Enforcement Degree

Brown et al. (2014) provide indices of enforcement degree in three years - 2002, 2005 and 2008. In this thesis, I use their Total Enforcement Index as the measurement criterion to classify strong and weak enforcement countries. I choose the 2005 index because IFRS adoption in most IFRS countries is on or after fiscal year end 2005. The detailed index information is provided in Table A-2.

Table A-2

Detailed Indices for Enforcement Degree

StrongEnf			WeakEnf		
Country	Legal System	Index	Country	Legal System	Index
Australia	Common Law	52	Finland	Code Law	32
France	Code Law	48	Hong Kong	Common Law	30
Germany	Code Law	42	Ireland	Common Law	29
Italy	Code Law	43	Netherlands	Code Law	21
Norway	Code Law	47	Singapore	Common Law	32
Spain	Code Law	35	South Africa	Common Law	29
Switzerland	Code Law	46	Sweden	Code Law	30
United Kingdom	Common Law	54			
Median		35			

Table A-2 provides the index of enforcement degree and the median number. Higher numbers indicate better enforcement. Luxembourg is excluded as it is not included in the Brown et al. (2014). New Zealand and Singapore are excluded as the Total Enforcement Index is measured in 2005, which does not apply to New Zealand (2007) and Singapore (2003). Given that these three countries only have 2 observations in the post-adoption period (only 2.7% of the total observations from IFRS countries in the post-adoption period), the regression results and conclusions would not be affected.

Appendix 3: Detailed Information of the Bae Index

According to Bae et al. (2008), the differences in 21 accounting standards between local GAAP and IFRS (IAS) are the key changes from local to IFRS (IAS). The details are in the Table A-3. The number of differences in each country is shown in Table A-1 Panel A.

Table A-3:
21 Key Properties of the Bae Index

Item	Description	IFRS / IAS Rules
1	Do not require a primary statement of changes in equity	IAS 1.7
2	Do not generally require deferred tax accounting	IAS 12
3	Require no or very limited segment reporting	IAS 14
4	Require no or very limited capitalisation of leases	IAS 17
5	Do not have rules for accounting for employee benefit obligations (other than defined contribution plans in some cases),	IAS 19
6	Do not have rules for accounting for employee benefits other than pensions	IAS 19.52
7	Do not require disclosure of FIFO inventory cost when LIFO is used	IAS 2.36
8	Do not require impairment testing of goodwill or other intangibles with lives in excess of 20 years	IAS 22.56/38.99
9	Have no or very limited disclosure requirements for related-party transactions	IAS 24
10	Do not require that companies account for their financial instruments based on substance over form	IAS 32.18/.23

(Continued)

Table A-3 – Continued

11	Do not require the disclosure of the fair value of financial assets and liabilities	IAS 32.77
12	Do not have rules outlining the treatment of discontinued operations	IAS 35
13	Do not have rules calling for impairment testing for long-term assets, or impairments are only recorded when deemed permanent	IAS 36
14	Do not have specific rules dealing with provisions	IAS 37
15	Permit establishing provision when there is no obligation	IAS 37.14
16	Do not have rules calling for the discounting of provisions	IAS 37.45
17	Permit capitalisation of research and development costs	IAS38.42
18	Permit capitalisation of some other internally generated intangibles (e.g., brands)	IAS 38.51
19	Do not require a statement of cash flows	IAS 7
20	Permit a broader definition of extraordinary items	IAS 8.6
21	Do not require the consolidation of special purpose entities	SIC 12

Appendix 4: IFRS Announcement Dates

Following Daske et al. (2008), the dates of mandatory IFRS reporting announcement and actual IFRS adoption are shown in Table A-4.

Table A-4

IFRS Announcements and Adoption Dates

Country	Announcement Date	Adoption Date
Australia	04/07/2002	31/12/2005
Finland	04/06/2002	31/12/2005
France	04/06/2002	31/12/2005
Germany	04/06/2002	31/12/2005
Hong Kong	10/09/2004	31/12/2005
Ireland	04/06/2002	31/12/2005
Italy	04/06/2002	31/12/2005
Luxembourg	04/06/2002	31/12/2005
Netherlands	04/06/2002	31/12/2005
New Zealand	04/06/2002	31/12/2007
Norway	04/06/2002	31/12/2005
Philippines	02/10/2003	31/12/2005
Singapore	07/12/2000	31/12/2003
South Africa	20/05/2003	31/12/2005
Spain	04/06/2002	31/12/2005
Sweden	04/06/2002	31/12/2005
Switzerland	11/11/2002	31/12/2005
United Kingdom	04/06/2002	31/12/2005

Appendix 5: Definitions of Variables

Table A-5

Definitions of Variables

Variables	Definition
<i>Num_ACov</i>	The number of accounting-based debt covenants per debt contract.
<i>Num_ACov_IS</i>	The number of income statement-based debt covenants per debt contract.
<i>Num_ACov_BS</i>	The number of balance sheet-based debt covenants per debt contract.
<i>Num_NACov</i>	The number of non-accounting-based debt covenants per debt contract.
<i>D_ACov</i>	Equals one if the debt contract contains at least one accounting-based debt covenant, and zero otherwise.
<i>D_ACov_IS</i>	Equals one if the debt contract contains at least one income statement-based covenant, and zero otherwise.
<i>D_ACov_BS</i>	Equals one if the debt contract contains at least one balance sheet-based covenant, and zero otherwise.
<i>D_NACov</i>	Equals one if the debt contract contains at least one non-accounting-based debt covenant, and zero otherwise.
<i>Post</i>	Equals one for observations from the IFRS countries with fiscal year ends on or after mandatory adoption date, or for observations from non-IFRS countries with fiscal year ends on or after 31 st December 2005, and zero otherwise.
<i>IFRS</i>	Equals one for observations from IFRS adoption countries during the sample period, and zero otherwise.
<i>Post_IFRS</i>	Equals one for observations from the IFRS countries in the post-adoption period, and zero otherwise.
<i>Post_IFRS_{HD}</i>	Equals one for observations from HighDiff countries in the post-adoption period, and zero otherwise.
<i>Post_IFRS_{LD}</i>	Equals one for observations from LowDiff countries in the post-adoption period, and zero otherwise.
<i>Post_IFRS_{HDSE}</i>	Equals one for observations from HighDiff countries with a strong degree of enforcement in the post-adoption period, and zero otherwise.
<i>Post_IFRS_{HDWE}</i>	Equals one for observations from HighDiff countries with a weak degree of enforcement in the post-adoption period, and zero otherwise.

(Continued)

Table A-5 – Continued

<i>Post_IFRS_{LDSE}</i>	Equals one for observations from LowDiff countries with a strong degree of enforcement in the post-adoption period, and zero otherwise.
<i>Post_IFRS_{LDWE}</i>	Equals one for observations from LowDiff countries with a weak degree of enforcement in the post-adoption period, and zero otherwise.
<i>Post_IFRS_{GFC}</i>	Equals one for observations from IFRS countries in the years 2008 and 2009 of the post-adoption period, and zero otherwise.
<i>Post_IFRS_{NGFC}</i>	Equals one for observations from IFRS countries in the post-adoption period without years 2008 or 2009, and zero otherwise.
<i>Post_Announ</i>	Equals one for observations (loan facilities) issued in IFRS countries at fiscal years ending after the announcement date but before IFRS adoption, and zero otherwise.
<i>Post_Announ_{HD}</i>	Equals one for observations (loan facilities) issued in HighDiff countries in fiscal years ending after the announcement date but before IFRS adoption, and zero otherwise.
<i>Post_Announ_{LD}</i>	Equals one for observations (loan facilities) issued in LowDiff countries in fiscal years ending after the announcement date but before IFRS adoption, and zero otherwise.
<i>Pre_NonIFRS</i>	Equals one for observations from non-IFRS countries in the pre-adoption period, and zero otherwise.
<i>Post_NonIFRS</i>	Equals one for observations from non-IFRS countries in the post-adoption period, and zero otherwise.
<i>Size</i>	The natural logarithm of market capitalisation (in millions of U.S. dollars).
<i>MTB</i>	Market capitalisation to book value of equity.
<i>Leverage</i>	Total debt divided by total assets.
<i>ROA</i>	EBITDA divided by total assets.
<i>Tangibility</i>	Net PP&E divided by total assets.
<i>USFiling</i>	Equals one for observations from a firm that has SEC filings available, and zero otherwise.
<i>D_Secured</i>	Equals one if the debt contract is secured, and zero otherwise.
<i>D_Rating</i>	Equals one if credit ratings are available for the issued debt or borrower at the time of issuance, and zero otherwise.

(Continued)

Table A-5 – Continued

<i>InvestGrade</i>	Equals one if the average credit rating for the issued debt or borrower at the time of issuance is of investment grade (“BBB” or above for Standard & Poor’s and Fitch, and “Baa” or above for Moody’s), and zero otherwise.
<i>Yield Spread</i>	All-in-drawn for private loans or the yield to maturity at offering minus the benchmark (country-specific risk-free rate) for bonds (in percentages).
<i>Debt Size</i>	The debt offering amount (in millions of U.S. dollars).
<i>Maturity</i>	Debt maturity in number of months.
<i>Revolver</i>	Equals one if the debt contract has a revolving feature, and zero otherwise.
<i>Term Loan</i>	Equals one if the debt contract has a term feature, and zero otherwise.
<i>PerfPricing</i>	Equals one if the debt contract has a performance pricing feature, and zero otherwise.
<i>Investment Rstr</i>	Equals one if the debt contract contains at least one “Max Capex” covenant, and zero otherwise.
<i>Asset Sale Rstr</i>	Equals one if the debt contract contains at least one “AssetSalesSweep” covenant, and zero otherwise.
<i>Equity Issue Rstr</i>	Equals one if the debt contract contains at least one “EquityIssuanceSweep” covenant, and zero otherwise.
<i>Debt Issue Rstr</i>	Equals one if the debt contract contains at least one “DebtIssuanceSweep” covenant, and zero otherwise.
<i>Prepayment Rstr</i>	Equals one if the debt contract contains at least one “ExcessCFSweep” or “InsuranceProceedsSweep” covenant, and zero otherwise.