THREE ESSAYS ON THE CAPITAL STRUCTURE OF CANADIAN CORPORATIONS

By

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A Dissertation
Submitted to the Faculty of Graduate Studies
in Partial Fulfillment of the Requirements
for the Degree of

DOCTOR OF PHILOSOPHY

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ABSTRACT

This dissertation consists of three papers that examine to what extent several country-specific factors that particularly relate to the Canadian economy and capital markets impact the capital structure decisions of Canadian corporations. The first essay shows that, contrary to the US evidence, Canadian multinational corporations (MNCs) have higher leverage ratios than domestic firms (DCs). The higher leverage of Canadian MNCs is associated primarily with their US operations; their non-US operations have little impact on leverage. I also show that the negative impact of agency costs of debt and business risk on leverage is more pronounced for Canadian MNCs' non-US operations compared to their US operations, and the agency costs of debt is the dominant factor. Moreover, comparison with an industry and size matched US sample shows that the sensitivity of leverage to firm-specific factors also differs between the two country samples.

The second essay examines the impact of supply-side effects on the capital structure of Canadian firms. Consistent with Faulkender and Petersen (2006), I find that Canadian firms with bond market access, as measured by having a credit rating, have substantially higher leverage ratios than firms without access, after controlling for the determinants of leverage. Moreover, I argue that the impact of bond market access on leverage should be higher for Canadian low credit quality firms than for high credit quality firms, all else being equal. My findings support this premise and show that the impact of bond market access is driven largely by firms with low credit quality (non-investment grade).

The third essay tests whether market timing has a short-term or long-term impact on capital structure for a sample of Canadian firms that issued seasoned equity offerings. I also differentiate this impact between firms that cross-listed on the US exchanges and firms that only listed on the Toronto stock exchange. My analysis shows two main results. First, there is a weak short-term effect but no long-term effect of market timing on the capital structure of Canadian firms. Second, Canadian cross-listed firms raise substantially larger equity proceeds than non cross-listed firms, after controlling for the impact of market timing and other firm-specific factors. However, the short-term or long-term market timing impact on capital structure is not significantly different between cross- and non cross-listed firms.

Overall, this dissertation contributes to the existing literature on cross-country comparisons of capital structure and shows that the capital structure of Canadian corporations is influenced by a complex interaction of firm-, industry-, and country-specific factors.

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DEDICATION

This thesis is dedicated to my parents, my wife, and my son for their support and encouragement throughout the course of my Ph.D. studies.

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CHAPTER 1

GENERAL INTRODUCTION

A firm's capital structure is a mix of debt and equity. Modern capital structure research starts with the Nobel winning work of Modigliani and Miller (1958). Modigliani and Miller (1958) develop the famous capital structure irrelevance theory – that is, the market value of any firm is independent of its capital structure when the markets are frictionless and complete.[1] Modigliani and Miller (1958) contribute to the capital structure literature by answering the question: does capital structure matter for firm's value? Titman (2002, p.102) states, "... *by clearly stating the conditions under which these decisions have no relevance, the theorem provides a basis for examining how these choices can create and destroy value for a corporation.*"

After Modigliani and Miller (1958), a large number of theoretical and empirical studies emerge and they explore another question: if capital structure does matter, what are the factors that determine firms' financial decisions and maximize firm value and minimize the cost of capital? The trade-off theory and the pecking order theory provide some explanations of what those factors are.[2]

The trade-off theory suggests that a firm's optimal capital structure is determined by a trade-off decision between the positive impact of tax benefits of debt and the

[1] Modigliani and Miller's (1958) proposition I shows that levered firms should have the same value as unlevered firms. Otherwise, rational investors will realize arbitrage profits by adjusting their personal investment portfolios. Proposition I is based on a number of assumptions. For instance, there are no taxes, no transactions costs and no information asymmetry problem in the capital market. Moreover, all cash flows are perpetuities and individuals and firms can borrow or lend at the same interest rate.

[2] Harris and Raviv (1991) provide an excellent literature review on capital structure theories and evidence.

negative impact of costs related to financial distress and agency costs of debt.[3] The trade-off theory thus predicts that every firm has a target optimal leverage level. Some exogenous shocks could temporally cause a firm's leverage level to deviate from its target level but, within a short period of time, the firm should adjust its debt level back to the target level.

In contrast, the pecking order theory argues that the cost of information asymmetry is the most important factor in the capital structure decision and it predicts that there is no such optimal capital structure. Instead, a firm's financing decisions should follow a hierarchical financing order: first use internal funds, then borrow risk-less debt, then utilize risky debt and preferred stock, and finally use common stock as the last resort.[4]

However, whether the trade-off theory or the pecking order theory explains a firm's actual financial decisions is still in active debate. For example, Shyam-Sunder and Myers (1999) argue that the pecking order theory performs better than the trade-off theory with real data. However, several follow-up studies present evidence against that of

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[3] Modigiani and Miller (1963) relax the zero tax assumption and argue that there is a tax advantage in using debt financing as the interests on loans and bonds can be deducted from income for corporate tax purposes whereas there is no such tax advantage for equity financing. They show that a firm can maximize its value by borrowing as much debt as it can. However, increasing the debt level could increase firm's financial risk. Accumulating debt makes the firm obligated to pay interest and principal of debt in a pre-defined schedule. If the obligation is not met on time, the firm will face the risk of going bankrupt. Moreover, a higher debt level also leads to higher agency costs of debt problem. For example, Jensen and Meckling (1976) argue that, since bondholders have a fixed claim on the cash flows of a firm whereas shareholders have a residual claim on the cash flows, bondholders and shareholders have divergent interests in the firm and shareholders may pursue their own interest at the expense of bondholders.

[4] Myers and Majluf (1984) and Myers (1984) first propose the pecking order theory. Myers and Majluf (1984) show that managers, who have private information about the firm and attempt to maximize the interest of the existing shareholders, are motivated to issue over-priced equity at the cost of new investors. However, investors anticipate the managers' purpose and will interpret a new equity issue as a bad signal and will under-price the share prices. As a result, managers may give up positive NPV investment opportunities if they expect the possibility of under-pricing of new equity issuance. The pecking order theory predicts the managers should use internal funds first to finance investment projects, and use equity as a last choice.

Shyam-Sunder and Myers (1999) (see for example, Chirinko and Singha (2000), Hovakinmian, Opler and Titman (2001), Frank and Goyal (2003)). Fama and French (2002, p.30) suggest that, "*Who wins the confrontation between the tradeoff and pecking order models? On many issues there is no conflict...but when shared predictions are confirmed, attributing causation is elusive: we cannot tell whether the results are due to tradeoff forces, pecking order forces, or indeed other factors overlooked by both.*"

As the pace of globalization has accelerated in recent years, there is a growing interest in understanding whether and why firms' capital structure varies across countries. In their widely-quoted work, Rajan and Zingales (1995) compare firms' capital structures across G-7 countries and find that the capital structure pattern at an aggregate level and the leverage determinants are similar across these countries. They emphasize that future research should be devoted to understanding what causes the similar determinants although countries are different in their institutional environments. Booth, Aivazian, Demirguc-Kunt and Maksimovic (2001) examine the capital structure decisions for firms from ten developing countries and find that the variables that help explain capital structure decisions in developed countries are also valuable for the developing countries. They also suggest that knowing the nationality of the firm is usually as important as the size of independent variables for both the total and long-term book-debt ratios. Moreover, La Porta, Lopez-de-Silanes, Shleifer and Vishny (1997, 1998) argue that countries with better legal protection have greater external financing available in both the debt and equity markets.

In sum, the existing capital structure literature does not unanimously agree on what factors fully explain the observed leverage ratios. Megginson (1997) argues that this

is because every time consensus seems to be within reach, however, the evolution of financial theories as well as the innovation in financial markets make this goal challenging anew. In this thesis, I present three empirical essays on the capital structure of Canadian corporations. I examine whether and to what extent, several factors (including regional expansion versus global expansion of multinational firms, bond market access, market timing and cross-listings) that are specifically related to the Canadian economy and capital markets impact the capital structure decisions of Canadian corporations. This thesis not only offers a deep examination on how country-specific factors affect firms' capital structure decision, but also provides some future policy implications.

The Canadian samples are important and interesting for several reasons. First, the existing empirical research on capital structure largely focuses on United States (US) data. It is not clear whether the well-documented US evidence is similarly applicable to firms in other countries. Thus, my thesis provides fresh evidence on the capital structure of firms in a non-US country.

Second, many studies on cross-country comparison of capital structure use countries that are very different in tax regime, bankruptcy code, legal system, culture and language. It is not surprising for these studies to conclude that differences in institutional factors and the quality of the legal system could have important impact on capital structure. However, we have very little knowledge on whether a country that shares many similarities (such as geographic proximity, business practices, accounting rules and disclosure requirement as well as cultural and language) with the US will have a similar or a different capital structure pattern. My thesis fills this gap.

Third, the literature suggests that although market segmentation has attenuated over the years, some barriers still exist that restrict capital flows across different nations. Thus, firms in a small and segmented capital market could face a very limited supply of capital and higher costs of capital. The size of Canadian capital markets is very small compared to the US. For example, at the year-end 2002, the share of Canadian and US debt market in the global debt market is 2.7% and 48.6%, respectively. Moreover, the market capitalization of the US equity market is more than 10 times larger than that of Canadian equity markets ($14,266 billions versus $1,215 billions at year-end 2003) (Hendry and King (2004)). However, the small domestic capital market does not limit the financing opportunities of Canadian corporations. Relative to firms in other countries, Canadian firms have easy access to the larger, deeper, and more liquid US capital market. The implementation of Multi-jurisdictional Disclosure System (MJDS) in July 1991 that aimed to lower the accounting barriers and disclosure requirements provides Canadian firms easier access to the US equity market. Moreover, recent evidence shows that the market segmentation between Canada and US is declining over the years (see for example, Mittoo (2003)). As a matter of fact, Canadian corporations rely heavily on the US capital market as many Canadian firms choose to cross-list on the US exchanges and more than 50 percent of Canadian corporate debt is raised in the US.

My thesis consists of five Chapters. Chapter 1 provides a general introduction. Chapter 2 examines the capital structure of Canadian multinational corporations (MNCs). Financial theory suggests that MNCs should have higher leverage than domestic corporations (DCs) because of their larger firm size, lower cash flow volatility, and easier access to international capital markets. However, almost all research on the MNCs'

capital structure has been done in the US context and finds puzzling evidence that the US MNCs have lower leverage ratio compared to their domestic peers (see for example, Fatemi (1988), Burgman (1996), Chen, Cheng, He and Kim (1997) and Doukas and Pantzalis (2003)). Several explanations, such as higher agency costs of debt, higher business and political risk of MNCs, have been offered for the US evidence but there is no consensus on which factors drive this puzzling evidence.

I compare the capital structure difference between Canadian MNCs and DCs, and also compare the Canadian sample with a US matched sample for the period of 1998-2002. I contribute to the MNCs capital structure literature in three ways. First, contrary to the US evidence, I find that Canadian MNCs display higher leverage than DCs. Second, the higher leverage of Canadian MNCs is associated largely with their US operations, and is explained by their larger firm size and better access to the US capital market. I also show that the negative impact of agency costs of debt and business risk on leverage is more pronounced for Canadian MNCs' non-US operations compared to their US operations, and the agency costs of debt is the dominant factor. Third, to minimize the sample variation between Canada and the US, I construct a US sample that is matched with the Canadian sample based on year, industry and firm size. I show that the sensitivity of leverage to the firm-specific factors also differs between the two country samples. Overall, Chapter 2 shows that the capital structure of MNCs is influenced by a complex interaction of home and host country factors as well as the differences in the leverage determinants across countries. It also suggests that future research on MNCs' capital structure should differentiate between MNCs' regional and global expansions.

Chapter 3 examines the impact of bond market access on Canadian firms' capital structure during the period of 1990-2003. Access to the public bond market could be very important for firms' capital structure decisions as it can change the maturity as well as the costs of debt. The traditional capital structure literature, however, largely focuses on the capital demand-side effects (e.g. firms with larger size, lower growth opportunity and lower business risk could have higher debt ratios), implicitly assuming that supply-side effects do not matter. In a recent study, Faulkender and Petersen (2006) examine whether the source of capital affects firms' capital structure and show that the US firms with bond market access, as measured by having a credit rating, have significantly higher leverage ratios than firms without access.

I show two main findings in Chapter 3. First, I test the impact of supply-side effects on leverage by comparing the leverage difference between Canadian firms with and without bond market access, after controlling for demand-side effects. My evidence supports that of Faulkender and Petersen (2006) and shows that Canadian firms with credit ratings have 5.6% (5.9%) higher market (book) debt ratio than firms without ratings, all else being equal.

Second, I argue that the impact of bond market access on leverage could differ between firms with high and low credit quality. This perspective has not been examined in prior studies. On the one hand, the investment regulation that restricts some institutional investors from investing in low credit quality firms could lead to a relatively lower supply of capital and, thus, a weaker impact on leverage for such firms compared to their high quality peers. On the other hand, low credit quality firms may raise significantly larger amount of debt in public bond markets because of more severe

supply-side constraints, and be less concerned about maintaining credit ratings compared to high credit quality firms. Which effect dominates is an empirical issue. Moreover, one feature about the Canadian bond market is that the domestic bond market is very small and illiquid. Canadian high credit quality firms have the option to raise debt domestically and in the US whereas Canadian low credit quality firms have no option but to rely solely on the US high-yield market.

I find that the significant impact of bond market access on leverage is driven largely by the low credit quality firms. The impact of bond market access on leverage for low credit quality firms is almost five times that for high credit quality firms (9.7% versus 2.0%). Overall, Chapter 3 provides evidence suggesting that supply-side effects on leverage could vary between firms with and without bond market access, firms with high and low credit quality, as well as the home country of the firm based on the development of domestic bond market and access to the international bond markets.

Chapter 4 examines the impact of market timing on firms' capital structure. Market timing is an important issue in corporate finance research. Recently, whether and to what extent market timing has a short-term or long-term impact on firms' capital structure has received increased attention among researchers, but the issue is still under active debate. For example, Baker and Wurgler (2002, *p*.3) propose a market timing theory whereby "*capital structure is the cumulative outcome of attempts to time the equity market*", and show that market timing has a pronounced and persistent effect (around ten years) on capital structure and leverage is significantly and negatively related to the historical external finance weighted-average market-to-book ratio (M/B_{efwa}). In contrast, Alti (2005) uses a 'HOT' market dummy to identify market timers as those that

go public in the hot initial public offering (IPO) market, and shows that the market timing effect disappears after two years. Moreover, Leary and Roberts (2006) argue that capital structure rebalancing is costly. They find that when firm's debt issuance costs are high, the market timing effect is long lasting. However, when the debt issuance costs decline, the market timing effect declines as well.

The existing evidence on the impact of market timing on capital structure is mainly based on the US IPO samples. There is no prior evidence on whether the observed US results are applicable to other countries or to firms that issued seasoned equity offerings (SEOs). In Chapter 4, I examine whether market timing has a short-term or long-term impact on firms' capital structure for a sample of Canadian SEO firms during the 1985-2003 period. I also contribute to this line of literature by comparing the market timing effect between Canadian cross- and non cross-listed firms. This perspective has not been examined in prior studies. I predict that cross-listed firms should have better market timing opportunities than their non cross-listed peers because of three reasons: cross-listers have better access to international capital markets, lower information asymmetry level, lower 'home bias' concerns of US investors and better corporate governance. If the domestic market is performing poorly but the US market is performing well, Canadian cross-listed firms can escape from the domestic market and choose to raise capital in the US market.

I find that there is a weak short-term market timing effect for Canadian SEOs but no long-term effect of market timing on capital structure. This result is partially due to the fundamental difference between the IPO and SEO events. The IPO represents a very important step for a firm to transform from privately owned to publicly traded. Once a

firm goes public, the weight of book equity in the balance sheet will increase substantially and, as a result, the book debt ratio will drop significantly. In contrast, the new equity raised by a SEO will moderately increase the weight of book equity in the capital structure, but the increase will be much smaller than in the case of an IPO.

Moreover, the short-term impact of market timing on leverage is mainly reflected in the market-to-book ratio rather than the 'hot' market effect, and is mainly through the net equity issuance, thereby supporting the market timing hypothesis and consistent with Baker and Wurgler (2002). I also show that cross-listed firms raise substantially higher equity proceeds than non cross-listed firms, after controlling for the impact of market timing and other firm-specific factors. However, I do not find any significant difference between cross- and non cross-listed firms with respect to either the short-term or long-term effect of market timing on capital structure.

Finally, Chapters 5 discusses the general conclusions.

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CHAPTER 2

THE CAPITAL STRUCTURE OF MULTINATIONAL CORPORATIONS

Abstract

Several empirical studies document puzzling evidence that US multinational corporations (MNCs) have lower long-term debt ratios than domestic corporations (DCs). I examine the capital structure of Canadian MNCs in the 1998-2002 period, and find that Canadian MNCs exhibit about 3 to 4 percent higher long-term debt ratios than Canadian DCs, contrary to the US evidence. This higher leverage of Canadian MNCs stems largely from their US operations; expansion in non-US markets has little impact on leverage. The negative impact of agency costs of debt and business risk on leverage is more pronounced for Canadian MNCs' non-US operations compared to their US operations, and the agency costs of debt is the dominant factor. Access to the US bond market also significantly increases the leverage ratio of Canadian firms, and this impact is more pronounced for MNCs. The comparison with an industry and size matched US sample shows that the sensitivity of leverage to firm-specific factors also differs between the two country samples.

JEL Classification: G32

Keywords: Capital Structure, Multinational Corporations, Canada

2.1. Introduction

Financial theory predicts that multinational corporations (MNCs) should have higher leverage compared to domestic corporations (DCs) because of their relatively larger firm size, lower cash flow volatility, and increased access to international capital markets. However, several studies document that US MNCs display lower debt ratios than domestic corporations, contrary to this prediction (see for example, Fatemi (1988), Lee and Kwok (1988), Burgman (1996) and Doukas and Pantzalis (2003)). Several explanations, such as higher agency costs of debt, and higher business and political risk, have been offered for the US evidence but there is no consensus on what factors drive this puzzling evidence.

To date, most prior research on MNCs' capital structure has been done in the US context. To what extent the finding, and the explanations offered in the US case hold in other countries is an important but a largely unexplored issue. This Chapter attempts to fill this gap in the literature by examining the capital structure of Canadian MNCs in the 1998-2002 period. I ask three main questions: (i) Does the leverage of Canadian multinationals differ from their domestic peers? and if so, what factors drive this difference? (ii) Does the access to the US capital market influence the capital structure of Canadian firms? and if so, does it explain the leverage difference between MNCs and DCs? and (iii) Does the capital structure of Canadian MNCs differ from the US MNCs and if so, what factors explain this difference?

Several recent studies show that country-specific factors have a strong influence on firms' capital structure (see for example, Rajan and Zingales (1995) and Booth, Aivazian, Demirguc-Kunt and Maksimovic (2001)). This influence is likely to be more

pronounced for the MNCs because, unlike domestic firms, they have to deal with the institutional environments of both home and host countries. Untangling the country-specific effects from industry- and firm-specific effects in a multi-country setting is a challenging task. I attempt to provide some insights into these effects by using a two-country setting.

The Canada-US comparison is appealing for a number of reasons. First, Canada and the US have very similar institutional and regulatory structures but have significant differences in firm characteristics. For example, Canadian firms are smaller, more closely held, and a relatively large percentage of them are concentrated in the resource sector compared to their US peers. These differences allow me to examine the influence of firm and industry characteristics on MNCs' leverage in an independent non-US sample with a similar legal and institutional environment. I compare the capital structure of Canadian MNCs and DCs with that of an industry and size matched sample of US MNCs and DCs to examine whether the determinants of capital structure are similar or different between the two countries.

Second, in contrast to US MNCs that tend to expand globally across several regions and countries, most Canadian MNCs have a major proportion of their foreign operations concentrated in the US market. This dichotomy between the US and non-US operations provides me a natural experiment to test hypotheses that predict different effects on leverage based on the geographical orientation of the MNCs. I test two such hypotheses that have been offered as plausible explanations for the puzzling US evidence: *the agency costs of debt* and *the upstream-downstream hypotheses*. Doukas and Pantzalis (2003) examine the capital structure of US MNCs in the 1988-1994

period and conclude that the lower leverage of US multinationals stems from their higher agency costs of debt because the US MNCs' global operations make it more difficult and expensive for bondholders to actively monitor the firms. Kwok and Reeb (2000), on the other hand, argue that the lower leverage of the US MNCs reflects the increase in their business risk as a result of their expansion from a stable economy to less stable economies around the world (*going downstream*). They provide supporting evidence that firms from emerging markets experience a decrease in business risk and an increase in leverage because they move from less stable economies to more stable economies (*going upstream*), consistent with the hypothesis. They conduct their analysis for developed and emerging markets at the aggregate level and do not control for the effects of country-specific factors on leverage. I test both hypotheses in the same country sample by examining whether the negative impact of the agency costs of debt and business risk on leverage are more pronounced for the Canadian MNCs' global (non-US) operations versus the US operations, and if so, which of the two effects is more dominant.

The Canadian capital markets have several unique features that also facilitate a test of the impact of access to global bond markets on the MNCs' leverage. First, the Canadian capital market is significantly smaller, and less liquid compared to the US capital market. For example, the Canadian bond market comprises less than 5 (2.5) percent of the US (global) bond market. Thus, access to international bond markets is likely to be an important determinant of firm leverage because the supply of domestic capital is likely to be limited for large Canadian firms. Second, the 1991 Canada-US Multi-jurisdictional Disclosure System (MJDS) allows large Canadian firms to raise debt in the US capital market using the disclosure requirements of their home country. As a result, the percentage of Canadian firms

that access the US bond market has risen steadily over time and US-dollar-denominated bonds comprise about half of Canadian bond issues. I examine whether the easy access to the US bond market is associated with higher leverage for large Canadian firms, and whether Canadian MNCs have higher leverage than DCs because of their US and global (non-US) operations.

Contrary to the US evidence, I find that the Canadian MNCs display between 3 to 4 percentage higher long-term debt ratios but similar short-term ratios compared to domestic firms, after controlling for industry and firm characteristics. The higher leverage of Canadian MNCs stems largely from their US operations; expansion in non-US markets has little impact on leverage. I also find that the negative impact of agency costs of debt and business risk on leverage is more pronounced for Canadian MNCs' non-US operations compared to their US operations, and the agency costs of debt is the dominant factor. Furthermore, access to the US bond market also significantly increases the leverage ratio of Canadian firms, and this impact is more pronounced for MNCs. The comparison with an industry and size matched US sample suggests that the sensitivity of leverage to firm-specific factors also differs between the two country samples. Overall, my results support the view that the capital structure of MNCs may be a complex interaction of home and host country factors as well as differences in the determinants of leverage across countries.

The remainder of Chapter 2 is organized as follows. In Section 2.2, I review and summarize the previous theoretical and empirical research. In Section 2.3, I describe the data. I include the empirical analysis in Sections 2.4 and 2.5. I discuss conclusions in Section 2.6.

2.2. The Capital Structure of Canadian Multinationals: Hypotheses

Canadian multinationals differ significantly from their US peers with respect to their international activities. In contrast to US MNCs that expand globally, many Canadian MNCs have a large proportion of their activities in the US. The degree of their US operations differs significantly across firms; some focus primarily in the US, others mainly in the global markets, whereas most operate across both the US and non-US countries. The dichotomy between the US and non-US operations of Canadian MNCs provides a unique sample to test the implications of theories that predict different effects on leverage based on the geographical orientation of the MNCs, keeping the home country effects fixed. In this section, I focus on three such theories: *agency costs of debt, upstream-downstream hypothesis, and access to international bond markets,* and develop their testable implications for the Canadian MNCs.

2.2.1. Agency Costs of Debt

The agency costs of debt arise because the conflicts of interest between bondholders and shareholders can lead to sub-optimal investment decisions that are detrimental to the interest of bondholders. For example, Jensen and Meckling (1976) show that shareholders may accept high-risk-high-return projects to transfer wealth from bondholders to shareholders. The higher agency costs of debt can lead to higher costs of debt and lower leverage because bondholders must devote more resources to monitoring and bonding activities.

Multinational firms are likely to have higher agency costs of debt than domestic firms because of two reasons. First, the geographic diversification of multinationals'

operations makes it more difficult for bondholders to gather information and monitor their business operations relative to domestic firms. Lee and Kwok (1988) suggest that the monitoring and bonding costs for MNCs could be substantial. Burgman (1996) argues that the differences in language and legal systems as well as greater information gaps across countries could result in higher monitoring costs for MNCs. Second, MNCs are also likely to have higher growth opportunities than DCs (see for example, Moffett, Stonehill and Eiteman (2003)).[5] Myers (1977) argues that levered firms with greater growth opportunities are more likely to have an under-investment problem because shareholders have incentives to bypass positive NPV projects if they perceive that bondholders could capture the majority of benefits from those projects.[6] Overall, the higher monitoring costs and greater growth opportunities of MNCs could result in higher agency costs of debt and consequently, lower leverage for MNCs compared to DCs.

Doukas and Pantzalis (2003) provide an in-depth investigation of whether agency costs of debt could explain the lower leverage of the US MNCs in the 1988-1994 period. They use three different measures of agency costs of debt: market-to-book equity ratio (proxy for future growth opportunities), non-collateralized asset ratio (proxy for intangible assets), and asset liquidity ratio (proxy for free cash flows). They document that the agency costs of debt have a strong negative impact on long-term debt ratio, and this negative impact increases as the firm's foreign involvement rises. They conclude that their evidence is consistent with the notion that geographic diversity of MNCs makes

[5] Moffett et al. (2003) suggest that MNCs are more likely to have greater growth opportunities than DCs because of their better access to larger international product markets, richer raw material resources, lower labour costs, and leading technology.

[6] Barclay and Smith (1995) examine a large US sample during the period between 1974 to 1992, and their evidence strongly supports the implication of Myers (1977). They find that large and regulated firms with few growth options tend to use more long-term debt. Moreover, firms with more growth options issue more short-term debt.

active monitoring more difficult and expensive for bondholders, and results in higher agency costs of debt and lower leverage for MNCs compared to DCs.

The impact of agency costs of debt is likely to differ for Canadian MNCs that focus on the US market versus those that expand their operations globally. The geographic proximity and the close economic and business linkages between the US and Canada make it easier for bondholders to collect information on MNCs' US operations. Further, the similarity in the accounting practices and disclosure requirements between the two countries also lowers the cost of analyzing information on US operations. In contrast, the collection and analysis of information on Canadian MNCs' non-US operations is likely to be more difficult because of the geographical distances as well as differences in language and accounting regulations across the non-US countries. Thus, while the agency costs of Canadian MNCs would be higher than that of DCs, the difference between the two groups would stem primarily from the MNCs' non-US operations. This leads to the following hypothesis:

H1: *The negative impact of the agency costs of debt on leverage is more pronounced for Canadian MNCs' non-US operations compared to their US operations.*

2.2.2. Upstream-downstream Hypothesis

The traditional theory of international diversification predicts that MNCs should have lower business risk and lower cash flow volatility than DCs because their return streams are not perfectly correlated across countries (Hughes, Logue and Sweeney (1975) and Shapiro (1978)). Recent studies, however, suggest that MNCs could have higher business risk than DCs. For example, Burgman (1996) argues that MNCs are exposed to

several unique risks of internationalization, such as political risk, foreign exchange risk, and inflation risk that are difficult to be fully diversified away. These risks could overweigh the benefit of lower correlation associated with international diversification, especially with the growing integration of the world economy in recent years. Reeb, Kwok and Baek (1998) document that the international activities of the US MNCs actually increase their business risk as measured by systematic risk in the CAPM framework.

Kwok and Reeb (2000) develop the upstream-downstream hypothesis that predicts different effects on the business risk of MNCs based on the relative risk in the home and target country. They argue that when an MNC based in a more (less) stable economy expands its operations into less (more) stable economies, the MNC's overall beta may increase (decrease) because the betas of its international projects could be higher (lower) than the average beta of the firm. This hypothesis predicts that when MNCs domiciled in less (more) stable economies make international investments, they would experience a decrease (increase) in their business risk and, consequently, would have a higher (lower) financial leverage, compared to DCs. Kowk and Reeb (2000) test this hypothesis in a sample of 1,921 firms from 32 countries from 1992 to 1996, and show that for the US based firms, the foreign asset ratio, which is a proxy for the degree of internationalization, is positively associated with total risk and negatively associated with leverage whereas the opposite is true for firms from the emerging markets.

The upstream-downstream hypothesis implies that the effect of Canadian MNCs' US operations on business risk and leverage is likely to be different from that of non-US operations. Although Canada is a highly developed country, its economy is primarily

resource based and is less diversified compared to the US economy. Canadian MNCs would benefit from expanding their operations in the larger, more diversified, and more stable US market. The effect on business risk for Canadian MNCs that focus on the US should also be minimal because the two countries have highly integrated economies. In contrast, Canadian firms that expand globally should experience a more negative effect on business risk because they move from a stable economy to less stable economies and face more risk and uncertainties. Since leverage is inversely related to the firm's business risk (Harris and Raviv (1991)), I would expect that the negative impact of business risk on leverage should be more pronounced for Canadian MNCs' expansion in the global (non-US) versus the US market. I examine the following hypothesis:

H2: *The negative impact of business risk on leverage is more pronounced for Canadian MNCs' non-US operations compared to US operations.*

2.2.3. International Bond Markets Access

Access to international capital markets allows firms to overcome barriers to capital flows that cause segmentation across national capital markets and, consequently, to raise capital at a lower rate. Multinational corporations are likely to have higher access to international capital markets relative to domestic firms because their international operations allow them to tap capital across different countries and in the global market. The ability of multinationals to tap the global bond market implies that they can raise a large amount of debt capital at a relatively lower cost and, consequently, can support higher leverage than DCs. The higher access to the international equity markets, on the other hand, implies a lower leverage for MNCs because it allows them to raise equity capital at a lower cost. Pagano,

Roell and Zechner (2002) show that European firms that cross-list in the US raise more equity and exhibit lower leverage ratios compared to their domestically listed peers. Thus, to examine the net effect on leverage, I need to untangle the two opposite effects. This is not an easy task because the impact of international capital market access is also likely to vary across countries depending on the size and development of their capital markets as well as their segmentation from the global markets.

The Canadian capital market has several unique features that facilitate a test of the net effect of capital market access on the capital structure of MNCs. First, the Canadian capital market is significantly smaller, and less liquid than the US capital market. For example, the Canadian debt market comprises only 1.5% of the global market compared to the US market that comprises about half (47.6%) of the global bond market at the end of year 2003 (Hendry and King (2004)). The market capitalization of the US equity market is also more than 10 times that of the Canadian equity market ($14,266 billion versus $1,215 billion at year-end 2003). Thus, a Canadian firm that wants to raise a large amount of capital in the domestic capital market is likely to face a limited supply of funds and a higher cost of capital. Access to the US and global capital markets are likely to be an important determinant of leverage for Canadian firms because it lowers the supply-side constraints for firms. Second, the Canadian bond market is relatively integrated with the US bond market, especially for large firms. The 1991 Canada-US MJDS allows eligible issuers of investment grade debt and preferred shares to make cross-border security offerings using the Canadian disclosures. As a result, there has been a gradual decline in Canadian-dollar issues, and a rise in US-dollar issues over time. Currently, the US-dollar-denominated debt comprises about half of the Canadian bond market. Freedman and Engert (2003)

summarize three main reasons for the attractiveness of the US bond market for Canadian firms. First, the US market is larger and deeper and thus can absorb large issues easily. They note that the average issue size of a US-dollar-denominated bond is about three times larger than a Canadian-dollar-denominated bond. Second, the US market also offers longer term to maturities than the Canadian market. Third, the US-dollar denominated debt also allows Canadian firms to hedge their foreign exchange exposure. These factors are likely to be more relevant for the Canadian MNCs; they tend to be larger than DCs, and have a higher need for hedging their foreign exchange exposure. For example, Kedia and Mozumdar (2003) show that US multinationals raise funds abroad primarily to hedge their foreign exchange exposure. Bancel and Mittoo (2004) report that European managers cite hedging needs as the major consideration in raising debt in foreign markets. Reeb, Mansi and Allee (2001) find that the cost of debt financing is inversely related to the degree of firm internationalization. Finally, a large number of Canadian firms are also cross-listed on the US exchanges, and that allows me to examine and control for the impact of higher access to the US equity market on leverage.

Overall, the higher access of the MNCs to the global bond market implies that Canadian MNCs should be able to support higher leverage than DCs. I should expect a positive impact on leverage as a firm expands its operations in both US and non-US markets. I test the following hypothesis:

H3: *The higher access of Canadian MNCs to the global bond market implies higher leverage for the MNCs relative to DCs.*

2.3. Canadian Sample and Data

2.3.1. Sample

The initial sample comprises all publicly traded Canadian firms in the Worldscope database from the fiscal years 1998 to 2002. I begin with 4,824 firm-year observations. Consistent with the prior studies, I exclude financial and utility firms with primary SIC codes ranging between 4000-4999 and 6000-6999.[7] I also exclude observations with negative book value of assets or equity. I also require that the sample firms should have complete data on all firm-specific variables that are commonly associated with leverage in the literature, such as firm size and market-to-book value (see Table 2.A1). The final sample consists of 1,821 firm-year observations.[8]

I define a firm as an MNC if it reports foreign assets and foreign sales ratios of 10% or more, and as a DC if it reports no foreign assets and foreign sales, similar to that in Doukas and Panzalis (2003). These classifications are based on the requirement of Canadian CA Institute General Accounting Section 1701 and the US Statement of Financial Accounting and Standard No. 14 (FASB 1976). Based on these classifications, the Canadian MNCs and DCs samples consist of 592 and 1,229 firm-year observations, respectively.[9]

2.3.2. Comparison of Leverage

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[7] Due to the regulation, utility and financial firms have specific capital requirements. Thus, including these firms in the sample could bias the result. Moreover, including financial firms will strongly affect the result as Rajan and Zingales (1995) argue that the nature of financial firms' liabilities is very different from that of non-financial firms.

[8] This is an unbalanced panel sample. In detail, 111 firms have 5 years observations; 112 firms have 4 years observations; 144 firms have 3 years observations; 114 firms have 2 years observations; 158 firms have 1 year observations.

[9] I also experiment with two less stringent classifications of MNCs: foreign sales ratio>=10% and foreign assets ratio>0%, or foreign sales ratio>0% and foreign assets ratio>=10%. The key result that Canadian MNCs have significantly higher leverage than DCs remains the same.

I use three measures of leverage: Long-term debt ratio (LTdebt), Short-term debt ratio (STdebt), and Total debt ratio (TotalDebt). LTdebt is defined as long-term debt over the sum of total debt and market value of equity. STdebt is defined as the sum of short-term debt and current portion of long-term debt over the sum of total debt and market value of equity. TotalDebt is measured as the sum of LTdebt and STdebt. All three debt ratios are expressed in percentage terms.

[Insert Table 2.1 about here]

Table 2.1 compares the leverage ratios for Canadian MNCs and DCs. The total debt ratio shows that MNCs have higher leverage ratio than DCs (30.57% versus 24.30%), and the difference is significant at the 1% level. The average LTdebt for MNCs is about 45% ((22.93%-15.87%)/15.87%) higher than that of DCs whereas the average STdebt is very similar between MNCs and DCs (7.66% versus 8.37%). The results are similar when I compare the median leverage ratios. Thus, the evidence indicates that the difference in TotalDebt between MNCs and DCs stems mainly from the difference in their LTdebt.

The last four columns in Table 2.1 provide a breakdown of the MNCs' leverage ratios by the degree of firm's international involvement measured by the percentage of both foreign assets and foreign sales. The evidence shows that LTdebt (STdebt) for the MNCs remains higher (similar) compared to that of DCs at different levels of internationalization. This finding is opposite to that documented in the prior US studies

and could reflect the differences in firm characteristics or in geographic orientation of the US and Canadian MNCs.

2.3.3. Comparison of Industry and Firm Characteristics

Table 2.2 provides the industry composition of my sample based on the first two-digit primary SIC codes. The majority of the sample is concentrated in Manufacturing (40.42%) and Resource (30.09%) sectors, followed by Service (16.69%), and Trade (10.60%) sectors. Construction and Agriculture sectors only comprise less than 2.25% of the sample. The proportions of MNCs and DCs vary across the three largest sectors as follows: Resource (26.86% *vs.* 31.65%), Manufacturing (50.00% *vs.* 35.80%), and Service sectors (15.54% *vs.* 17.25%). However, the MNCs display consistently higher long-term debt ratios than DCs but similar short-term debt ratios across all the sectors. The magnitude of the difference in LTdebt between MNCs and DCs varies between 0.3% to 7.3% across sectors, except in the Construction and Agriculture sectors that represent only a small part of the sample.

[Insert Table 2.2 about here]

Table 3 compares several firm characteristics that are commonly associated with capital structure across MNCs and DCs. The MNCs differ from DCs on several dimensions but the most striking difference is in firm size. The MNCs are much larger than DCs across the whole distribution (e.g. 25th, 50th and 75th percentiles). The average annual sales ($millions) of a typical Canadian MNC is $1727.29M, about three times

larger than that of a typical DC ($675.49M) whereas the median size ($321.61M) of an MNC is about five times that of DCs ($58.27M). The MNCs also have higher profitability (PROFIT) and lower cash flow volatility (RISK) than DCs, and the differences between the two groups are statistically significant at the 1% level. The growth opportunities (M/B), asset tangibility (TANGIBLE ASSET), and non-debt tax shields (NDTS) are very similar between the two groups.[10] These differences suggest that I need to control for industry and firm characteristics for any meaningful comparisons of leverage between the MNCs and DCs.

[Insert Table 2.3 about here]

2.4. The Capital Structure of Canadian MNCs: Regression Analysis

In this section, I examine whether the Canadian MNCs have higher leverage compared to the DCs after controlling for the firm-specific determinants of capital structure and whether the *agency costs of debt*, *upstream-downstream*, and *international bond market access* hypotheses can explain this difference.

2.4.1. Basic Regression Results

My basic regression model is as follows:

$$\text{LEVERAGE}_{it}=\alpha_1+\beta_1\text{MNC}_{it}+\beta_2\text{M/B}_{it}+\beta_3\text{TANGIBLE ASSET}_{it}+\beta_4\text{NDTS}_{it}$$
$$+\beta_5\text{SIZE}_{it}+\beta_6\text{PROFIT}_{it}+\beta_7\text{RISK}_{it}+\Sigma\gamma_j\times\text{INDUSTRY}_j+\Sigma\theta_T\times\text{YEAR}_T+\varepsilon_{it} \quad (1)$$

[10] I also analyze the sample by removing the extreme values (less than 1% percentile and above 99% percentile). The results are quantitatively similar to the findings reported here.

where $LEVERAGE_{it}$ denotes the LTdebt or STdebt ratio for firm *i* in year *t*. The main test focuses on whether the coefficient on MNC, a dummy variable that equals one if the firm is a multinational firm and zero otherwise, is positive and significant.

The other independent variables in the regression include firm-specific variables that are commonly used in the literature, five industry dummy variables that represent resource, construction, manufacturing, trade and service sectors, and four year dummies to control for the time-variation in capital structure (see for example, Rajan and Zingales (1995), Booth et al. (2001) and Doukas and Pantzalis (2003)).

A summary of the firm-specific variables and their predicted correlations with leverage is provided in Table 2.A1. The market-to-book ratio (M/B) is the market value of equity divided by the book value of equity, and is a proxy for the firm's growth opportunities. Myers (1977) predicts that leverage is inversely associated with the firm's growth opportunities because of the higher potential agency costs of debt in high growth firms. Thus, M/B also provides a measure of agency costs of debt. The ratio of net plant and equipment over total assets is a proxy for the asset tangibility (TANGIBLE ASSET). Prior studies document a positive relation between asset tangibility and leverage (see for example, Titman and Wessels (1988)). The ratio of depreciation over total assets is a proxy for the non-debt tax shields (NDTS) and it is expected to be negatively related to leverage because the tax benefit from additional debt financing declines with the increase in non-debt tax shields (DeAngelo and Masulis (1980)).

Firm size (SIZE) is defined as the natural logarithm of total sales. Warner (1977) suggests that the direct cost of bankruptcy declines with firm size, and predicts a positive

relation between firm size and leverage. Cash flow volatility (RISK) is the standard deviation of cash flows divided by sales over the past five years, and it measures the expected bankruptcy costs.[11] The trade-off theory suggests that a firm with volatile cash flows will utilize less debt in its capital structure in order to avoid potential bankruptcy costs. Firm profitability (PROFIT) is defined as the average of net income over sales for the past three years. The firm's profitability and leverage could be negatively (Myers (1984)) or positively correlated (Ross (1977) and Jensen (1986)).

[Insert Table 2.4 about here]

The regression model (1) is estimated using White's (1980) procedure that adjusts for the heteroskedasticity in standard errors. The results for both LTdebt and STdebt are reported in Table 2.4. The coefficients on the industry and year dummies are not shown in the table to conserve space.

The regression results support the hypothesis that Canadian MNCs have significantly higher long-term debt ratios compared to DCs, even after controlling for the industry- and firm-level determinants of leverage. The coefficient on MNC is positive (3.39) and statistically significant at less than the 1% level (t=3.39) in the regression of LTdebt ratio (column (1)).[12] The coefficients on most of the firm-specific variables are also significant and consistent with their predicted signs in this regression. SIZE and TANGIBLE ASSET are the most important determinants of leverage for Canadian firms.

[11] The RISK variable is calculated based on the past five years' cash flow to sales information. For example, I use the information from year 1993 to 1997 to calculate the value of RISK in year 1998. This is the reason that my final sample covers the period from 1998 to 2002, although the Worldscope database provides ten years data (1993-2002). In sum, the RISK variable is not calculated on an "in sample" basis.

[12] I also use the first 2-digit or 3-digit SIC codes as alternative industry dummies. The results are very similar to the reported findings.

The coefficients on both variables are positive and statistically and economically significant. For a typical Canadian firm, the long-term debt ratio increases by 6.6 percent as the firm size, measured by annual sales, increases from the 25th percentile ($17.29M) to the 75th percentile ($400.54M). The impact of the TANGIBLE ASSET on leverage is even more pronounced; leverage increases by 15.3 percent as the firm's tangible assets ratio increases from the 25th percentile (15.26%) to the 75th percentile (67.22%). The market-to-book ratio, non-debt tax shields, cash flow volatility, and profitability also have significant coefficients and are negatively related to the long-term debt ratio, as expected.

In contrast to the long-term debt ratio, the coefficient on MNC is not significant at any level in the regression of the short-term debt ratio (column (2)). Moreover, the short-term debt ratio is not significantly related to most of the firm-specific variables. This evidence supports that the difference in leverage ratio of MNCs and DCs stems largely from the difference in their long-term debt ratios.

I also check the robustness of my main finding that the Canadian MNCs display higher long-term debt ratios than DCs (results are not tabulated here). First, I examine the sensitivity of the result to different measures of leverage. I use three alternative long-term debt ratio measures: (*i*) the ratio of long-term debt over the sum of long-term debt and market value of equity, (*ii*) the ratio of long-term debt over the sum of total debt and book value of equity, and (*iii*) the ratio of long-term debt over total assets. The results using these alternative measures are quantitatively similar to that of LTdebt. The coefficient on MNC is positive (ranging from 2.31 to 3.78) and significant at the 1% level for different measures. The coefficients on most of the explanatory variables are also similar to that in

Table 2.4.

Another potential concern is that the result could vary between resource and non-resource firms. Since most commodities are priced in US dollars, it is likely that Canadian resource based firms have higher hedging needs, and consequently have higher leverage than non-resource firms. I run separate regressions for the resource and non-resource sub-samples. I find the coefficient on MNC is positive and significant at the 5% level for both resource (t=2.14) and non-resource (t=2.44) sub-samples, although its magnitude is slightly larger for the resource than the non-resource firms (3.59 versus 2.99). This result supports that the higher leverage ratios of MNCs is not driven by the resource sector. In the remainder of the paper, I focus on the analysis of the long-term debt ratio to examine the capital structure of the MNCs.

2.4.2. Test of Hypotheses

In this section, I examine several hypotheses that may explain the different leverage ratio between MNCs and DCs. I first test the implications of *agency costs of debt* and *upstream-downstream* hypotheses that have been individually tested in the US context in prior studies. I examine these two theories simultaneously in order to discriminate between the two because they generate very similar predictions for the effects of Canadian MNCs' US and non-US operations on leverage. Next, I test the impact of access to international bond markets on the capital structure of MNCs that has not been investigated formally in the prior literature. The results are reported in Table 2.5.

[Insert Table 2.5 about here]

2.4.2.1. Agency Costs of Debt and Upstream-downstream Hypotheses

Both these hypotheses predict that Canadian MNCs' expansion into the global (non-US) markets should be associated with more negative impact on leverage compared to the expansion into the US market, although the underlying factors that impact leverage are different. The agency costs of debt hypothesis states that the negative impact on leverage arises primarily from the increased monitoring costs associated with global expansion whereas the upstream-downstream hypothesis attributes this impact to the increased business risk associated with expanding from a more stable economy to less stable economies around the world.

Following Kowk and Reeb (2000), I measure the degree of firms' foreign operations based on the ratio of foreign assets to total assets. I collect geographic segments data from the Worldscope database for the year 2002 and decompose a firm's total assets into three components: Canadian assets, US assets and Global (non-US) assets. The percentage of a firm's US assets (US Assets%) and non-US (Global Assets%) to its total assets are used to measure the firm's US and non-US operations, respectively.

The degree of US and non-US operations varies widely in my sample. About 18% (or 109) firms are purely US focused (US Assets%>0 & Global Assets%=0); 30% (or 180) firms are purely global (non-US) oriented (US Assets%=0 & Global Assets%>0); and the remaining 51% (or 303) have both US and global exposures (US Assets%>0 & Global Assets%>0). The correlation between US Assets% and Global Assets% is very low (ρ=-0.02) and, thus, I include both variables in the regression. I test the two

hypotheses in the full sample as well as in the sub-samples of the purely global and purely US focused firms. The results are qualitatively similar in both samples. I report the results with the full sample in Table 2.5 to conserve space.

Table 2.5 column (1) shows that as a Canadian MNC increases its US operation level, its long-term debt ratio rises significantly but there is little effect on leverage as it expands its operations globally. The coefficient on US Asset% is positive (0.08) and significant (t=3.66) whereas that on Global Assets% is positive (0.01) but not significant at any level (t=0.60).

Next, I examine whether the agency costs of debt or upstream-downstream hypothesis explains the observed difference. I do this analysis by introducing the interaction variables of US Assets% and Global Assets% with M/B and RISK respectively in the regression. Column (2) shows that the coefficient on US Assets%×M/B is positive but not significant (t=0.48) whereas that on Global Assets%×M/B is negative and significant at less than 1% level (t=-3.39). This evidence supports that the negative impact of agency costs of debt on leverage is more pronounced when a Canadian MNCs expands its operations in the non-US markets relative to the US market.

Column (3) shows that the coefficient on US Assets%×RISK is positive but not significant at any conventional level (t=0.39) whereas that on Global Assets%×RISK is negative but weakly significant (t=-1.63). This evidence is consistent with the upstream-downstream hypothesis that predicts that the business risk of a Canadian MNC should

increase as it expands its operations globally (going downstream) compared to that in the US (going upstream).[13]

The agency costs of debt and upstream-downstream hypotheses, however, are not mutually exclusive. To examine which of the two effects dominates, I include all the above four interactive terms in the next regression (column (4)). The results support that the agency costs of debt is the dominant factor, because among the four interactive terms in this regression only the coefficient on Global Assets%×M/B is significant (t=-3.15). However, the coefficient on US Assets% in this regression remains positive (0.08) and significant (t=3.57). This is not surprising because Canadian MNCs' expansion in the US is likely to have little effect on both agency costs of debt and business risk because of the close geographical proximity, economic linkage, and similar accounting and disclosure requirements between Canada and the US. I next examine whether the access to the US and global bond markets can explain the higher leverage of Canadian MNCs.

2.4.2.2. International Bond Market Access Hypothesis

The international bond market access hypothesis predicts that Canadian MNCs should have higher leverage than DCs because of their enhanced ability to tap into larger and more liquid global bond markets. Faulkender and Petersen (2006) find that firms with access to the US bond market, measured by having an S&P rating, maintain significantly higher leverage ratios than their peers who do not have bond market access. Because large Canadian firms commonly issue debt in the US bond market, I measure

[13] I also use foreign sales segments data, instead of asset segments data, to test the agency costs of debt and upstream-downstream hypotheses. Similar to the result obtained from the asset segments data, I find that as a firm's US sales increase, its long-term debt ratio rises significantly (*coeff.*=3.83, t=2.07), and the long-term debt ratio is not significantly related to the firm's global sales (*coeff.*=0.02, t=0.01). The interactive terms of US Sales% and Global Sales% with M/B and RISK are not significant at any conventional level.

international bond market access with an indicator variable (BOND ACCESS) that equals one if the firm reports an S&P long-term domestic issuer credit rating and zero otherwise. To control for the impact of the higher access to the US equity market, I also use an indicator variable CROSS that equals one if a firm has cross-listed its stock on the US stock exchanges and zero otherwise.[14]

I first test whether the access to the global bond markets has a positive impact on leverage by including BOND ACCESS in addition to US Assets% and Global Assets% in the regression (column (5)). The coefficient on BOND ACCESS in this regression is positive (5.61) and significant at the 1% level (t=3.08). The result supports the view that the access to the US and global bond markets has a significant positive impact on the leverage of Canadian firms. The coefficient on BOND ACCESS becomes even larger (8.48) when I include the variable CROSS in the regression (column (6)). The coefficient on CROSS is -7.56 (t=-6.90), indicating that cross-listed Canadian firms have significantly lower leverage than non cross-listers. This result is consistent with Pagano et al. (2002) who document that European firms that cross-list on the US exchanges tend to raise more equity capital and exhibit a decrease in leverage after cross-listing compared to their peers.

Next, I examine whether the impact of international bond market access on leverage is different between Canadian MNCs' US and non-US operations by including the interactive variables of BOND ACCESS with US Assets% and Global Assets% in the next regression (column (7)). The coefficients on both these interactive variables are negative but only that on Global Assets%×BOND ACCESS is statistically significant (t=-

[14] A firm is defined as cross-listed if it has positive total assets in both the Compustat US and Canadian databases in respective year, and zero otherwise.

2.36). This evidence supports that Canadian MNCs' expansion into the global markets is associated with lower leverage even for firms with higher access to global bond markets, measured by the S&P credit rating.

Since the three hypotheses, *agency costs of debt, upstream-downstream, and international bond market access*, are not mutually exclusive, I include all the variables and their interactive terms in one regression (column (8)). The coefficients on both Global Assets%×M/B and Global Assets%×BOND ACCESS are negative and significant but that on Global Assets%×Risk is not significant in this regression. This evidence suggests that agency costs of debt is the dominant factor in explaining the lower leverage associated with the global expansion of the Canadian MNCs.

A limitation of using the S&P credit rating as a proxy for the access to the US and global bond markets is that only a small proportion of the MNCs (20%) and DCs (6%) have an S&P rating. Since most large Canadian firms have easy access to the US bond market and commonly raise debt in the US market, I also use firm size (SIZE) as a proxy for the access to the US bond market. Because a typical Canadian MNC in my sample is about three times larger than a DC, I should observe a more positive impact of firm size on leverage for the MNCs relative to the DCs. To examine whether this impact is different for the MNCs' US and non-US operations, I include the interactive terms of SIZE with US Assets% and Global Assets% in the next regression in addition to all other variables (column 9). The coefficients on both these interactive variables are positive but only the coefficient on US Assets%×SIZE is significant (t=2.70) in this regression. The results support that the access to the US bond market has a positive impact on the leverage of Canadian MNCs and this impact is larger for firms operating in the US

market. Interestingly, the coefficient on US Assets% is negative and significant whereas that on Global Assets% is insignificant in this regression, suggesting that the higher leverage associated with Canadian MNCs' US operations could arise primarily from their access to the US bond market. Since there is a high correlation between firm size and credit rating, I also redo the analysis by excluding the variable BOND ACCESS and its interactive terms from the regression. The result remains essentially the same compared to that reported in column (9) (results are not tabulated here).

2.4.2.3 Summary

I examine several plausible explanations of the higher leverage of Canadian MNCs and document several interesting findings. First, I find that the higher leverage ratio of Canadian MNCs is associated primarily with their US operations, not with their global (non-US) expansions. Second, in line with my expectation, I document that there is little impact on the agency costs of debt or on business risk as a firm expands its operations in the US. In contrast, the agency costs of debt increase substantially whereas the business risks increase only modestly as Canadian MNCs increase their global focus. Third, I also show that the access to the international bond markets has a significant impact on leverage of the MNCs, and this impact is larger for MNCs' US operations compared to the non-US operations.

2.5. The Capital Structure of MNCs: Canadian versus the US Evidence

My evidence shows that Canadian MNCs have much higher long-term debt ratios but similar short-term debt ratios compared to their domestic peers. This evidence is

opposite to that reported in the prior US studies, which show that the US MNCs exhibit lower long-term debt ratios but higher short-term debt ratios than DCs (see for example, Fatemi (1988), Burgman (1996), Chen, Cheng, He and Kim (1997) and Doukas and Pantzalis (2003)).

What factors explain these differences between Canadian and US evidence? One possibility is that the different sample characteristics between the two countries could drive the observed leverage differences. For example, 30 percent of my sample consists of resource-based firms whereas this proportion is only 6 percent in the sample used in Doukas and Panzalis (2003). Moreover, the leverage ratios could also change over time with macroeconomic conditions (Korajczyk and Levy (2003)). Additionally, it is plausible that the determinants of leverage could be different across the two countries. Several recent studies have shown that country-specific factors significantly influence firms' leverage. For example, Rajan and Zingales (1995) compare the leverage of G-7 countries and conclude that although leverage and its correlations with firm-specific factors (e.g. firm size and market-to-book value) appear to be similar across G-7 countries, the economic underpinnings of the factors could be different.

In this section, I try to minimize the sample variation between the two country samples and test whether the determinants of leverage are different in the two countries. To do this analysis, I construct a US matched sample with my Canadian sample, based on year, industry and firm size. For each Canadian MNC (DC), I match a US MNC (DC) first by year and industry, and then by as closely as possible on firm's total assets.[15] My

[15] The industries are divided into six broad sectors (see Table 2.2 for a detail classification of six sectors). Total assets are matched in the US dollars (Worldscope database also reports total assets in US dollars for Canadian firms). I also experiment to match US firms with Canadian firms based on year, two- or three-

matching method allows the controlled sample (the US observations) without replacement. I draw the US data from the Compustat database for the same time period as my Canadian sample. The match results in a total of 1,686 observations for the US sample (472 MNCs and 1,214 DCs).[16] After the matching, the firm size is very similar in the two country samples. The median total assets of the US MNCs (DCs) in the matched sample is $254.85M ($56.95M) compared to the median total asset of Canadian MNCs (DCs) of $269.71M ($54.99M).

[Insert Table 2.6 about here]

I run regression (1) for the US matched sample, and the results are reported in Table 2.6. The evidence largely supports the result in the prior US studies that the US MNCs display lower long-term ratios but higher short-term ratios than DCs. The coefficient on MNC is negative (-1.81, t=-1.49) when I use LTdebt as the dependent variable whereas it is positive (1.34, t=1.47) when I use STdebt as the dependent variable in the regression. These results confirm that the lower leverage of the US MNCs is not an artifact of the differences in industry, size characteristics, or time periods.

2.5.1. Comparison of the Determinants of Capital Structure

I next examine whether the determinants of leverage are different between Canada and the US by running separate regressions of long-term debt ratio on the firm-

digit SIC codes, and total assets. However, this approach results in a much smaller sample of the US matched MNCs compared to the one I report here.

[16] For the US firms, the Worldscope database (2004 January version) only includes those on the S&P500 index. Thus, I draw the US sample from the Compustat database as an alternative source.

specific determinants of leverage in the overall sample, as well as in the MNC and DC samples. The results are reported in Table 2.7.

[Insert Table 2.7 about here]

Several observations follow from Table 2.7. First, although the explanatory power of regressions is very similar between both countries (adj. R^2 is about 21% to 25%), the Chow tests reject the null hypothesis that the impacts of the firm-specific determinants on leverage are similar. The F-values from the Chow tests are 4.30 (Prob.>F=0.0000), 4.93 (Prob.>F=0.0000), and 2.99 (Prob.>F=0.0001) for the pooled total sample, the MNCs pooled sample, and the DCs pooled sample, respectively.[17] This evidence indicates that the sensitivity of leverage to the firm-specific variables is significantly different between the two countries.

Second, the intercept for the overall Canadian sample is larger than that of the US (-26.96 versus -37.88), which is consistent with the observation in Rajan and Zingales (1995) that Canadian firms tend to have higher leverage than the US firms.[18] Furthermore, the difference in intercept is driven primarily by the MNC samples. For example, the intercept for the Canadian MNCs is -14.00 compared to -85.10 for the US MNCs whereas the difference between the Canadian DCs and the US DCs is much smaller (-28.22 versus -29.59). This result suggests that the US MNCs tend to have lower

[17] The chow test is based on pooling the Canadian and the US matched sample. The regression allows the intercept and all slopes to be different between the two samples (see Wooldridge (2003) p.237 for a detail discussion of the model). The chow test assumes that the error variances between the two samples are the same.

[18] Rajan and Zingales (1995) report that Canadian firms, in general, have higher leverage ratios than US firms. They show that the mean (median) market-based debt to total assets ratio of Canadian firms in their sample are 27% (28%) compared to 24% (20%) for the US firms.

leverage ratios than the Canadian MNCs, after controlling for firm-specific factors.

Finally, the evidence shows that the negative impact of agency costs of debt on leverage is more pronounced for the US MNCs compared to the Canadian MNCs. For example, the coefficient on M/B is larger for MNCs compared to DCs (-0.28 versus -0.05) in the US sample. In contrast, the magnitude of M/B is similar between Canadian MNCs and DCs (-0.18 versus -0.15), and it is only significant for Canadian DCs but not for Canadian MNCs (t= -2.30 versus -1.28). The positive impact of TANGIBLE ASSET on leverage is also similar between Canadian MNCs and DCs (28.10 versus 30.27) but is smaller for the US MNCs than the US DCs (17.56 versus 28.15). These coefficients are largely consistent with the evidence of Doukas and Panzalis (2003) that the US MNCs have higher agency costs of debt than DCs. The Canadian MNCs appear to have similar or even lower agency costs of debt than their domestic peers. I also find that the negative impact of RISK on leverage is also lower for the MNCs than for the DCs in both countries. A possible explanation could be that MNCs have more diversified cash flows compared to DCs. The impacts of TANGIBLE ASSETS, SIZE and PROFIT on leverage are also consistently and significantly different between the two country samples.

I also conduct within-country analysis to test which of the firm-specific determinants can explain the leverage difference between the MNCs and DCs in each country by including an interactive term MNC×X, where X represents each individual leverage determinant in the regression (1). The results for the two countries are reported in Tables 2.8 and 2.9 respectively. For the Canadian sample, none of the interactive variables, except MNC×SIZE, is significant at any conventional level. The coefficient on SIZE is 1.80 (t=8.39) and the coefficient of MNC×SIZE is 1.00 (t=2.69). This evidence

indicates that as the size of a typical Canadian DC increases from the 25th percentile to the 75th percentile, its long-term debt ratio will increase by about 5%. By contrast, moving the size of a Canadian MNC from the 25th percentile to the 75th percentile increases the leverage ratio by 8.77%. The coefficient on MNC×M/B is not statistically significant, confirming that the impact of the agency costs of debt on leverage is similar for Canadian MNCs and DCs.

[Insert Tables 2.8 and 2.9 about here]

For the US matched sample, SIZE also has different impact on leverage for the MNCs and DCs. The coefficients on SIZE and MNC×SIZE are 3.03 (t=9.05) and 1.59 (t=2.75), respectively. Thus, moving the DCs and MNCs' firm size from the 25th percentile to the 75th percentile increases the long-term debt ratios by about 8.21% and 9.00%, respectively. In addition, PROFIT has a significantly different impact on leverage between MNCs and DCs (MNC×PROFIT=0.15, t=2.27) but its economic significance is small because increasing the US MNCs' profitability from its 25th percentile to the 75th percentile only increases the leverage ratio by 0.02%.

Overall, I conclude that while the determinants of leverage appear to provide similar explanatory power, the impacts of the firm-specific variables on leverage are substantially different between the two country samples as well as between the MNCs and DCs sub-samples. This evidence supports that at least part of the differences in the MNCs leverage between the US and Canada may reflect the differences in the determinants of leverage between the two countries.

2.6. Summary and Conclusions

This study examines the capital structure of Canadian MNCs to gain some insights into the influence of the country-specific factors on leverage. I ask three main questions: (i) Does the leverage of Canadian multinationals differ from their domestic peers? and if so, what factors drive this difference? (ii) Does the access to the US capital market influence the capital structure of Canadian firms? and if so, does it explain the leverage difference between the MNCs and DCs? and (iii) Does the capital structure of Canadian MNCs differ from the US MNCs and if so, what factors explain this difference?

My major findings are as follows. Contrary to the US evidence, I find that the Canadian MNCs display about 3 to 4 percent higher long-term debt ratios but similar short-term ratios compared to the DCs, after controlling for the firm-specific factors. However, this higher leverage is associated primarily with the MNCs' US operations; firms that expand in the global (non-US) market experience little impact on leverage. I also show that the negative impact of agency costs of debt and business risk on leverage is more pronounced for Canadian MNCs' non-US operations compared to their US operations, and the agency costs of debt is the dominant factor. Access to the international bond markets has a significant positive impact on the leverage of Canadian MNCs and this effect is larger for MNCs' US operations compared to the non-US operations. Firms with access to the global bond market, as measured by the S&P credit rating, have about 8.5% higher leverage than their peers although the effect is lower for firms expanding globally.

I also compare the Canadian MNCs and DCs sample with a US industry and size matched sample in the 1998-2002 period, and find that the US MNCs display lower long-term debt ratios and higher short-term debt ratios than their peers, consistent with the finding in prior studies. I document that the sensitivity of the firm-specific determinants of leverage commonly employed in the literature is significantly different between the two country samples. Overall, my results suggest that differences in the capital structure of Canadian and US MNCs are explained by differences in the geographic orientation of the MNCs and in the home country factors, such as size of capital markets.

This study makes several contributions to the literature. First, most of the prior research on the capital structure of multinationals has been done in the US context and shows puzzling evidence that the US multinationals have lower leverage than their domestic peers. Several explanations have been offered but there is no consensus on what factors drive this result. My study in the Canadian context provides some new insights into this puzzling evidence. In particular, the dichotomy of the Canadian MNCs' US and non-US operations provides me a unique sample to test the agency costs of debt and upstream-downstream hypotheses after controlling for the effects of the home country. Similar to the US case, I find that Canadian MNCs expanding into the global market have a more pronounced negative impact of the agency costs of debt on leverage whereas there is little effect when they venture into the US market. I also document that the positive benefits of access to the global bond market on leverage decline as the firm's global exposure increases. This result is consistent with the higher agency costs of debt because the bondholders have to devote more resources on monitoring firms that expand into global markets. I find more support for the agency costs of debt hypothesis and less for

the upstream-downstream hypothesis.

Second, this is the first study that examines the leverage impact of MNCs' expansion into regionally integrated economies versus global markets. My finding that the higher leverage of the Canadian MNCs is associated primarily with their expansion in the US rather than in global markets suggests that the main benefits for Canadian firms do not stem from the geographic diversification of their cash flows as argued in the traditional theories of multinational capital structure but instead come from enlarging their product markets in the US. The positive benefits of expansion in the US may be the result of the close economic linkages, such as the North American Free Trade agreement and the Canada-US MJDS, that provide Canadian MNCs easy access to the world's largest product and capital markets.

Finally, several recent studies have documented that country-specific factors play an important role in firms' leverage but little is known about how these factors impact leverage. My study contributes to the literature by examining the determinants of capital structure in two countries with very similar legal and institutional environment, as well as in the scope of MNCs and DCs. Overall, this study shows that the capital structure of MNCs is determined by a complex interaction of the home and host country factors as well as their expansion in regional and global markets.

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Table 2.1. Comparison of Leverage Ratios for Canadian MNCs and DCs

	All Firms (N=1,821)	Domestic Firms (N=1,229)	MNCs (N=592)	MNCs with different degrees of internationalization: FRA>0.20& FRS>0.20 (N=472)	FRA>0.40& FRS>0.40 (N=279)	FRA>0.60& FRS>0.60 (N=143)	FRA>0.80& FRS>0.80 (N=72)
TotalDebt	26.35	24.30	30.57	31.00	33.44	30.69	21.90
	[20.44]	[17.30]	[26.19]	[26.45]	[28.99]	[21.37]	[15.78]
Means [median] difference test (DCs-MNCs)							
t-test			-4.96***	-4.87***	-5.37***	-2.83***	0.93
Wilcoxon rank sum z			[-6.54]***	[-6.29]***	[-6.06]***	[-3.24]***	[-0.10]
LTdebt	18.18	15.87	22.93	23.33	25.93	25.80	17.48
	[10.80]	[7.20]	[17.20]	[17.12]	[21.38]	[15.84]	[12.08]
Means [median] difference test (DCs-MNCs)							
t-test			-6.82***	-6.49***	-6.73***	-4.66***	-0.67
Wilcoxon rank sum z			[-8.59]***	[-8.14]***	[-7.78]***	[-5.21]***	[-1.20]
STdebt	8.14	8.37	7.66	7.76	7.64	5.19	4.42
	[2.24]	[1.49]	[3.11]	[3.06]	[3.05]	[2.46]	[2.15]
Means [median] difference test (DCs-MNCs)							
t-test			1.04	0.81	0.82	4.02***	4.90***
Wilcoxon rank sum z			[-5.03]***	[-4.75]***	[-4.06]***	[-1.51]	[-0.20]

Long-term debt ratio (LTdebt) is the long-term debt over the sum of total debt and market value of equity. Short-term debt ratio (STdebt) is the sum of short-term debt and current portion of long-term debt over the sum of total debt and market value of equity. Total debt ratio (TotalDebt) is the sum of LTdebt and STdebt. TotalDebt, LTdebt and STdebt are expressed in percentage terms. A firm is defined as an MNC if it reports foreign assets and foreign sales ratios of 10% or more. A firm is defined as a DC it does not report any foreign assets and foreign sales. The degrees of internationalization are measured by both the foreign assets ratio (FRA = Foreign Assets/Total Assets) and the foreign sales ratio (FRS = Foreign Sales/Total Sales). The upper number (lower number in parentheses) in each cell reports the mean (median) value for each variable. *t*-tests (Wilcoxon rank sum z tests) are used to test the difference in mean (median) value between DCs and MNCs. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 2.2. Leverage Ratios for Canadian MNCs and DCs across Different Industries

	All Firms				Domestic Firms (DCs)				Multinationals (MNCs)				Difference Test (DCs-MNCs)		
Industries	Obs	Total Debt	LT debt	ST debt	Obs	Total Debt	LT debt	ST debt	Obs	Total Debt	LT debt	ST debt	Total Debt	LT debt	ST debt
1. Agriculture	18	45.03	26.78	18.25	13	38.95	16.96	21.99	5	60.85	52.31	8.54	-1.81*	-4.52***	1.61
		[46.96]	[22.04]	[7.02]		[37.00]	[19.62]	[6.98]		[57.12]	[51.56]	[7.05]	[-2.02]**	[-2.91]***	[0.25]
2. Resource	548	23.15	17.25	5.82	389	20.75	15.25	5.45	159	28.84	22.13	6.71	-3.85***	-3.94***	-1.08
		[20.35]	[13.87]	[0.33]		[18.09]	[10.50]	[0.00]		[26.40]	[19.92]	[2.39]	[-4.02]***	[-4.29]***	[-4.94]***
3. Construction	22	33.21	29.53	5.46	14	15.98	11.45	4.53	8	67.65	61.17	7.32	-6.84***	-7.06***	-1.44
		[17.61]	[11.33]	[4.53]		[8.77]	[3.63]	[3.48]		[69.45]	[61.93]	[7.53]	[-3.43]***	[-3.55]***	[-1.57]
4. Manufacturing	736	27.63	18.97	8.67	440	25.03	16.03	9.01	296	31.50	23.33	8.17	-3.33***	-4.58***	0.82
		[22.18]	[11.67]	[3.10]		[14.40]	[6.20]	[2.22]		[27.18]	[17.83]	[3.41]	[-4.96]***	[-6.55]***	[-2.54]**
5. Trade	193	35.23	21.69	13.54	161	35.78	21.65	14.13	32	32.47	21.93	10.55	0.67	-0.08	1.24
		[30.70]	[19.72]	[6.09]		[31.10]	[19.72]	[6.01]		[28.61]	[19.27]	[6.22]	[0.45]	[-0.36]	[-0.30]
6. Service	304	21.63	14.40	7.06	212	19.99	12.51	7.24	92	25.36	18.76	6.65	-1.52	-2.26**	0.39
		[6.92]	[1.69]	[1.07]		[3.22]	[0.60]	[0.80]		[11.68]	[8.90]	[1.84]	[-3.11]***	[-3.97]***	[-2.19]**

Long-term debt ratio (LTdebt) is the long-term debt over the sum of total debt and market value of equity. Short-term debt ratio (STdebt) is the sum of short-term debt and current portion of long-term debt over the sum of total debt and market value of equity. Total debt ratio (TotalDebt) is the sum of LTdebt and STdebt. TotalDebt, LTdebt and STdebt are expressed in percentage terms. A firm is defined as an MNC if it reports foreign assets and foreign sales ratios of 10% or more. A firm is defined as a DC if it does not report any foreign assets and foreign sales. Industry classification is based on the structure of US Department of Labor SIC Division Structure. Agriculture sector includes Agriculture, Forestry, and Fisheries (first 2-digit SIC codes from 01 to 09); Resource sector includes metal mining, coal mining, oil and gas extraction, and mining and quarrying of nonmetallic minerals, except fuels (first 2-digit SIC codes from 10 to 14); Construction sector (first 2-digit SIC codes from 15 to 17); Manufacturing sector (first 2-digit SIC codes from 20 to 39); Trade sector includes wholesale and retail trade (first 2-digit SIC codes from 50 to 59); Service sector (first 2-digit SIC codes from 70 to 89). The upper number (lower number in parentheses) in each cell reports the mean (median) value for each variable. *t*-tests (Wilcoxon rank sum z tests) are used to test the difference in mean (median) value between DCs and MNCs. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 2.3. Comparison of Firm Characteristics between Canadian MNCs and DCs

	DCs					MNCs					Difference Test (DCs-MNCs)	
	Mean	Q1	Median	Q3	Std	Mean	Q1	Median	Q3	Std	*t* test	Wilcoxon
M/B	2.77	0.89	1.45	2.44	10.55	2.55	0.87	1.50	2.69	8.59	0.46	-0.35
TANGIBLE ASSET	0.43	0.15	0.39	0.70	0.31	0.43	0.20	0.41	0.65	0.26	0.21	-0.57
NDTS	0.07	0.03	0.05	0.08	0.08	0.06	0.04	0.05	0.07	0.06	1.13	-0.34
SIZE	675.49	15.73	58.27	251.18	2315.72	1727.29	61.70	321.61	1416.25	4370.37	-5.50***	-13.72***
RISK	5.21	0.02	0.06	0.19	36.29	1.30	0.02	0.04	0.12	9.58	3.53***	3.65***
PROFIT	-6.55	-0.18	0.01	0.07	45.17	-0.99	-0.07	0.02	0.06	6.83	-4.21***	-0.92

M/B is the market value of equity divided by the book value of equity. TANGIBLE ASSET is the ratio of net plant and equipment over total assets. NDTS is the ratio of depreciation and amortization over total assets. SIZE is annual sales in $ millions. RISK is the standard deviation of cash flows divided by sales over the past five years. PROFIT is the average of net income over sales ratio over the past three years. *t*-tests (Wilcoxon rank sum z tests) are used to test the difference in mean (median) value. Q1 is the 25% percentile value. Q3 is the 75% percentile value. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 2.4. Regression Analysis for the Leverage Ratios of Canadian MNCs versus DCs

Independent Variable	Predicted Signs	Dependent Variable: LTdebt (1)	Dependent Variable: STdebt (2)
Intercept		-23.82	18.52
		(-3.91)***	(2.93)***
MNC	Research Interest	3.39	-0.23
		(3.39)***	(-0.30)
M/B	-	-0.15	-0.12
		(-2.54)**	(-1.90)*
TANGIBLE ASSET	+	29.40	2.90
		(12.81)***	(1.78)*
NDTS	-	-11.76	7.82
		(-2.47)**	(1.40)
SIZE	+	2.11	-0.14
		(11.00)***	(-1.08)
RISK	-	-0.03	0.04
		(-1.82)*	(1.09)
PROFIT	+/-	-0.04	0.04
		(-2.81)***	(1.58)
Industry Dummies		Yes	Yes
Year Dummies		Yes	Yes
N		1821	1804
Adjusted R^2		0.24	0.04
F-Value		42.50	4.21

Pooling regression result with robust standard errors (White, 1980) for the Canadian sample. LTdebt is the long-term debt over the sum of total debt and market value of equity. STdebt is the short-term debt over the sum of total debt and market value of equity. LTdebt and STdebt are expressed in percentage terms. MNC equals 1 if the firm reports foreign assets and foreign sales ratios of 10% or more, and equals 0 if it does not report any foreign assets and foreign sales data. M/B is the market value of equity divided by the book value of equity. TANGIBLE ASSET is the ratio of net plant and equipment over total assets. NDTS is the ratio of depreciation and amortization over total assets. SIZE is the natural logarithm of total sales. RISK is the standard deviation of cash flows divided by sales over the past five years. PROFIT is the average of net income over sales ratio over the past three years. Five industry dummies and four year dummies are included in the regression to control for the industry and year effects. The coefficients on those dummies are not reported in the table, but are available upon request. *t*-values are reported in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively. The predicted signs are summarized for column (1).

Table 2.5. Hypotheses Testing: Agency Costs of Debt, Upstream-Downstream, and International Bond Market Access

	Dependent Variable: LTdebt								
	Agency Costs of Debt vs. Upstream-Downstream				*Bond Market Access*			*All*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept	-24.00	-23.43	-23.69	-23.59	-18.78	-18.72	-19.49	-18.18	-12.98
	(-3.97)***	(-3.89)***	(-3.90)***	(-3.90)***	(-3.02)***	(-3.03)***	(-3.10)***	(-2.89)***	(-2.07)**
US Assets%	0.08	0.08	0.08	0.08	0.08	0.10	0.11	0.10	-0.49
	(3.66)***	(3.59)***	(3.60)***	(3.57)***	(3.89)***	(4.77)***	(4.68)***	(4.53)***	(-2.23)**
Global Assets%	0.01	0.06	0.01	0.06	0.01	0.02	0.04	0.08	-0.11
	(0.60)	(2.37)**	(0.75)	(2.38)**	(0.34)	(1.33)	(2.16)**	(3.30)***	(-0.65)
US Assets%×M/B		0.00		0.00				0.00	0.00
		(0.48)		(0.49)				(0.55)	(0.71)
Global Assets%×M/B		-0.02		-0.02				-0.02	-0.02
		(-3.39)***		(-3.15)***				(-3.36)***	(-2.77)***
US Assets%×RISK			0.00	-0.00				0.00	0.00
			(0.39)	(-0.11)				(0.35)	(1.36)
Global Assets%×RISK			-0.00	0.00				0.00	0.00
			(-1.63)	(0.77)				(0.88)	(1.27)
BOND ACCESS					5.61	8.48	11.65	11.64	12.88
					(3.08)***	(4.67)***	(4.71)***	(4.70)***	(5.17)***
CROSS						-7.56	-7.29	-7.31	-7.49
						(-6.90)***	(-6.64)***	(-6.66)***	(-6.81)***
US Assets%×BOND ACCESS							-0.04	-0.04	-0.11
							(-0.61)	(-0.56)	(-1.51)
Global Assets%×BOND ACCESS							-0.14	-0.10	-0.14
							(-2.36)**	(-1.70)*	(-1.86)*
US Assets%×SIZE									0.03
									(2.70)***
Global Assets%×SIZE									0.01
									(1.18)
M/B	-0.15	-0.15	-0.16	-0.15	-0.16	-0.15	-0.15	-0.15	-0.16
	(-2.57)***	(-2.24)**	(-2.46)**	(-2.24)**	(-2.54)**	(-2.60)***	(-2.62)***	(-2.32)**	(-2.33)**
TANGIBLE ASSET	29.74	29.52	29.80	29.48	29.36	27.99	27.46	27.33	27.56
	(12.88)***	(12.86)***	(12.89)***	(12.81)***	(12.72)***	(12.22)***	(11.90)***	(11.89)***	(12.12)***
NDTS	-11.13	-11.40	-11.30	-11.36	-10.66	-11.54	-10.85	-11.28	-11.71
	(-2.34)**	(-2.39)**	(-2.37)**	(-2.38)**	(-2.23)**	(-2.47)**	(-2.32)**	(-2.40)**	(-2.47)**
SIZE	2.09	2.06	2.07	2.07	1.73	1.87	1.87	1.79	1.47
	(11.17)***	(10.95)***	(10.89)***	(10.89)***	(8.07)***	(8.86)***	(8.78)***	(8.30)***	(6.66)***
RISK	-0.03	-0.04	-0.03	-0.04	-0.03	-0.02	-0.02	-0.03	-0.03
	(-1.86)*	(-2.74)***	(-1.86)*	(-2.78)***	(-1.94)*	(-1.49)	(-1.56)	(-2.73)***	(-2.78)***
PROFIT	-0.04	-0.05	-0.04	-0.05	-0.03	-0.03	-0.03	-0.04	-0.03
	(-2.74)***	(-4.38)***	(-2.95)***	(-4.37)***	(-2.38)**	(-2.01)**	(-2.07)**	(-3.63)***	(-3.01)***
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1821	1821	1821	1821	1821	1821	1821	1821	1821
Adjusted R^2	0.24	0.25	0.24	0.24	0.25	0.26	0.27	0.27	0.27
F-Value	40.78	37.12	37.25	33.72	38.41	38.76	34.84	30.06	28.98

Pooling regression result with robust standard errors (White, 1980) for the Canadian sample. LTdebt is the long-term debt over the sum of total debt and market value of equity, and is expressed in percentage term. US Assets% is the ratio of US assets over total assets of year 2002. Global Assets% is the ratio of non-US and non-Canadian assets over total assets of year 2002. BOND ACCESS equals 1 if it reports S&P long-term domestic issuer credit rating, and equals 0 otherwise. CROSS equals 1 if the firm is cross-listed on the US stock exchanges, and equals 0 otherwise. M/B is the market value of equity divided by the book value of equity. TANGIBLE ASSET is the ratio of net plant and equipment over total assets. NDTS is the ratio of depreciation and amortization over total assets. SIZE is the natural logarithm of total sales. RISK is the standard deviation of cash flows divided by sales over the past five years. PROFIT is the average of net income over sales ratio over the past three years. Five industry dummies and four year dummies are included in the regression to control for the industry and year effects. The coefficients on those dummies are not reported in the table, but are available upon request. *t*-values are reported in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 2.6. Regression Analysis for the Leverage Ratios of MNCs versus DCs: the US Matched Sample

Independent Variable	Predicted Signs	Dependent Variable: LTdebt	Dependent Variable: STdebt
		(1)	(2)
Intercept		-39.96	27.97
		(-5.07)***	(4.85)***
MNC	Research Interest	-1.81	1.34
		(-1.49)	(1.47)
M/B	-	-0.06	-0.04
		(-1.99)**	(-1.41)
TANGIBLE ASSET	+	26.26	2.58
		(9.56)***	(1.50)
NDTS	-	9.37	2.44
		(0.72)	(0.55)
SIZE	+	3.30	-0.87
		(10.90)***	(3.66)***
RISK	-	-0.76	-1.25
		(-1.36)	(-2.32)**
PROFIT	+/-	-0.01	-0.01
		(-7.51)***	(-4.69)***
Industry Dummies		Yes	Yes
Year Dummies		Yes	Yes
N		1686	1686
Adjusted R^2		0.21	0.02
F-Value		33.90	5.49

Pooling regression result with robust standard errors (White, 1980) for a US sample matched by year, industry, and as close as possible of total assets in US dollars with the Canadian sample. LTdebt is the long-term debt over the sum of total debt and market value of equity. STdebt is the short-term debt over the sum of total debt and market value of equity. LTdebt and STdebt are expressed in percentage terms. MNC equals 1 if the firm reports foreign assets and foreign sales ratios of 10% or more, and equals 0 if it does not report any foreign assets and foreign sales data. M/B is the market value of equity divided by the book value of equity. TANGIBLE ASSET is the ratio of net plant and equipment over total assets. NDTS is the ratio of depreciation and amortization over total assets. SIZE is the natural logarithm of total sales. RISK is the standard deviation of cash flows divided by sales over the past five years. PROFIT is the average of net income over sales ratio over the past three years. Five industry dummies and four year dummies are included in the regression to control for the industry and year effects. The coefficients on those dummies are not reported in the table, but are available upon request. *t*-values are reported in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively. The predicted signs are summarized for column (1).

Table 2.7. Cross-country Comparison on the Determinants of Long-term Debt Ratio between the Canadian Sample and the US Matched Sample

Independent Variable	Predicted Signs	Canadian Sample			US Matched Sample			Test Equality of Coefficients between Canada and US Samples		
		ALL	DCs	MNCs	ALL	DCs	MNCs	ALL	DCs	MNCs
Intercept		-26.96	-28.22	-14.00	-37.88	-29.59	-85.10			
		(-4.34)***	(-4.89)***	(-1.39)	(-4.83)***	(-2.96)***	(-6.62)***			
M/B	-	-0.14	-0.15	-0.18	-0.06	-0.05	-0.28			
		(-2.53)**	(-2.30)**	(-1.28)	(-2.00)**	(-2.00)**	(-1.97)**	(-1.00)	(-1.14)	(1.55)
TANGIBLE ASSET	+	28.88	30.27	28.10	26.63	28.15	17.56			
		(12.64)***	(10.71)***	(6.96)***	(9.69)***	(9.08)***	(2.91)***	(-3.14)***	(-2.52)**	(-2.20)**
NDTS	-	-11.85	-9.78	-20.10	9.73	5.31	72.93			
		(-2.51)**	(-1.80)*	(-1.84)*	(0.75)	(0.38)	(2.45)**	(-1.46)	(-0.93)	(-1.89)*
SIZE	+	2.35	1.71	3.09	3.15	2.90	5.25			
		(12.99)***	(7.68)***	(8.00)***	(11.00)***	(8.49)***	(7.80)***	(-2.83)***	(-3.45)***	(-3.15)***
RISK	-	-0.03	-0.03	-0.03	-0.77	-1.12	3.02			
		(-1.80)*	(-2.07)**	(-0.50)	(-1.38)	(-2.00)**	(1.07)	(2.04)**	(3.20)***	(-0.44)
PROFIT	+/-	-0.04	-0.04	-0.17	-0.01	-0.01	0.17			
		(-2.97)***	(-2.48)**	(-1.46)	(-7.57)***	(-6.33)***	(1.54)	(-2.41)**	(-2.27)**	(-2.62)***
Industry Dummies		Yes	Yes	Yes	Yes	Yes	Yes			
Year Dummies		Yes	Yes	Yes	Yes	Yes	Yes			
N		1821	1229	592	1686	1214	472			
Adjusted R^2		0.24	0.23	0.24	0.25	0.21	0.24			
F-Value		43.76	26.97	60.59	36.09	27.37	14.96			

Pooling regression result with robust standard errors (White, 1980) for the Canadian sample and the US matched sample based by year, industry, and as close as possible of total assets. Long-term Debt Ratio is the long-term debt over the sum of total debt and market value of equity, and is expressed in a percentage term. M/B is the market value of equity divided by the book value of equity. TANGIBLE ASSET is the ratio of net plant and equipment over total assets. NDTS is the ratio of depreciation and amortization over total assets. SIZE is the natural logarithm of total sales. RISK is the standard deviation of cash flows divided by sales over the past five years. PROFIT is the average of net income over sales ratio over the past three years. Five industry dummies and four year dummies are included in the regression to control for the industry and year effects. The coefficients on those dummies are not reported in the table, but are available upon request. *t*-values are reported in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 2.8. Within-Country Analysis for the Canadian Sample: Different Impact of Individual Determinant on LTdebt between MNCs and DCs

Independent Variable	Dependent Variable: LTdebt					
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-23.88	-23.65	-24.00	-18.36	-23.77	-23.82
	(-3.92)***	(-3.88)***	(-3.96)***	(-2.92)***	(-3.88)***	(-3.89)***
MNC×M/B	-0.05					
	(-0.31)					
MNC×TANGIBLE		3.01				
		(0.92)				
MNC×NDTS			-14.36			
			(-1.18)			
MNC×SIZE				1.00		
				(2.69)***		
MNC×RISK					-0.01	
					(-0.22)	
MNC×PROFIT						-0.00
						(-0.01)
MNC	3.51	2.08	4.34	-15.45	3.41	3.39
	(3.25)***	(1.25)	(3.30)***	(-2.23)**	(3.35)***	(3.32)***
M/B	-0.14	-0.15	-0.15	-0.15	-0.15	-0.15
	(-2.34)**	(-2.52)**	(-2.52)**	(-2.55)**	(-2.52)**	(-2.52)**
TANGIBLE ASSET	29.34	28.66	29.31	29.66	29.39	29.40
	(12.77)***	(11.79)***	(12.75)***	(12.97)***	(12.80)***	(12.80)***
NDTS	-11.58	-11.62	-8.58	-11.66	-11.75	-11.76
	(-2.43)**	(-2.44)**	(-1.64)	(-2.44)**	(-2.47)**	(-2.47)**
SIZE	2.11	2.12	2.11	1.80	2.10	2.11
	(11.02)***	(11.09)***	(11.00)***	(8.39)***	(10.86)***	(10.82)***
RISK	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(-1.77)*	(-1.85)*	(-1.82)*	(-1.68)*	(-1.73)*	(-1.82)*
PROFIT	-0.04	-0.04	-0.04	-0.03	-0.04	-0.04
	(-2.76)***	(-2.87)***	(-2.82)***	(-2.27)**	(-2.71)***	(-2.80)***
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	1821	1821	1821	1821	1821	1821
Adjusted R^2	0.24	0.24	0.24	0.24	0.24	0.24
F-Value	40.12	40.18	40.09	41.40	40.00	39.97

Pooling regression result with robust standard errors (White, 1980) for the Canadian sample. MNC×X is the interactive term of MNC dummy times each individual explanatory variable. LTdebt is the long-term debt over the sum of total debt and market value of equity, and is expressed in a percentage term. MNC equals 1 if the firm reports foreign assets and foreign sales ratios of 10% or more, and equals 0 if it does not report any foreign assets and foreign sales data. M/B is the market value of equity divided by the book value of equity. TANGIBLE ASSET is the ratio of net plant and equipment over total assets. NDTS is the ratio of depreciation and amortization over total assets. SIZE is the natural logarithm of total sales. RISK is the standard deviation of cash flows divided by sales over the past five years. PROFIT is the average of net income over sales ratio over the past three years. Five industry dummies and four year dummies are included in the regression to control for the industry and year effects. The coefficients on those dummies are not reported in the table, but are available upon request. *t*-values are reported in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 2.9. Within-Country Analysis for the US Matched Sample: Different Impact of Individual Determinant on LTdebt between MNCs and DCs

Independent Variable	Dependent Variable: LTdebt					
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-39.74	-39.75	-39.99	-34.28	-40.26	-39.81
	(-5.04)***	(-5.06)***	(-5.08)***	(-4.08)***	(-5.07)***	(-5.04)***
MNC×M/B	-0.28					
	(-1.46)					
MNC×TANGIBLE		9.16				
		(1.57)				
MNC×NDTS			48.69			
			(1.42)			
MNC×SIZE				1.59		
				(2.75)***		
MNC×RISK					1.44	
					(0.61)	
MNC×PROFIT						0.15
						(2.27)**
MNC	-1.01	-4.42	-4.56	-31.48	-2.13	-1.72
	(-0.74)	(-2.45)**	(-2.15)**	(-3.00)***	(-1.62)	(-1.41)
M/B	-0.05	-0.06	-0.06	-0.06	-0.06	-0.06
	(-2.10)**	(-2.01)**	(-1.97)**	(-2.00)**	(-2.00)**	(-1.99)**
TANGIBLE ASSET	26.38	24.62	25.78	26.46	26.20	26.35
	(9.59)***	(8.24)***	(9.35)***	(9.65)***	(9.52)***	(9.57)***
NDTS	9.28	9.24	6.34	9.63	9.51	9.16
	(0.71)	(0.71)	(0.45)	(0.75)	(0.73)	(0.70)
SIZE	3.28	3.33	3.34	3.03	3.32	3.29
	(10.82)***	(10.96)***	(10.92)***	(9.05)***	(10.81)***	(10.84)***
RISK	-0.75	-0.83	-0.73	-0.80	-0.87	-0.71
	(-1.36)	(-1.51)	(-1.33)	(-1.45)	(-1.57)	(-1.27)
PROFIT	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
	(-7.54)***	(-7.66)***	(-7.42)***	(-6.99)***	(-7.58)***	(-6.98)***
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	1686	1686	1686	1686	1686	1686
Adjusted R^2	0.21	0.21	0.21	0.21	0.21	0.21
F-Value	31.95	32.15	32.16	34.01	31.76	32.29

Pooling regression result with robust standard errors (White, 1980) for a US sample matched by year, industry, and as close as possible of total assets in US dollars with the Canadian sample. MNC×X is the interactive term of MNC dummy times each individual explanatory variable. LTdebt is the long-term debt over the sum of total debt and market value of equity, and is expressed in a percentage term. MNC equals 1 if the firm reports foreign assets and foreign sales ratios of 10% or more, and equals 0 if it does not report any foreign assets and foreign sales data. M/B is the market value of equity divided by the book value of equity. TANGIBLE ASSET is the ratio of net plant and equipment over total assets. NDTS is the ratio of depreciation and amortization over total assets. SIZE is the natural logarithm of total sales. RISK is the standard deviation of cash flows divided by sales over the past five years. PROFIT is the average of net income over sales ratio over the past three years. Five industry dummies and four year dummies are included in the regression to control for the industry and year effects. The coefficients on those dummies are not reported in the table, but are available upon request. *t*-values are reported in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 2.A1. Variable Definitions and Predicted Signs with Leverage

Variables	Definition	Predicted sign
Leverage Ratios		
Long-term debt ratio (LTdebt)	Long-term debt / (total debt + market value of equity)	
Short-term debt ratio (STdebt)	(Short-term debt + current portion of long-term debt)/ (total debt + market value of equity)	
Total debt ratio (TotalDebt)	LTdebt+STdebt	
Factors in Hypotheses Testing		
Multinational dummy (MNC)	MNC=1 if foreign assets and foreign sales ratios>10%; MNC=0 if no foreign assets and foreign sales	Research Interest
Foreign sales percentage(FRS)	Percentage of foreign sales over total sales	
Foreign assets percentage(FRA)	Percentage of foreign assets over total assets	
US Assets%	US assets / total assets Source: Worldscope year 2002 geographic segments file	+
Global Assets%	Non-US and Non-Canadian assets / total assets Source: Worldscope year 2002 geographic segments file	-
Bond Market Access Dummy (BOND ACCESS)	=1 if it reports S&P LT Domestic Issuer Credit Rating; 0 otherwise, Source: Compustat	+
Cross-listing Dummy (CROSS)	=1 if it is cross-listed on the US exchanges; 0 otherwise, Source: Compustat	-
Firm-specific Factors		
Agency costs of debt (M/B)	Market value of equity / book value of equity	-
Non-debt tax shields (NDTS)	Depreciation and amortization / Total assets	-
Asset tangibility (TANGIBLE ASSET)	Net plant and equipment / Total assets	+
Firm size (SIZE)	Log (total sales)	+
Cash flow volatility (RISK)	Standard deviation of (cash flows/sales) over the past five years	-
Profitability (PROFIT)	Average of (net income/sales) over the past three years	+/

Note: All data are from Worldscope January 2004 disk unless specified otherwise.

CHAPTER 3

BOND MARKET ACCESS, CREDIT QUALITY AND CAPITAL STRUCTURE

Abstract

I examine the impact of supply-side effects on capital structure in a sample of Canadian firms from 1990 to 2003. I find that firms with bond market access, as measured by having a credit rating, have substantially higher leverage than firms without access, after controlling for other determinants of leverage. The impact of bond market access is driven largely by firms with low credit quality (non-investment grade). I find a very similar leverage ratio between high credit quality (investment grade) firms and firms without access, whereas the leverage difference is more than 170% higher for low credit quality firms compared to firms without access. This finding can be attributed partly to the higher marginal impact of access to the US bond market for Canadian low credit quality firms that face severe supply-side constraints in the Canadian corporate bond market. My results support Faulkender and Petersen's (2006) finding that the supply-side constraint is a significant determinant of capital structure but also suggests that the impact is likely to vary across firms with different credit quality and across countries based on the characteristics of the domestic bond market and access to the international bond markets.

JEL Classification: G32
Keywords: Capital Structure, Bond Market, Credit Quality, Canada

3.1. Introduction

The traditional capital structure literature focuses largely on the demand-side effects of capital raising, implicitly assuming that the supply-side constraints have little effect on capital structure. For example, the trade-off theory postulates that each firm decides its optimal capital structure based on a comparison of its costs versus the benefits of debt, such as potential tax advantage and costs of financial distress. In a recent study, Faulkender and Petersen (2006) analyze whether supply-side effects influence firms' leverage by examining the relation between firms' capital structure and their access to public bond markets. They argue that firms with access to the public bond markets should have higher leverage than firms without access because of the relatively lower cost of debt and more availability of funds in the public versus private bond markets. Consistent with this hypothesis, they find that US firms with access to the public bond market, as measured by having a credit rating, have 35 percent more debt than firms without access, after controlling for firm characteristics that determine the observed capital structure, and instrumenting for the possible endogeneity of having a credit rating.

The impact of bond market access on leverage is, however, likely to differ across countries based on the development of domestic bond market and access to the international bond markets. Further, unlike the US that has the world's largest and deepest public bond markets in both high credit quality (investment grade) and low credit quality (speculative grade) bonds, most countries have small and illiquid markets comprised largely of high quality bonds. Therefore, the severity of supply-side constraint and, consequently, the impact of bond market access on leverage are also likely to be different for high and low credit quality firms. In this study, I examine these issues in a

sample of Canadian firms in the 1990-2003 period. I ask two questions: (i) Do firms with bond market access, as measured by having a credit rating, have higher leverage than firms without access? (ii) Does the impact of bond market access on leverage differ between high and low credit quality firms?

The Canadian corporate bond market has three distinct features that provide a unique dataset to examine these issues. First, Canada and the US share many similarities in their corporate bond markets because of the strong linkage of economies and proximity between the two countries. For example, similar to the US, Canadian non-financial firms are large users of bond markets. This suggests that having access to bond market should have similar financial implications for the US and Canadian firms. Thus, the Canadian sample provides an independent sample to test whether the significant impact of the supply-side effects on leverage observed in the US case also holds for a non-US sample.

Second, the Canadian corporate bond market is comprised primarily of investment grade bonds, and the domestic high-yield market is very small. The majority of corporate bonds (over 90 percent in 1998) are held by a few large institutional investors, most of whom are restricted from investing in lower-rated corporate bonds because of constraints imposed by either regulators or governing prospectuses. Moreover, the lack of credit risk analysis and the low liquidity of the domestic bond market also limit the development of a Canadian high-yield market. Thus, supply–side constraints are likely to be more severe for Canadian firms with low credit quality compared to their high quality peers. This difference allows me to examine whether the impact of such supply-side effects differs across firms with different credit quality.

Finally, despite the small size and low liquidity of the Canadian domestic bond market, Canadian firms have historically had easy access to the larger, deeper, and more liquid US bond market. Data shows that about half of Canadian bond issues are denominated in US dollars and the average size of US-dollar-denominated bond issues is twice the size of Canadian-dollar-denominated bond issues. Canadian low credit quality borrowers especially benefit from the US high-yield market and most Canadian non-investment grade bonds are issued in the US. This dichotomy thus provides a natural experiment to test the impact of access to the US bond market on leverage for the high and low quality firms.

Overall, I expect a positive impact of bond market access on leverage for Canadian firms. The marginal impact of bond market access on leverage is, however, likely to be stronger for low credit quality firms relative to their high quality peers. This postulation is based on a number of reasons. First, compared to high credit quality firms that can access both the Canadian and US bond markets, Canadian low credit quality firms are more constrained in where they can issue bonds. Second, low credit quality firms are more credit constrained and rely largely on bank loans and private placements. High-yield bonds provide financial flexibility for fast-growing firms as they protect firms against the increased costs associated with restrictive bank debt covenants in the event of deteriorated prospects (Gilson and Warner (1997)). Finally, high credit quality firms may not aggressively increase debt level because doing so may lower their credit ratings and, consequently, increases the cost of debt and affects the future availability of funds (see for example, Kisgen (2005a)).

I conduct the analysis in two dimensions. First, similar to Faulkender and Petersen (2006), I test the impact of supply-side effects on leverage by comparing the leverage difference between Canadian firms with and without bond market access. My evidence supports the prediction in Faulkender and Petersen (2006) that supply-side constraints significantly affect leverage. On average, Canadian firms with bond market access have 5.6% (5.9%) higher market (book) debt ratio than firms without access, all else being equal. This result is also robust to different model specifications and holds in a sub-sample of firms that are matched by year, industry, and firm size between firms with and without bond market access. The result also holds after I control for the endogenity in the credit rating dummy. Second, I differentiate the impact of bond market access on leverage between firms with high and low credit quality. I find that the significant impact of bond market access on leverage is largely driven by the low credit quality firms. My evidence shows that the impact of bond market access on leverage for low credit quality firms is almost five times that for high credit quality firms (9.7% versus 2.0%).

The remainder of Chapter 3 is organized as follows. In Section 3.2, I review and summarize the previous theoretical and empirical research. In Section 3.3, I describe the sample and the data. Section 3.4 includes the empirical tests. Section 3.5 discusses the conclusions.

3.2. Canadian Bond Market and Testable Hypotheses

In this section, I first discuss the main features of the Canadian corporate bond market. Then I develop testable hypotheses on the relation between bond market access and capital structure for firms with different credit quality.

3.2.1. Main Features of the Canadian Corporate Bond Market

Over the last decade, the Canadian corporate bond market has grown rapidly, due to reduced federal government borrowing, low inflation rate, low long-term interest rates, as well as the increased holdings of mutual funds. In 1998, for the first time since 1973, the net new issues of Canadian corporate bonds exceeded government bonds. Canadian corporate bonds now account for about 23 percent of the Canadian-dollar-denominated bond market (Hendry and King (2004)). In the following, I discuss three main characteristics of the Canadian corporate bond market.

First, although the size of the Canadian corporate bond market is much smaller than the US market (share of the total global corporate bond market is 3% for Canada and 49% for the US in December 2002), the strong linkage of financial markets and proximity between US and Canada has contributed to the fact that the two countries share many similarities in their corporate bond markets. For example, Canadian non-financial firms are large users of bond markets. In 1998, they account for about 55% of new issues in the domestic corporate bond market, similar to that of the US (48%). In contrast, financial institutions in many European countries have long dominated those corporate bond markets and mainly serve as wholesalers of funds to non-financial firms (Miville and Bernier (1999)). Moreover, many Canadian firms receive multiple credit ratings from Canadian and US bond rating agencies. For example, some Canadian firms have ratings from domestic rating agencies such as Canadian Bond Rating Service (CBRS) and

Dominion Bond Rating Service (DBRS), and also from US agencies such as Standard and Poor's (S&P) and Moody's.[19]

Second, the Canadian corporate bond market is comprised primarily of firms that are well-known and have credit ratings of single A or above. The domestic high-yield market is very small and only accounts for 3% or less of annual corporate bond issuance in Canada (Freedman and Engert (2003)). A few large institutional investors dominate the Canadian bond market, and most of them are restricted from investing in lower-rated corporate bonds because of constraints imposed by regulators or internal investment guidelines. In addition, most of these institutional investors follow a buy-and-hold investment strategy and private placements of issues with dealers, banks, insurance companies, and pension funds are common. As a result, secondary market trading of corporate bonds is very thin for all Canadian corporate bonds and liquidity is particularly low for high-yield bonds.

Third, the small size and low liquidity of the Canadian domestic bond market do not limit Canadian firms from tapping international bond markets. The strong linkage of financial markets between the US and Canada allows Canadian firms to have easy access to the larger, deeper, and more liquid US bond market. In 1991, Canada and the US implemented a unique Multijurisdictional Disclosure System (MJDS) that allows eligible Canadian issuers to make cross-border security offerings in the US using mostly Canadian disclosure documents. Issuers with investment grade debt and preferred shares could rely entirely on Canadian disclosures whereas the non-investment grade issuers had to reconcile their statements to US GAAP. Moreover, Canadian firms did not have to be cross-listed on the US exchanges to use the MJDS. In 1993, the eligibility of the MJDS

[19] The S&P acquired the CBRS in year 2000 and afterwards the S&P ratings replaced the CBRS ratings.

was expanded by lowering the eligibility criteria and recognizing the bond ratings by Canadian bond rating agencies. Further, the Canadian disclosure requirements were amended to increase harmonization with US requirements, making it easier for Canadian firms to access the US markets. As a result, the number and the amount of US dollar bond issuance by Canadian firms increased steadily over the 1990s, and formed approximately 50 percent of the Canadian bond markets.

Access to the US bond market benefits Canadian firms in a number of ways. First, the large number of asset managers and the pool of available funds in the US draw many Canadian firms to raise a large amount of funds in the US market. On average, the size of US-dollar-denominated Canadian bond issues is about twice that of the Canadian-dollar-denominated bond issues (Andersen, Parker, and Spence (2003)). The better market liquidity and the availability of longer term to maturity in the US market are also very attractive to Canadian issuers. Second, by raising funds in US dollars, Canadian companies are able to naturally hedge the foreign exchange risk embedded in their US-dollar-denominated cash flows. For instance, Canadian resource firms regularly issue bonds in the US to hedge against the volatility of commodity prices. Third, the US' well developed high-yield market and its availability of comprehensive credit risk analysis particularly benefit firms with weaker credit ratings. In recent years, Canadian high-yield issuers account about 40 to 50 percent of the value of the US dollar debt issued by Canadian firms (Andersen, Parker, and Spence (2003)). Thus, tapping into the US high-yield market provides Canadian low credit quality firms with additional sources of external finance, instead of relying on bank loans or private placement.

3.2.2 Testable Hypotheses

3.2.2.1 Bond Market Access and Capital Structure

Access to the bond market could influence the firm's capital structure decision because it could lower the firm's cost of debt, and make the firm less vulnerable to credit rationing and adverse macroeconomic conditions by providing additional channels of financing.

The Cost of Public versus Private Debt. The extant literature on the choice of lenders suggests that a firm's decision to borrow from public, bank or other private sources depends on the trade-off between the benefits and costs of those alternative financing sources. There is a general consensus in the literature that banks have an information advantage over other lenders in monitoring the firm (see for example, Leland and Pyle (1977), Fama (1985), Diamond (1991), among others). For example, Hadlock and James (2002) study firms' marginal financing choices in a sample of 500 firms, and find that banks can accurately price a firm's claims and reduce adverse selection problems, inducing a preference among firms that are undervalued by the market to choose bank financing. Chemmanur and Fulghieri (1994) develop a model that emphasizes the flexibility of renegotiating the debt contract as an advantage of bank debt over public debt. They predict that firms with higher probability of bankruptcy will borrow from the bank whereas firms with lower probability of bankruptcy will issue bonds. In sum, the literature suggests that small, risky and high growth firms with more information asymmetry problems tend to choose bank debt over the public bond market whereas firms that are large, more mature and have fewer growth prospects are more likely to borrow from the public bond market (see for example, Faulkender (2005),

Petersen and Rajan (1994)).[20] However, even though banks offer some benefits as mentioned above, the costs of bank debt could be substantially higher than that of the public bond market because of the higher costs of active monitoring, information collecting, contracting and sub-optimal liquation (Cantillo and Wright (2000)). These costs will be borne by the borrowers and, consequently, firms that depend solely on bank debt or other forms of private debt are likely to maintain a lower leverage level than those that have access to the public bond market.[21]

Credit Rationing. Firms that have access to the public bond market are also less likely to be affected by credit rationing. In a classical paper, Stiglitz and Weiss (1981) argue that borrowers may not be able to borrow the amount that they demand even if they are willing to pay a higher interest rate. The reason is that the increase in the interest rate may endogenously cause an increase in the total riskiness of banks' loan portfolios due to adverse selection (high-risk borrowers are willing to pay high interest rates), and adverse incentive (high interest rates induce the firm to take more risky projects) effects. In addition, firms that have access to the public bond market will be less vulnerable to the shocks caused by the changes in macroeconomic conditions. Kashyap, Lamont and Stein (1994) suggest that "credit crunch" can significantly affect a firm's operation. They argue that a tight monetary policy will lead to a lower supply of loans ("bank lending" theory) and a decline in collateral value ("collateral" theory), which further causes an increase in the cost of loans. Their evidence shows that the inventory investment of firms without

[20] Carpenter and Petersen (2002) suggest that debt financing could be very expensive for small firms. They examine a sample of US high-tech firms during the 1991-1998 period and find that most of the small firms use very little debt financing. Instead, small firms raise a large amount of funds in IPO, and after going public small firms no longer use external financing and largely use retained earnings to fund their investments.

[21] Access to the bond market could also lower firms' cost of debt by increasing their bargaining power with the banks.

public bond market access was significantly liquid-constrained during the 1981-82 recessions.

Faulkender and Petersen (2006) emphasize that the observed level of debt is jointly determined by the supply of debt and firms' demand for debt, both of which are impacted by the price of debt capital and supply and demand factors. They predict that firms with bond market access, in contrast to firms without access, should have higher leverage because lenders are willing to provide more funds (quantity channel) or they can access a cheaper source of capital (price channel). Faulkender and Petersen (2006) test this hypothesis for a sample of US firms in the 1986-2000 period. They use credit rating as a proxy for bond market access, because very few firms without (with) a credit rating have (do not have) public debt. They find strong support for this hypothesis and show that the debt ratio for firms with a credit rating is 35% higher than firms without a rating, after controlling for the leverage demand-side factors as well as the endogeneity in obtaining credit rating.

As discussed above, although the Canadian corporate bond market is smaller and less liquid than the US market, Canadian firms have easy access to the US bond market and raise about 50 percent of their debt in the US market. Thus, if supply constrains capital structure, I should see higher leverage for firms with bond market access than for firms without access. Further, since the Canadian bond markets have similar institutional structure and follow similar business practices as the US, having a credit rating should be also a good proxy for access to bond markets for Canadian firms. Based on the above arguments, I examine the following testable hypothesis for Canadian firms:

H1: *Firms that have bond market access (having a credit rating) should have higher leverage than firms without access, all else being equal.*

3.2.2.2 Credit Quality and Capital Structure

Firms with different credit ratings are likely to face different financing opportunities and cost of debt in the bond market. Credit rating is also a signal of a firm's quality and, the higher the credit quality, the lower the risk and, thus, the lower the required cost of debt. Higher quality firms are also likely to follow more conservative debt policies because aggressively increasing debt level could jeopardize their credit ratings and the future availability of funds.

The Effect of Regulation. Institutional investors largely dominate the public bond market. Due to the investment regulations, some institutional investors, particularly banks, pension funds and life insurance companies, are restricted from investing in speculative grade bonds. According to the criteria set by credit rating agencies, firms that have access to bond market can be further divided into two broad groups - high credit quality (or investment grade) firms and low credit quality (or speculative grade) firms. For example, Standard and Poor's (S&P) defines firms with credit ratings of BBB or above as investment grade and those with BB or below as speculative grade. If a bond rating drops below BBB, many institutional investors must sell the bond from their portfolio because of the constraints imposed by either regulators, or governing prospectuses, or their internal investment guidelines. Thus, the regulation requirement effectively segments the bond markets into high and low credit quality segments with a relatively higher demand for the investment grade bonds, and it implies that the demand

for speculative bonds is lower than that for the investment grade bonds, all else being equal.

Financial Flexibility. Firms that issue speculative grade bonds could be motivated by the desire to maintain financial flexibility. Gilson and Warner (1997) argue that speculative bonds, in contrast to the bank loans, have several substantial advantages, including less restrictive covenants, less secured and longer maturities. They examine a sample of firms that issued speculative bonds to pay down bank loans, holding the total amount of firms' debt as constant. Their results show that firms issue speculative grade debt to pay down bank debt after a decline in operating performance. This activity protects the firm against the increased costs associated with bank debt covenants and thus helps maintain their financial flexibility.

Managerial Concern. Several managerial surveys on capital structure report that maintaining credit rating is ranked as one of the top considerations in firms' debt policy (Graham and Harvey (2001) and Bancel and Mittoo (2004)). For example, Graham and Harvey (2001) report that 57% of CFOs view credit rating as the second most important factor that affects firms' debt policy, with financial flexibility as the most important determinant.

Kisgen (2005a) suggests that credit ratings impose some discrete costs (benefits) on a firm's capital structure decision, in addition to the traditional implications of the trade-off and pecking order theories. He argues that managers are concerned about these discrete costs (benefits) because credit ratings could significantly impact a firm's cost of capital, market perceptions of the firm's quality, and even its daily business operations. In particular, management will cautiously balance the costs and benefits of debt to choose

an optimal leverage level when a firm is at the edge of being upgraded or downgraded of certain credit ratings. He finds that firms near a credit rating change will issue less debt relative to equity than firms that are not near a rating change. He also finds that management appears to be more concerned about the rating changes from investment to speculative grade. In a follow-up study, Kisgen (2005b) further shows that recently downgraded firms tend to issue less debt relative to equity in order to regain the benefits of higher ratings.

In summary, the impact of bond market access on leverage is likely to be different for high and low credit quality firms for several reasons. On the one hand, the investment regulation that restricts some institutional investors from investing in low credit quality firms could lead to a relatively lower supply of capital and, thus, a weaker impact on leverage for such firms compared to their high quality peers. On the other hand, firms with a speculative grade bond rating may raise a significantly large amount of debt in public bond markets because of more severe supply-side constraints, and less concern about maintaining credit ratings compared to high credit quality firms. Which effect dominates is an empirical issue.

As discussed above, having a credit rating provides Canadian firms with easy access to the world's largest and most liquid US corporate bond market. The Canadian corporate bond market is comprised largely of investment grade bonds and high credit quality firms have an option to issue bonds in the Canadian or US bond market. In contrast, the low credit quality firms have no choice but to access the US high yield bond market because there is virtually no such market in Canada. Thus, low credit quality firms are also likely to have more severe credit constraints, and the marginal impact of

access to the US bond market is likely to be stronger for the low quality firms. I test the following hypothesis:

H2: The impact of bond market access on leverage (having a credit rating) should be higher for low credit quality firms than for high credit quality firms, all else being equal.

3.3. Data and Sample Description

3.3.1. Data

My initial sample is comprised of all Canadian firms that have data available in the Compustat Canadian data file from 1990 to 2003. I exclude financial and utility firms with primary SIC codes ranging between 4000-4999 and 6000-6999. I also require that, to be included in the final sample, the firm's total assets and common shares outstanding must be greater than zero, and that it must have complete data available for all the firm-specific variables used in the regression analysis. With all these restrictions, I am left with panel data of 5,176 firm-year observations for the empirical analysis.

Similar to Faulkender and Petersen (2006), I use whether a firm has an S&P long-term credit rating as a proxy for bond market access. However, since S&P is a global rating agency and its rating may not cover all Canadian firms that have public debt outstanding, I also collect annual credit rating information from a Canadian source – Dominion Bond Rating Services (DBRS) to complement the S&P rating.[22] For firms with both ratings, I use the S&P rating information. If a firm is not covered by the S&P but is

[22] The DBRS is an independent full-service Canadian rating agency established in 1976. I find that all firms with the DBRS ratings have bonds outstanding. I also find that the DBRS covers some firms that are not rated by S&P. For instance, conditional on the firm having an S&P or DBRS rating, 37.8% (274/724) observations are covered by both rating agencies; 35.6% (258/724) observations are covered by S&P but not by the DBRS; the remaining 26.6% (192/724) observations are covered by the DBRS but not by S&P.

rated by the DBRS, I use the DBRS's rating information. Based on this criteria, 724 (or 14%) firm-year observations in my sample have access to the bond market. This number varies across years - ranging from a low of 24 in the year 1990 to a high of 73 in the year 2001. The percentage of Canadian firms with bond market access is comparable to the US firms reported in Faulkender and Petersen (2006) and shows that public debt is not a major source of capital, even for most public firms in both the US and Canada.

I further divide firms with bond market access into two groups: high credit quality and low credit quality. A firm is defined as a high credit quality firm if its S&P (or DBRS) long-term credit rating is BBB or above, and is defined as a low credit quality firm if its S&P (or DBRS) long-term credit rating is BB or below. My data shows that, conditional on the firm having an S&P or DBRS rating, 70% of firms have high credit quality. These data are consistent with the general view that the Canadian bond market is dominated by firms with investment grade rating. Across years, the number of firms with low credit quality increases significantly over time. For instance, the number of low credit quality firms increases from a low of 2 in 1990 to 28 in 2003. In contrast, the number of firms with high credit quality doubles during this time period (increases from 22 in year 1990 to 43 in year 2003).

3.3.2. Leverage, Bond Market Access and Credit Quality

Table 3.1 compares the leverage difference between firms with and without bond market access, and between firms with high and low credit quality. The leverage ratios are reported on market and book value bases. The market debt ratio is defined as the ratio of long-term debt over the sum of total debt and the market value of equity. The book

debt ratio is defined as the ratio of long-term debt over the sum of total debt and the book value of equity. The book debt ratio is truncated between zero and one.

[Insert Table 3.1 about here]

Table 3.1 shows that firms with bond market access have significantly higher leverage than their peers (23.20% versus 11.87% using market value, $p<0.01$). This pattern holds for both the market and book debt ratios, and is also consistent across the whole distribution (e.g. the 25th, 50th and 75th percentiles). The average leverage differences between the two groups of firms are 11.33% (market debt ratio) and 13.32% (book debt ratio), and are significant at the 1% level. Thus, having a credit rating increases the firm's market and book debt ratios by 95 percent ((23.20%-11.87%)/11.87%) and 91 percent ((27.93%-14.61%)%/14.61%), respectively.

I next examine whether the significant leverage difference between firms with and without bond market access is driven by low or high credit quality firms. The comparison shows that the low credit quality firms have much higher leverage than their high quality peers. For instance, low credit quality firms have almost 190 percent higher leverage ((34.41%-11.87%)/11.87%) than firms without bond market access based on market value, whereas this difference is only 54 percent ((18.30%-11.87%)/11.87%) for high quality firms. The results hold for the book value ratios. Some of this difference could be explained by the differences in firm or industry characteristics. I examine this next.

3.3.3. Comparison of Industry and Firm Characteristics

Table 3.2 compares the leverage ratios across industries based on the primary SIC codes. My sample is comprised of five broad sectors - Resource, Manufacturing, Wholesale and Retail, Service, and Public but the majority of the firms belong to the Manufacturing (47%) and Resource (27%) sectors. The result that firms with bond market access have significantly higher debt ratios than firms without such access holds across all sectors, although the magnitude of the difference between the two groups varies across sectors. For example, based on the market value, resource firms with a credit rating have 49% ((17.12%-11.51%)/11.51%) higher debt ratio than firms without a rating whereas this difference is 94% ((23.65%-12.17%)/12.17%) for the manufacturing firms.

Low credit quality firms also have higher leverage than high quality firms across all sectors but the difference varies across sectors. The firms in Resource sector exhibit the lowest and those in the Service sector have the highest difference among all groups. Independent of the leverage measure, the difference is statistically significant at the 1% level for the Manufacturing firms that represent over 65 percent of the low quality firms.

[Insert Tables 3.2 and 3.3 about here]

Leverage ratios are also likely to depend on firm-specific factors. For example, the traditional capital structure literature suggests that large firms with a higher tangible asset ratio tend to have higher leverage (see for example, Harris and Raviv (1991)). Table 3.3 shows that firms with bond market access are significantly different from those without access on several dimensions. The most significant difference is in firm size. The mean (median) size of firms with bond market access is $5036.26M ($2902.92M), which

is more than 14 (28) times larger than the firms without bond market access ($347.88M ($100.59M), $p<0.01$). The firms with a credit rating also have more tangible assets (54.4 percent versus 36.5 percent of book assets), are more profitable (14.7 percent of EBITDA on book assets versus 8.5 percent), and have lower cash flow volatility (2.4 percent standard deviation based on last three years versus 5.0 percent) than firms without a credit rating. They are also low growth firms irrespective of whether growth opportunities are measured in terms of Market-to-book ratio, R&D investment, or Sales growth rate.

The high credit quality firms also differ from low quality firms in several firm characteristics: they are substantially larger, have a larger fraction of tangible assets, higher profitability, and lower cash flow volatility than their peers. These differences suggest that high quality firms should have higher demand for debt than low credit quality firms whereas I observe the opposite. Overall, these differences suggest that I need to control for the demand-side effects to draw meaningful conclusions about the supply-side effects on capital structure based on credit quality. I do this analysis in the next section.

3.4. Empirical Evidence

3.4.1. Methodology

In this section, I study whether supply-side effects influence firms' capital structure choices, after controlling for the effects of demand-side factors. To do this analysis, I use the following regression:

$$\text{LEVERAGE}_{it}=\alpha+\beta_1\text{BOND ACCESS}_{it}+\beta_2\text{SIZE}_{it}+\beta_3\text{M/B}_{it}+\beta_4\text{ASSET TANGIBILITY}_{it}$$
$$+\beta_5\text{PROFITABILITY}_{it}+\beta_6\text{NDTS}_{it}+\beta_7\text{YEAR(-1) RETURN}_{it}+\beta_8\text{RISK}_{it} \quad (1)$$

where LEVERAGE denotes the market debt ratio or book debt ratio, and i and t denote the i^{th} firm and t^{th} year, respectively. Similar to Faulkender and Peterson (2006), I use having a credit rating (S&P or DBRS) as a proxy for bond market access in my analysis, where BOND ACCESS equals one if the firm has a credit rating and zero otherwise. A positive coefficient on BOND ACCESS will support Hypothesis 1 that firms with bond market access, as measured by a credit rating, have higher leverage compared to firms without access, after controlling for the demand-side effects.

The remaining explanatory variables are those commonly used in the capital structure literature to measure the demand of debt (see for example, Rajan and Zingales (1995) and Welch (2004)). Table 3.A1 provides a summary of the variables and their predicted correlation with leverage. Firm size (SIZE) is the natural logarithm of total assets, and it is expected to be positively correlated with leverage because bankruptcy costs are likely to decline with firm size (see for example, Warner (1977) and Frank and Goyal (2004)). The Market-to-book ratio (M/B) is defined as the ratio of the book value of assets minus the book value of equity plus the market value of equity divided by the book value of assets, and it is a proxy for the firm's growth opportunities. Myers (1977) suggests that the higher the firm's growth opportunity, the higher the agency costs of debt, and the lower the firm's leverage.

Asset tangibility (ASSET TANGIBILITY) is the ratio of the firm's net plant and equipment over total assets, and this ratio represents the firm's collateral value. A positive relation is expected between leverage and asset tangibility because firms with a

larger collateral value are likely to borrow more and/or obtain a more favourable debt contract. Profitability (PROFITABILITY) is measured as the ratio of the firm's operating income before depreciation divided by its total sales. A firm's profitability and leverage could be negatively related because the pecking order theory predicts that a firm should first use its internal funds to finance its investments before seeking external funds (Myers (1984)). Non-debt tax shields (NDTS) is defined as the ratio of depreciation over total assets. DeAngelo and Masulis (1980) predict that debt level is negatively related to the availability of non-debt tax shields because the tax benefit from additional debt financing declines with non-debt tax shields. I also use the previous year's equity return (YEAR(-1) RETURN) to account for the debt ratio dynamics (Welch (2004)). The previous year's equity return could be negatively correlated with leverage because an increase in the market value of the firm will lower the market debt ratio. Moreover, a firm may time the market by issuing additional equity when the previous year's stock return is high. Finally, cash flow volatility (RISK) is the standard deviation of the ratio of the firm's cash flow over total sales in the past three years, and it is expected to be negatively associated with leverage.

I use both the market and book debt ratios as the dependent variables, and the Ordinary Least Squares (OLS) with robust standard errors (White (1980)), and panel data approaches (fixed and random effects model) for estimation. The Lagrangian Multiplier (LM) test (Breusch and Pagan (1980)) and Hausman specification test (Hausman (1978)) show that the fixed effects model is more appropriate than the random effects model and the random effects model is more suitable than the OLS model. The results from the random effects model are quantitatively similar to that of the OLS and fixed effects

models. To conserve space, I only report the results from the fixed effect model and the OLS model in the tables. I also include industry dummies based on firms' first three-digit primary SIC codes in the OLS regression, and the year dummies in both the fixed effects and OLS regressions. The coefficients on industry and year dummies are not shown in the tables to conserve space.

3.4.2. The Impact of Bond Market Access on Leverage

Table 3.4 reports the regression results and the evidence supports the hypothesis that firms with bond market access have significantly higher leverage ratios than those without access, after controlling for the demand side effects on leverage. The coefficient on BOND ACCESS is positive and significant at the 1% level with either market or book debt ratio as the dependent variable and in both the OLS and fixed effects models. For instance, in the fixed effects model firms with bond market access have 5.63 (5.87) percentage points higher debt ratios than firms with no access based on market (book) ratios, after controlling for the demand-side effects. The evidence indicates that the impact of bond market access on leverage is both statistically and economically significant.

[Insert Table 3.4 about here]

The signs of the coefficients on the control variables are generally consistent with those reported in prior studies. In particular, SIZE and ASSET TANGIBILITY have a significant effect on leverage. Moving a firm's annual assets from \$42.64M (25th

percentile) to \$584.17M (75th percentile) increases the firm's market debt ratio by 6.65 percentage points (2.54*(ln(584.17)-ln(42.64)) (column (2)). Similarly, increasing a firm's tangible assets ratio from the 25th percentile (18.20%) to the 75th percentile (63.50%) leads to a 6.72 percentage points (14.83*(0.635-0.182)) increase in the firm's market debt ratio. The coefficient on YEAR(-1) RETURN is negative, supporting the view of Welch (2004) that firms may time the market by issuing additional equity when the previous year's stock return is high. SIZE, ASSET TANGIBILITY and YEAR(-1) RETURN are significant in both the fixed effects and OLS models whereas PROFITABILITY and RISK are statistically significant under the OLS model but not under the fixed effects model (columns (1) to (4)).

3.4.3 The Impact of Credit Quality on Leverage

To examine whether the impact of access to the public bond market on capital structure varies between high quality and low quality firms, I use the following regression:

$$\begin{aligned} \text{LEVERAGE}_{it} = {} & \alpha + \beta_1 \text{BOND ACCESS}_{it} + \beta_2 \text{LOW CREDIT QUALITY}_{it} \\ & + \beta_3 \text{SIZE}_{it} + \beta_4 \text{M/B}_{it} + \beta_5 \text{ASSET TANGIBILITY}_{it} + \beta_6 \text{PROFITABILITY}_{it} \\ & + \beta_7 \text{NDTS}_{it} + \beta_8 \text{YEAR(-1) RETURN}_{it} + \beta_9 \text{RISK}_{it} \end{aligned} \quad (2)$$

where LOW CREDIT QUALITY equals one if the firm's credit rating is BB or below, and zero otherwise. In regression (2), the coefficients on BOND ACCESS and LOW CREDIT QUALITY measure the leverage differences between high credit quality firms and firms without a credit rating, and between low credit quality firms and high credit quality firms, respectively.

[Insert Table 3.5 about here]

Table 3.5 reports the results of regression (2) and the evidence shows that the statistical and economical significance of bond market access on leverage is much stronger for low credit quality firms. The coefficient on LOW CREDIT QUALITY is consistently significant at the 1% level under different dependent variables and model specifications, indicating that the impact of bond market access is significantly different between high and low credit quality firms. The value of the coefficient on LOW CREDIT QUALITY is much larger than that on BOND ACCESS in all specifications. For example, the coefficient on LOW CREDIT QUALITY is 7.71 versus 2.01 on BOND ACCESS (column (2)). This indicates that the marginal impact of bond market access on low credit quality firms is almost five times ((7.71+2.01)/2.01) that for high credit quality firms, after controlling for demand-side effects of leverage. Similarly, the OLS regression results (column (3)) indicate that low quality firms have 178 percent ((15.14+2.78)/10.05) higher leverage than firms without a credit rating whereas this percentage is only 28 percent (2.78/10.05) for the high quality firms. The signs and significance levels on the remaining control variables are similar to that reported in Table 3.4.

In sum, I find that firms with bond market access, as measured by having a credit rating, have significantly higher leverage ratios than firms without access, consistent with Faulkender and Petersen's (2006) findings in the US sample. However, this result is driven largely by the low credit quality firms in my sample. I also check the robustness of the results by using total debt (market and book) ratios as alternative dependent variables,

because having a credit rating could indirectly impact a firm's short-term debt such as line of credit and commercial paper. I find that the results are very close to that in Tables 3.4 and 3.5.

Several explanations are plausible for my results. On the one hand, as discussed in Section 3.2, the Canadian debt market (private and public) caters largely for high credit quality firms and, unlike in the US, small and medium size firms rely mainly on bank financing and are likely to face a higher cost of debt. Moreover, since low credit quality firms in my sample are smaller, have less tangible assets, lower profitability, and higher cash flow volatility, they are likely to have more difficulty in obtaining bank loans and are likely to face more severe credit rationing than high credit quality firms. Therefore, the marginal benefit of access to the larger and well developed high-yield bond market in the US is likely to be much higher for the low credit quality firms. On the other hand, high credit quality firms are likely to be more concerned about maintaining their credit ratings (Kisgen (2005a)). Thus, they may not borrow aggressively even when they have access to the bond markets. Although my test cannot untangle these two effects, the evidence reflects a joint impact on the low and high credit quality firms.

3.4.4. Robustness Checks

3.4.4.1. Matched Sample

One problem of using credit rating to measure supply-side effects is that it is highly positively correlated with firm size. Firms with a credit rating are likely to be significantly larger than those without credit ratings. Recall that in Table 3.3, the mean (median) size of firms that have a credit rating is almost fourteen (twenty eight) times that of firms without a credit rating. Issuing public debt also involves relatively high

issuance costs and it may not be economically affordable for small firms. Moreover, small firms may have very low debt capacity and it maybe better for them to retain a lower leverage in their capital structure. Thus, it is possible that the higher leverage for firms with bond market access could be driven primarily by their larger firm size rather than their credit rating.[23]

To minimize this possible sample bias due to the large firm size difference between the two groups, I construct a control sample of firms by matching each firm that has a credit rating with a firm without a rating based on the year, first two-digit SIC, and as close as possible on firm size. My matching follows a non-replacement process and results in a sample of 1,298 firm-year observations. In the matched sample, the firm size difference is reduced substantially. For example, the median size for firms with bond market access is only four times that of firms without access ($2824.00M versus $638.31M).

[Insert Table 3.6 about here]

Table 3.6 reports the regression results for the matched sample. The comparison of Table 3.6 with Tables 3.4 and 3.5 exhibits two major differences. First, the coefficients on BOND ACCESS (columns (1) to (4)) remain all positive and significant at the 1% level in the matched sample but their magnitudes are reduced substantially (by 50%) under the fixed effects model. Second, the result that the supply-side effect is driven primarily by the low credit quality firms remains intact, although the magnitude of the

[23] Datta, Iskandar-Datta and Patel (2000) compare a sample of firms with debt IPOs to a control sample with no debt. Their evidence suggests that larger firms and firms with greater financing needs are more likely to issue debt IPOs.

impact on leverage is lower by 50% under the fixed effects model. Moreover, the leverage difference between high credit quality firms and firms without credit ratings is insignificant in all specifications. Thus, my main conclusions remain the same under the matched sample, although decreasing the size difference between firms with and without a credit rating reduces the economic significance of supply-side effects on leverage.

3.4.4.2. The Endogeneity of Bond Access Dummy

Whether a firm has a credit rating is not an exogenous decision. A firm could choose not to obtain a credit rating if it does not need external financing or the costs to tap the public bond market exceed the benefits. In this section, I use the two-stage least squares approach (2SLS), as suggested by Wooldridge (2003), to address the endogeneity issues of the BOND ACCESS variable.

The first stage of the 2SLS generates a predicted value for BOND ACCESS using some additional instrumental variables (IV) and the exogenous variables in the second stage. I introduce two instrumental variables that are likely to be highly correlated with the bond access dummy variable but less correlated with leverage. The first instrument is the percentage of firms that have credit ratings in the same industry based on the 3-digit SIC codes. I include this instrumental variable because if there are many firms in an industry with a credit rating, rating agencies will be very familiar with the industry. Thus, it will be less costly for new firms to get rated because the incremental costs of analyzing a new firm in such industries will be lower for the rating agencies.

My second instrumental variable is firm age (AGE). Firm age could also significantly impact the firm's ability to access the bond market. The older the firm, the

better known the firm is likely to be, and the better position it has in tapping the bond market. AGE is calculated as the firm's fiscal year minus the year of incorporation. I draw the firm's year of incorporation information from the Compact Disclosure Canada database as well as from the SEDAR. After removing 257 observations with no information or conflicting information, I am left with 4,919 observations.

I report the 2SLS results in Table 3.7. I present the first stage result in column (1), and show the second stage results in columns (2) and (3) by using market and book debt ratios as alternative dependent variables. The results of instrumental variables regression with fixed effects are similar (not reported to conserve space).

[Insert Table 3.7 about here]

Consistent with my prediction, firm age and % of firms with bond market access in the same industry are significantly related to the bond market access dummy (column (1)). The *t*-statistics for these two variables are 33.13 and 4.76, respectively. In addition, the *F*-test rejects the null hypothesis that these two variables jointly equal to zero ($p<0.01$), indicating that they strongly predict the bond market access dummy.

The coefficients on predicted BOND ACCESS estimates are 11.57 ($t=7.27$) and 12.02 ($t=6.74$), respectively (columns (2) and (3)). The value of these coefficients are almost double those in Table 3.4, and suggests that the OLS regression without considering the endogenity issues produces under-estimated coefficients. Overall, my finding that Canadian firms with bond market access have significantly higher leverage

ratios than firms without such access remains robust, even after considering for possible endogenity.

3.4.4.3. Time Variation

In regressions (1) and (2), I use year dummies to control the time variation of cross-sectional leverage. This specification implicitly assumes that the impact of bond market access and credit quality on capital structure is constant over the years. To make sure that my results are not driven by a single year or a few years, I estimate OLS regressions that include interactive terms of BOND ACCESS *Year Dummies in regression (1) or BOND ACCESS*Year Dummies and LOW CREDIT QUALITY*Year Dummies in regression (2). The estimated coefficients on those interactive terms with book debt ratios are plotted in Figure 3.1 (the results with market debt ratio are very similar).

The plot of the coefficients on BOND ACCESS* Year Dummies (Reg.1) in Figure 3.1 (middle curve) shows a positive and upward trend over the years. The coefficient values increase from about 2 percentage points in 1991 to about 8 percentage points in the year 2002. This trend is consistent with the impact of macroeconomic conditions because both Canada and the US experienced a recession in the early 1990s followed by a strong economy in the remaining period. The separate plots for the high and low credit quality firms support that the greater impact of bond market access on leverage documented in my analysis is driven primarily by the low credit quality firms. The impact of bond market access on leverage for low credit quality firms (the top curve) is significant and varies from a low of about 12% ((10.36%+1.29%)), in 1992) to a high

of 23% ((21.63%+1.76%), in 1998). The curve shows an upward trend from 1993 to 1999 and a downward trend from 2000 to 2003. This pattern is parallel to that of the US high-yield bond market because most of Canadian low quality bonds are issued in the US.[24] In contrast, this impact is smaller for high credit quality firms, varying from zero in 1991 to a high of 5% in 2002. Overall, the evidence shows that my results are robust to the impact of time variation.

3.4.4.4. Debt Issuance Activity

My analysis so far examines the impact of bond market access and credit quality on the firms' leverage *level*. However, the leverage *level* cannot tell whether firms with bond market access actually issue more debt in the debt market than firms without access. To fill the gap, I analyze the actual issuance of bonds (in the public and private as well as in the domestic and international debt markets) by my sample firms during the 1990-2003 period. I find information on 448 debt issues, and the data is obtained from the SDC Global New Issues database. I include only those issues that provide information on the dollar amount of debt offerings.

Of the 448 debt issues, 66% (296/448) are offered by firms with bond market access and the remaining 34% (152/448) are by firms without access. The dollar amount of debt issuance by firms with bond market access is about three times that of firms without access ($172M versus $56M). However, as a percentage of the relative proceeds

[24] In the early 1990s, the US high-yield bond market collapsed due to a recession, a poorly performing stock market and a large increase in corporate defaults. After year 1993, the US high-yield bond market began recovering when the economy was in an expansion cycle and interest rates were low. The market dropped again due to the terrorist attacks in September 2001 and a large number of bond defaults in 2001 (Altman and Arman, 2002).

after adjusting for the firm's year-end total assets (proceeds/assets), firms with bond market access issue less debt compared to firms without access (4% versus 8%).

Based on the marketplace information, I further divide the issues into offerings in the public and private markets. My data confirms that firms with credit ratings rely heavily on the public debt market, similar to those in the US. Of the 296 issues by firms with a credit rating, 90% (or 265) are offered in the public debt market. Moreover, both the average dollar amount and the relative value of the proceeds are much higher for the public debt issues than the private debt issues. I also find that the firms without a credit rating offered 106 issues in the private debt market and 46 issues in the public debt market. These 46 issues reflect a small bias in the BOND ACCESS variable because I assume that firms without credit rating have no access to the public debt market. I redo the analysis in Tables 3.4 and 3.5 by recoding those firm-year observations into the category of having bond market access, and find that my results remain essentially the same.

Among the firms with credit ratings, 90% (264/296) of issues are offered by high credit quality firms and the remaining 10% are issued by low credit quality firms. The average dollar amount of issues by high and low credit quality firms is very similar ($172M versus $171M) but the amount as a percentage of the firm's total assets for the low credit quality firms is more than three times that for the high quality firms (11% versus 3%). Thus, low credit quality firms are very aggressive in raising debt in the debt markets relative to their firm size. In addition, I find that 59% (19/32) of issues by low quality firms are in the US market, compared to 41% (107/264) by high quality firms. In

sum, my main results in Sections 4.2 and 4.3 are largely supported by the analysis of the data of actual debt issuance by the sample firms.

3.5. Conclusions

This study examines the impact of bond market access on capital structure for a sample of Canadian firms during 1990 to 2003 period. My analysis shows two main findings. First, consistent with Faulkender and Petersen's (2006), I find that Canadian firms with bond market access, as measured by having a credit rating, have significantly higher leverage ratios than firms without access. Thus, I confirm the US findings that supply-side effects have a significant impact on leverage in the Canadian sample.

Second, I argue that the impact of bond market access on capital structure may not be homogenous across firms with different credit quality. I show that this impact is much larger for Canadian low credit quality firms compared to high credit quality firms. My result could be driven by a number of reasons. For instance, one reason could be that access to the bond market is more beneficial for lower credit quality firms as it can largely remove firms' financial constraints and significantly improve their ability to tap additional sources of capital. Another reason could be that even though high quality firms have the opportunity to raise more debt, they may not do so due to the concern of being downgraded in credit rating. I suggest that future research should examine these possible reasons.

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Table 3.1. Leverage Comparison of Bond Market Access and Credit Quality

Market Debt Ratio (%)	*N*	*Mean*	*25%*	*Median*	*75%*
(1) Total Sample	5176	13.46	0.27	9.22	21.74
(2) No Access to Bond Market	4452	11.87	0.05	6.38	19.54
(3) Access to Bond Market	724	23.20	13.23	19.95	31.99
(4) High Credit Quality (Investment Grade)	504	18.30	11.68	17.30	23.98
(5) Low Credit Quality (Speculative Grade)	220	34.41	22.32	34.88	45.67
Difference: (3) - (2)		11.33	13.18	13.57	12.45
		(<0.01)		(<0.01)	
Difference: (4) - (2)		6.43	11.63	10.92	4.44
		(<0.01)		(<0.01)	
Difference: (5) - (2)		22.54	22.27	28.50	26.13
		(<0.01)		(<0.01)	
Difference: (5) - (4)		16.11	10.64	17.58	21.69
		(<0.01)		(<0.01)	

Book Debt Ratio (%)	*N*	*Mean*	*25%*	*Median*	*75%*
(1) Total Sample	5176	16.47	0.52	12.81	25.89
(2) No Access to Bond Market	4452	14.61	0.10	8.92	23.51
(3) Access to Bond Market	724	27.93	18.36	25.57	35.59
(4) High Credit Quality (Investment Grade)	504	22.88	16.51	22.17	29.24
(5) Low Credit Quality (Speculative Grade)	220	39.50	29.69	38.33	49.01
Difference: (3) - (2)		13.32	18.26	16.65	12.08
		(<0.01)		(<0.01)	
Difference: (4) - (2)		8.27	16.41	13.25	5.73
		(<0.01)		(<0.01)	
Difference: (5) - (2)		24.89	29.59	29.41	25.50
		(<0.01)		(<0.01)	
Difference: (5) - (4)		16.62	13.18	16.16	19.77
		(<0.01)		(<0.01)	

The leverage ratios of Canadian non-financial and non-utility firms during 1990-2003. A firm is defined as having (without) access to bond markets if it has (does not have) an S&P or DBRS long-term credit rating in the respective year. A firm is defined as a high (low) quality firm if its S&P or DBRS long-term credit rating in the respective year is BBB or above (BB or below). The market debt ratio is the ratio of long-term debt over the sum of total debt and the market value of equity. The book debt ratio is the ratio of long-term debt over the sum of total debt and the book value of equity. The book debt is truncated between zero and one. The numbers in parentheses under Mean (Median) difference are the *p*-value of *t*-tests (*Wilcoxon* rank sum *z* tests).

Table 3.2. Industrial Comparison of Debt Ratios by Bond Market Access and Credit Quality

	No Access to Bond Market			Access to Bond Market			Access: High Quality (Investment-Grade)			Access: Low Quality (Speculative-Grade)			*t-test:* Access vs. No Access		*t-test:* High vs. Low Quality	
Industries	*N*	*Market Debt*	*Book Debt*	*N*	*Market Debt*	*Book Debt*	*N*	*Market Debt*	*Book Debt*	*N*	*Market Debt*	*Book Debt*	*Market Debt*	*Book Debt*	*Market Debt*	*Book Debt*
		(1)	*(2)*		*(3)*	*(4)*		*(5)*	*(6)*		*(7)*	*(8)*	*(3)-(1)*	*(4-2)*	*(7)-(5)*	*(8)-(6)*
1. Resource	1285	11.51	14.21	104	17.12	24.07	81	16.36	22.55	23	19.79	29.42	<0.01	<0.01	0.11	0.03
2. Manufacturing	1974	12.17	15.04	462	23.65	28.23	318	18.27	22.46	144	35.52	40.98	<0.01	<0.01	<0.01	<0.01
3. Wholesale & Retail	535	11.65	13.26	110	21.75	24.24	94	20.20	23.75	16	30.86	27.13	<0.01	<0.01	<0.01	0.09
4. Service	632	11.81	15.12	44	35.08	42.07	11	17.15	30.30	33	41.05	45.99	<0.01	<0.01	<0.01	0.02
5. Public	26	14.07	17.00	4	38.08	39.91				4	38.08	39.91	0.02	0.06		

The leverage ratios of Canadian non-financial and non-utility firms during 1990-2003. A firm is defined as having (without) access to bond markets if it has (does not have) an S&P or DBRS long-term credit rating in the respective year. A firm is defined as a high (low) quality firm if its S&P or DBRS long-term credit rating in the respective year is BBB or above (BB or below). The market debt ratio is the ratio of long-term debt over the sum of total debt and the market value of equity. The book debt ratio is the ratio of long-term debt over the sum of total debt and the book value of equity. The book debt is truncated between zero and one. The broad industry sectors are based on firms' primary SIC codes. Resource sector: SIC<2000. Manufacturing sector: 2000<=SIC<4000, Wholesale & Retail sector: 5000<=SIC<6000. Service sector: 7000<=SIC<9000. Public sector: SIC>=9000. The numbers reported in the last four columns are the *t*-tests results.

Table 3.3. Selected Firm Characteristics by Bond Market Access and Credit Quality

	No Access To Bond Market	Access To Bond Market	High Credit Quality	Low Credit Quality	Mean (Median) Tests	
	(1)	(2)	(3)	(4)	(2) - (1)	(4) - (3)
TOTAL ASSETS (M$)	347.88	5036.26	6437.23	1826.76	<0.01	<0.01
	(100.59)	(2902.92)	(4104.50)	(1275.16)	<0.01	<0.01
ASSET TANGIBILITY	0.41	0.52	0.53	0.48	<0.01	<0.01
	(0.37)	(0.54)	(0.55)	(0.53)	<0.01	<0.01
M/B	2.33	1.36	1.38	1.31	<0.01	0.21
	(1.29)	(1.20)	(1.27)	(1.08)	<0.01	<0.01
R&D	1.72	0.01	0.01	0.01	0.13	0.05
	(0.00)	(0.00)	(0.00)	(0.00)	<0.01	<0.01
SALES GROWTH	0.90	0.10	0.10	0.11	<0.01	0.59
	(0.09)	(0.07)	(0.07)	(0.06)	<0.01	0.17
PROFITABILITY	-4.37	0.17	0.18	0.15	<0.01	0.10
	(0.08)	(0.15)	(0.16)	(0.12)	<0.01	<0.01
RISK	5.55	0.06	0.04	0.10	<0.01	<0.01
	(0.05)	(0.02)	(0.02)	(0.05)	<0.01	<0.01
YEAR(-1) RETURN	0.26	0.10	0.12	0.06	<0.01	0.23
	(-0.01)	(0.05)	(0.06)	(-0.09)	<0.01	<0.01
NDTS	0.08	0.05	0.05	0.06	0.02	0.28
	(0.05)	(0.05)	(0.05)	(0.04)	0.38	0.12

The firms characteristics of Canadian non-financial and non-utility firms during 1990-2003. A firm is defined as having (without) access to bond markets if it has (does not have) an S&P or DBRS long-term credit rating in the respective year. A firm is defined as a high (low) quality firm if its S&P or DBRS long-term credit rating in the respective year is BBB or above (BB or below). The market debt ratio is the ratio of long-term debt over the sum of total debt and the market value of equity. The book debt ratio is the ratio of long-term debt over the sum of total debt and the book value of equity. The book debt is truncated between zero and one. ASSET TANGIBILITY is the ratio of net plant and equipment over total assets. M/B is the ratio of the book value of assets minus the book value of equity plus the market value of equity divided by the book value of assets. R&D is the ratio of research and development over sales. R&D is coded as zero if the firm does not report any R&D. SALES GROWTH is the growth rate of sales over the past year. PROFITIABILITY the ratio of operating income before depreciation divided by the total sales. RISK is the standard deviation of the ratio of cash flow over total sales over the past three years. YEAR(-1) RETURN is the previous year's equity return. NDTS is the ratio of depreciation over total assets. The number under Mean (Median) tests are the *p*-value of *t*-tests (*Wilcoxon* rank sum *z* tests).

Table 3.4. The Impact of Bond Market Access on Leverage Ratios (Full Sample)

	Dependent Variable: Market Debt Ratio		Dependent Variable: Book Debt Ratio	
	(1) OLS with Robust S.E.	(2) Fixed Firm Effects	(3) OLS with Robust S.E.	(4) Fixed Firm Effects
INTERCEPT	10.73	-2.51	10.45	2.96
	(1.94)*	(-1.86)*	(2.30)**	(1.78)
BOND ACCESS	4.75	5.63	8.61	5.87
	(6.55)***	(7.13)***	(9.78)***	(6.02)***
SIZE	0.79	2.54	0.52	1.69
	(6.05)***	(10.30)***	(2.66)***	(5.53)***
M/B	-0.01	0.01	0.00	-0.01
	(-0.64)	(0.84)	(0.06)	(-0.68)
ASSET TANGIBILITY	17.93	14.83	20.89	14.99
	(13.37)***	(10.84)***	(12.23)***	(8.87)***
PROFITABILITY	-0.01	0.00	-0.01	-0.00
	(-2.50)**	(0.23)	(-3.31)***	(-0.54)
NDTS	0.21	0.09	0.06	-0.37
	(2.46)**	(0.40)	(0.57)	(-1.35)
YEAR(-1) RETURN	-0.60	-0.46	-0.43	-0.30
	(-3.90)***	(-4.96)***	(-3.04)***	(-2.61)***
RISK	-0.01	0.00	-0.02	-0.00
	(-3.26)***	(0.02)	(-3.63)***	(-0.61)
3-digit SIC Dummies	Yes		Yes	
Year Dummies	Yes	Yes	Yes	Yes
LM test	$Chi^2(1) = 6348.49$***		$Chi^2(1) = 5496.46$***	
Hausman test	$Chi^2(20) = 41.68$***		$Chi^2(20) = 39.48$***	
N	5176	5176	5176	5176
R^2	0.37	0.11	0.30	0.05

The results of OLS regression with robust standard errors (White, 1980) and fixed firm effects for a sample of Canadian non-financial and non-utility firms during 1990-2003. The market debt ratio is the ratio of long-term debt over the sum of total debt and the market value of equity. The book debt ratio is the ratio of long-term debt over the sum of total debt and the book value of equity. The book debt is truncated between zero and one. BOND ACCESS equals one if the firm has an S&P or DBRS long-term credit rating, and zero otherwise. SIZE is the natural logarithm of total assets. M/B is the ratio of the book value of assets minus the book value of equity plus the market value of equity divided by the book value of assets. ASSET TANGIBILITY is the ratio of net plant and equipment over total assets. PROFITIABILITY the ratio of operating income before depreciation divided by the total sales. NDTS is the ratio of depreciation over total assets. YEAR(-1) RETURN is the previous year's equity return. RISK is the standard deviation of the ratio of cash flow over total sales over the past three years. The R^2 reported under the OLS regressions are adjusted R^2. The R^2 reported under the fixed firm effect regressions are with-in estimation R^2. Industry dummies based on the first three-digit SIC codes and year dummies are included in the OLS regressions. Year dummies are included in the fixed firm effects regressions. The coefficients on those dummies are not reported in the table, but are available upon request. *t*-values are reported in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 3.5. The Impact of Bond Market Access and Credit Quality on Leverage Ratios (Full Sample)

	Dependent Variable: Market Debt Ratio		Dependent Variable: Book Debt Ratio	
	(1) OLS with Robust S.E.	(2) Fixed Firm Effects	(3) OLS with Robust S.E.	(4) Fixed Firm Effects
INTERCEPT	10.36	-2.29	10.05	3.22
	(1.88)*	(-1.70)*	(2.22)**	(1.93)*
BOND ACCESS	-0.68	2.01	2.78	1.77
	(-0.97)	(2.11)**	(3.19)***	(1.50)
LOW CREDIT QUALITY	14.10	7.71	15.14	8.73
	(12.24)***	(6.74)***	(11.31)***	(6.17)***
SIZE	1.02	2.55	0.76	1.69
	(7.85)***	(10.36)***	(3.88)***	(5.57)***
M/B	-0.00	0.01	0.01	-0.01
	(-0.11)	(0.84)	(0.70)	(-0.69)
ASSET TANGIBILITY	17.84	14.71	20.80	14.86
	(13.38)***	(10.81)***	(12.23)***	(8.83)***
PROFITABILITY	-0.01	0.00	-0.01	-0.00
	(-2.11)**	(0.23)	(-2.98)***	(-0.54)
NDTS	0.23	0.09	0.09	-0.37
	(2.64)***	(0.41)	(0.76)	(-1.35)
YEAR(-1) RETURN	-0.61	-0.44	-0.43	-0.28
	(-3.84)***	(-4.77)***	(-3.01)***	(-2.42)**
RISK	-0.01	0.00	-0.02	-0.00
	(-2.75)***	(0.02)	(-3.20)***	(-0.61)
3-digit SIC Dummies	Yes		Yes	
Year Dummies	Yes	Yes	Yes	Yes
LM test	$Chi^2(1) = 5090.69$***		$Chi^2(1) = 4761.34$***	
Hausman test	$Chi^2(21) = 85.82$***		$Chi^2(21) = 58.43$***	
N	5176	5176	5176	5176
R^2	0.39	0.12	0.32	0.06

The results of OLS regression with robust standard errors (White, 1980) and fixed firm effects for a sample of Canadian non-financial and non-utility firms during 1990-2003. The market debt ratio is the ratio of long-term debt over the sum of total debt and the market value of equity. The book debt ratio is the ratio of long-term debt over the sum of total debt and the book value of equity. The book debt is truncated between zero and one. BOND ACCESS equals one if the firm has an S&P or DBRS long-term credit rating, and zero otherwise. LOW CREDIT QUALITY equals one if the firm has an S&P or DBRS long-term credit rating of BB or below in the respective year, and zero otherwise. SIZE is the natural logarithm of total assets. M/B is the ratio of the book value of assets minus the book value of equity plus the market value of equity divided by the book value of assets. ASSET TANGIBILITY is the ratio of net plant and equipment over total assets. PROFITIABILITY the ratio of operating income before depreciation divided by the total sales. NDTS is the ratio of depreciation over total assets. YEAR(-1) RETURN is the previous year's equity return. RISK is the standard deviation of the ratio of cash flow over total sales over the past three years. The R^2 reported under the OLS regressions are adjusted R^2. The R^2 reported under the fixed firm effect regressions are with-in estimation R^2. Industry dummies based on the first three-digit SIC codes and year dummies are included in the OLS regressions. Year dummies are included in the fixed firm effects regressions. The coefficients on those dummies are not reported in the table, but are available upon request. *t*-values are reported in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 3.6. The Impact of Bond Market Access and Credit Quality on Leverage (Robustness Check for a Matched Sample)

	The Impact of Bond Market Access				*The Impact of Credit Quality*			
	Dependent Variable: Market Debt Ratio		Dependent Variable: Book Debt Ratio		Dependent Variable: Market Debt Ratio		Dependent Variable: Book Debt Ratio	
	(1) OLS with Robust S.E.	(2) Fixed Firm Effects	(3) OLS with Robust S.E.	(4) Fixed Firm Effects	(5) OLS with Robust S.E.	(6) Fixed Firm Effects	(7) OLS with Robust S.E.	(8) Fixed Firm Effects
INTERCEPT	11.82	-2.44	8.67	9.17	6.50	-4.23	2.37	7.06
	(3.20)***	(-0.46)	(2.32)**	(1.54)	(1.75)*	(-0.80)	(0.62)	(1.19)
BOND ACCESS	5.62	2.84	8.55	2.85	-0.15	1.05	1.71	0.72
	(5.57)***	(2.70)***	(7.43)***	(2.40)**	(-0.16)	(0.91)	(1.57)	(0.56)
LOW CREDIT QUALITY					12.37	4.67	14.66	5.54
					(9.64)***	(3.69)***	(9.38)***	(3.88)***
SIZE	-0.72	2.62	-0.81	1.56	0.51	2.94	0.64	1.94
	(-1.93)*	(3.74)***	(-1.88)*	(1.97)**	(1.40)	(4.19)***	(1.45)	(2.45)**
M/B	-2.38	-2.04	-0.40	-1.00	-2.30	-1.95	-0.32	-0.89
	(-3.78)***	(-4.98)***	(-0.95)	(-2.16)**	(-3.60)***	(-4.77)***	(-0.70)	(-1.93)
ASSET TANGIBILITY	22.92	15.37	20.69	7.18	22.81	15.23	20.56	7.02
	(7.29)***	(4.46)***	(5.81)***	(1.85)*	(7.39)***	(4.45)***	(6.03)***	(1.82)*
PROFITABILITY	0.02	-0.20	0.24	0.76	-0.08	-0.21	0.13	0.74
	(0.22)	(-0.36)	(3.18)***	(1.21)	(-0.90)	(-0.38)	(1.56)	(1.20)
NDTS	2.33	2.43	-1.52	-3.13	-0.34	2.13	-4.68	-3.48
	(0.29)	(0.36)	(-0.19)	(-0.42)	(-0.05)	(0.32)	(-0.65)	(-0.47)
YEAR(-1) RETURN	-0.22	-0.26	-0.18	-0.29	-0.21	-0.22	-0.16	-0.24
	(-1.07)	(-1.61)	(-1.05)	(-1.61)	(-1.00)	(-1.34)	(-0.94)	(-1.33)
RISK	0.06	0.01	0.04	0.01	0.05	0.01	0.03	0.01
	(1.24)	(0.15)	(1.31)	(0.12)	(1.00)	(0.13)	(1.00)	(0.10)
3-digit SIC Dummies	Yes		Yes		Yes		Yes	
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1298	1298	1298	1298	1298	1298	1298	1298
R^2	0.46	0.12	0.42	0.04	0.51	0.13	0.47	0.06

The results of OLS regression with robust standard errors (White, 1980) and fixed firm effects for a sample of Canadian non-financial and non-utility firms without credit ratings matched with the firms with credit ratings during 1990-2003. The matching method is sampling without replacement, and is based on year, first two-SIC codes, and as close as possible of firm size. The market debt ratio is the ratio of long-term debt over the sum of total debt and the market value of equity. The book debt ratio is the ratio of long-term debt over the sum of total debt and the book value of equity. The book debt is truncated between zero and one. BOND ACCESS equals one if the firm has an S&P or DBRS long-term credit rating in the respective year, and zero otherwise. LOW CREDIT QUALITY equals one if the firm has an S&P or DBRS long-term credit rating of BB or below in the respective year, and zero otherwise. SIZE is the natural logarithm of total assets. M/B is the ratio of the book value of assets minus the book value of equity plus the market value of equity divided by the book value of assets. ASSET TANGIBILITY is the ratio of net plant and equipment over total assets. PROFITIABILITY the ratio of operating income before depreciation divided by the total sales. NDTS is the ratio of depreciation over total assets. YEAR(-1) EQUITY RETURN is the previous year's equity return. RISK is the standard deviation of the ratio of cash flow over total sales over the past three years. The R^2 reported under the OLS regressions are adjusted R^2. The R^2 reported under the fixed firm effect regressions are with-in estimation R^2. Industry dummies based on the first three-digit SIC codes and year dummies are included in the OLS regressions. Year dummies are included in the fixed firm effects regressions. The coefficients on those dummies are not reported in the table, but are available upon request. *t*-values are reported in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 3.7. The Impact of Bond Market Access on Firm's Leverage Ratios (Robustness Check for Instrumental Variables)

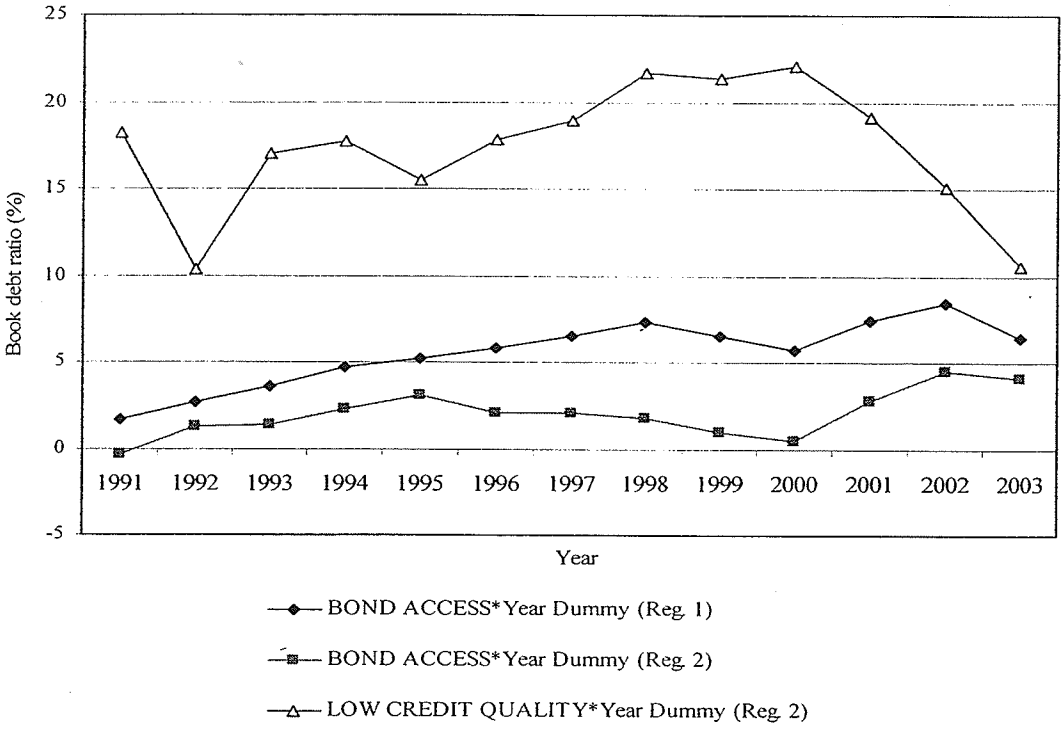
	Endogeneity in BOND ACCESS		
	First Stage	Second Stage	
		Market Debt	Book Debt
	(1)	(2)	(3)
INTERCEPT	-0.35 (-15.27)***	0.070 (4.98)***	0.094 (5.58)***
% of Firms with Bond Access in Same Industry	0.68 (33.13)***		
AGE	0.00 (4.76)***		
BOND ACCESS*		11.57 (7.27)***	12.02 (6.74)***
INDUSTRY % LOW QUALITY			
LOW CREDIT QUALITY*			
SIZE	0.07 (31.45)***	0.71 (3.63)***	0.49 (1.94)*
M/B	0.00 (4.20)***	-0.01 (-0.81)	-0.01 (-1.19)
ASSET TANGIBILITY	-0.03 (-2.08)**	10.81 (14.25)***	11.88 (13.00)***
PROFITABILITY	0.00 (1.64)	-0.01 (-2.46)**	-0.01 (-3.40)***
NDTS	0.01 (1.79)*	0.13 (1.10)	0.03 (0.44)
YEAR(-1) RETURN	-0.01 (-2.67)***	-0.70 (-3.44)***	-0.56 (-3.38)***
RISK	0.00 (2.74)***	-0.02 (-4.91)***	-0.02 (-5.37)**
Year Dummies	Yes	Yes	Yes
N	4919	4919	4919
Adj. R^2	0.48	0.16	0.13
F-stat: $b_{Instruments} = 0$	26.75***		

The results of two-stage least square regression for a sample of Canadian non-financial and non-utility firms during 1990-2003. In the first stage, the dependent variable is BOND ACCESS, and the instrumental variables are % of firms with bond market access in the same industry and firm age as well as the exogenous variables in the second stage regression. The market debt ratio is the ratio of long-term debt over the sum of total debt and the market value of equity. The book debt ratio is the ratio of long-term debt over the sum of total debt and the book value of equity. The book debt is truncated between zero and one. % of Firms with Bond Access in Same Industry is the ratio of firms with bond market access over the total number of firms in the same 3-digit SIC code industry. AGE is the difference of firm's fiscal year and the year of incorporation. The year of incorporation information is drawn from the Compact D Canada and the SEDAR. BOND ACCESS equals one if the firm has an S&P or DBRS long-term credit rating in the respective year, and zero otherwise. BOND ACCESS* is the predicted value in the first stage regression. SIZE is the natural logarithm of total assets. M/B is the ratio of the book value of assets minus the book value of equity plus the market value of equity divided by the book value of assets. ASSET TANGIBILITY is the ratio of net plant and equipment over total assets. PROFITIABILITY the ratio of operating income before depreciation divided by the total sales. NDTS is the ratio of depreciation over total assets. YEAR(-1) RETURN is the previous year's equity return. RISK is the standard deviation of the ratio of cash flow over total sales over the past three years. The R^2 reported under the OLS regressions are adjusted R^2. The R^2 reported under the fixed firm effect regressions are with-in estimation R^2. Industry dummies based on the first three-digit SIC codes and year dummies are included in the OLS regressions. Year dummies are included in the fixed firm effects regressions. The coefficients on those dummies are not reported in the table, but are available upon request. *t*-values are reported in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 3.A1. Variable Definitions and Predicted Signs with Leverage

Variables	Definition	Predicted sign
BOND ACCESS	=1 if the firm has an S&P or DBRS long-term credit rating in the respective year; =0 otherwise.	+ Research Interest
LOW CREDIT QUALITY	=1 if the firm has an S&P or DBRS long-term credit rating of BB or below in the respective year; =0 otherwise.	Research Interest
Market Debt Ratio	Long-term debt/(Total debt+Market value of equity)	
Book Debt Ratio	Long-term debt/(Total debt+Book value of equity)	
Firm Size (SIZE)	Natural logarithm of total assets	+
Market-to-Book (M/B)	Book value of assets minus book value of equity plus market value of equity divided by the book value of assets.	-
Asset Tangibility (TANGIBLE ASSET)	Net plant and equipment / Total assets	+
Profitability (PROFITABILITY)	Operating income before depreciation / Total sales	-
Non-debt Tax Shield (NDTS)	Depreciation and amortization / Total assets	-
YEAR(-1) RETURN	Previous year's equity return.	-
Cash Flow Volatility (RISK)	Standard deviation of (cash flows/sales) over the past three years	-

Figure 3.1. Bond Market Access: Time Variation Effect



This figure reports the estimated coefficients (ACCESS*Year Dummy and LOW CREDIT QUALITY*Year Dummy) from the regressions that control for the time variation of bond market access and credit quality on capital structure. The regression is estimated in the OLS and uses book debt ratio as the dependent variable.

CHAPTER 4

MARKET TIMING, CAPITAL STRUCTURE AND CROSS LISTING

Abstract

I examine the impact of market timing on capital structure for a sample of Canadian firms that issued seasoned equity offerings during the 1985-2003 period. I find a weak short-term effect but no long-term effect of market timing on capital structure. I also find that the short-term market timing impact is mainly reflected in the market-to-book ratio, and is primarily from the net equity issuance. More importantly, I analyze whether the market timing impact is stronger for Canadian firms that are cross-listed on the US exchanges than for their domestically listed peers. My evidence is mixed and shows that cross-listed firms raise substantially more equity proceeds than non cross-listed firms, after controlling for the impact of market timing and other firm-specific factors. However, I do not find a statistically significant difference between the two groups of firms in their short-term and long-run impacts of market timing on capital structure.

JEL Classification: G32

Keywords: Market Timing, Capital Structure, Cross Listing, Canada

4.1. Introduction

Market timing is a very important topic in corporate finance research. The early studies largely agree that firms tend to take the advantage of "windows of opportunity" and issue more equity when firms' market value of equity is temporarily high, the asymmetric information level is low, or the economy is in an expansion cycle.[25] Graham and Harvey's (2001) survey of CFOs' opinions about the practice of corporate finance also finds strong evidence that managers are reluctant to issue common stock when they perceive that the stock is undervalued. More recently, whether and to what extent market timing has a short-term or long-term impact on firms' capital structure has received increased attention by researchers, but the issue is still under active debate. For instance, Baker and Wurgler (2002) find that market timing has a persistent effect (more than ten years) on firms' capital structure and show that leverage is significantly and negatively related to a measure of historical market valuations, whereas Alti (2005) shows that this impact is short-lived and vanishes after two years.

The existing evidence on the impact of market timing on capital structure is mainly based on the US initial public offering (IPO) samples. Whether the observed results are applicable to other countries is not clear. Furthermore, the IPO marks the transition of a firm from privately owned to public traded; thus, it is expected to yield a

[25] See for example, Baker and Wurgler (2000) document that the share of equity issues in the total new equity and debt issues strongly predicts the future stock market returns. Firms prefer to issue more equity before the periods of low market returns. Loughran and Ritter (1995, 1997) find that SEO issuers have poor stock returns in the post-issue period. Loughran and Ritter (1997) suggest that investors are over-optimistic about the operating performance of SEO issuers, but are disappointed about the deteriorating performance during the five years after the offerings. Choe, Masulis and Nanda (1993) find that the market reacts less negatively when a firm issues an SEO during the business expansion cycle. Their result supports the view that during expansion cycles, investors focus more on the valuable projects and pay less attention to the possibility of equity over-valuation. Bayless and Chaplinsky (1996) find that the negative price reaction to the SEO announcement is less pronounced in the periods of high equity issue volumes and suggest that firms should time the market and issue SEOs in the periods that the asymmetric information costs are low.

significant change in firm's capital structure. The anecdotal evidence shows that on average a firm's leverage drops by about 23% in the IPO year (drops from 66% to 43% in Baker and Wurgler (2002)) and, most researchers agree that there is a strong short-term impact of market timing on capital structure because market timing can benefit the firm in raising new capital at a low cost. However, whether and to what degree the evidence documented in the IPO samples is valid in seasoned equity offering (SEO) samples is not known.

In this study, I examine a sample of *Canadian SEOs* during the period of 1985-2003, and test whether there is a short-term or long-term impact of SEO market timing on capital structure. I use two measures of market timing to capture firms' motivation to time the market in a time-series and cross-sectional pattern. My first measure is firms' market-to-book ratio, which reflects the stylized fact that firms are more likely to issue equity when they have high market valuations. My second measure is a *'hot'* month dummy that takes a value of one if the SEO is offered in a *'hot'* month, proxied by a high numbers of SEO issuers in that particular month.

My results show that there is a weak short-term effect for the Canadian SEOs but no long-term effect of market timing on capital structure. This result could be partially due to the fundamental difference between the IPO and SEO events. In contrast to an IPO, the equity raised by an SEO may only marginally increase the book equity weight in the capital structure and may not lower the book leverage ratio substantially. My evidence shows that in the SEO year the leverage ratio declines to a smaller degree (about 5%), in contrast to a decrease of 23% shown in the prior literature on IPO market timing. Moreover, I find that the short-term market timing effect is mainly reflected in the

market-to-book ratio rather than the 'hot' month dummy. I also document that the short-term impact is mainly from the net equity issuance, supporting the market timing hypothesis and consistent with Baker and Wurgler (2002).

More importantly, I break down the sample into cross-listed and non cross-listed (non-cross) firms. Doing so offers me a unique perspective in examining the market timing issue and, to my best knowledge, this has not been analyzed in the prior studies. There are several reasons why cross-listed firms may differ from their domestically listed peers in their market timing ability.

First, the prior literature suggests that despite the increase in the globalization of capital markets in the last two decades, some barriers still remain that segment national capital markets (see for example, Mittoo (2003)). Cross-listed firms, who overcome some of these barriers, should have more flexibility in deciding when and where to raise new capital compared to their non-cross peers. When the domestic market is performing poorly relative to foreign markets, cross-listed firms have a better opportunity to raise capital abroad. Second, Myers and Majulf (1984) argue that firms should time equity markets in periods when the level of information asymmetry is low. Since cross-listed firms are usually required to conform to higher accounting standards and disclosure levels, I expect that they should have lower information asymmetry problems and, thus, should have better market timing opportunities than non-cross firms. Third, cross-listed firms can alleviate the "home bias" problem and attract more foreign investors. Holland and Warnock (2003) show that the most important determinant of a firm's weight in US portfolio is whether the firm is listed on a US exchange. Moreover, cross-listed firms have lower agency cost problems because they have better corporate governance and

better legal protection of minority shareholders (see for example, Reese and Weisbach (2002) and King and Segal (2003)).

I make the following predictions regarding the cross-listed versus non-cross firms: (*i*) Canadian firms that cross-list on the US exchanges should have better opportunity to time the US and Canadian markets, and they may do so by raising more proceeds when equity markets are hot and their market valuations are more favourable compared to domestically listed firms; (*ii*) The short-term and long-term impacts of market timing on capital structure between cross-listers and non cross-listers should be different.

My findings show mixed results. First, I document that cross-listed firms raise substantially higher equity proceeds (adjusted by firms' total assets in the pre-SEO year), after controlling for the hot month dummy, market-to-book ratio as well as several firm-specific variables. Second, I show that the decline in book leverage ratio in the SEO year is much larger (about 5.3%) for the cross-listed firms than for non-cross firms. However, I do not find a statistically significant difference between the two groups of firms in their short-term and long-term impacts of market timing on capital structure.

The remainder of Chapter 4 is organized as follows. In Section 4.2, I review and summarize the previous theoretical and empirical research. In Section 4.3, I describe the data. Section 4.4 includes the empirical tests. Section 4.4 discusses the conclusions.

4.2. Market Timing, Capital Structure and Cross Listing

In this section, I first provide a brief summary on the existing debate about the impact of market timing on capital structure. In sum, there is a general consensus that

there is a short-term market timing effect on capital structure, but whether this impact is persistent is still in active debate. Next, I discuss the reasons why cross-listed firms may differ from non-cross firms in their market timing ability. This perspective has not been explored in the previous literature.

4.2.1. Market Timing and Capital Structure

The prior studies on equity market timing and capital structure largely focus on the US samples and find conflicting evidence. On the one hand, Baker and Wurgler (2002) propose a market timing theory that "*capital structure is the cumulative outcome of attempts to time the equity market*", and find that market timing has a pronounced and persistent effect (more than ten years) on capital structure and leverage is significantly and negatively related to historical market valuations. Their evidence is based on a unique market timing measure: historical external finance weighted-average market-to-book ratio, which gives a higher weight to the equity issuance when firms raise most of their capital at high market valuations. Baker and Wurgler's (2002) market timing theory provides a new explanation for the slow adjustment of leverage towards firm's target level.[26] It not only challenges the prediction of the traditional trade-off theory that the market-to-book ratio only has a temporary impact on leverage, but also questions the prediction in the static version of pecking order theory that a higher market-to-book ratio will drive leverage up toward a debt capacity.

[26] Fama and French (2002) and Welch (2004) both report evidence of slow adjustment toward target leverage. Fama and French (2002) test the relationship between dividend payout and leverage ratios to compare different predictions of the trade-off model and pecking order model. They find that leverage ratios are mean reverting, consistent with the prediction in the trade-off model. However, the speed of mean reversion is very slow: 7-10% per year for dividend payers and 15%-18% for non-payers. Welch (2004) argues that stock return is the most important determinant of market-based debt ratios. He shows that, after controlling for the stock returns, other common determinants of capital structure exhibit a much lesser role in explaining the market-based debt ratios.

On the other hand, several recent papers challenge the timing measure and the results in Baker and Wurgler (2002). Kayhan and Titman (2005) develop two timing measures: yearly and long-term market timing. They argue that their yearly timing measure, calculated as the covariance between financial deficit and the market-to-book ratio, is very similar to the intuition of Baker and Wurgler (2002)'s timing measure. Their long-term timing measure, however, captures the essence that is not reflected in Baker and Wurgler (2002). It interacts a firm's financial deficit with its *average* market-to-book ratio over the sample period and, thus, it is likely to proxy for the underlying firm characteristics, such as historical average investment opportunities, and has nothing to do with the timing incentives. Surprisingly, Kayhan and Titman (2005) find that the long-term timing measure has a long-lasting impact on capital structure whereas the yearly timing measure only has a weak impact on the observed leverage ratios.[27]

Similarly, Alti (2005) also argues that the market timing measure in Baker and Wurgler (2002) is noisy because a firm's market-to-book ratio is not only affected by the firm-specific growth opportunity, but is also impacted by the aggregate economic environment as well as some industrial effects. Alti (2005) provides an alternative market timing measure that identifies market timers as those that go public in the 'hot' IPO market and the 'hot' and 'cold' markets are categorized based on the number of monthly IPOs. His market timing measure avoids the controversy on the market-to-book ratio, and provides a direct test on the time-varying mispricing and the time-varying adverse

[27] Leary and Roberts (2006) conduct a nonparametric analysis by dividing firms into four groups based on size (large or small) and the market-to-book ratio (high or low). They compare the leverage difference between equity issuers and non-issuers. Their evidence, similar to that of Kayhan and Titman (2005), shows that firms with high historical market-to-book ratios tend to have low leverage ratios in the long-run. They also find that within four years of equity issuance, the issuers in all four groups have rebalanced away the effects of the issuance.

selection costs in the equity markets. He finds that firms do take advantage of hot equity markets. The hot-market issuers raise more proceeds and, consequently, experience a larger decline in the leverage ratios in the IPO year, compared to the cold-market issuers. Moreover, hot-market issuers raise more equity than their capital needs, and the additional proceeds primarily increase their cash and short-term investments balance. However, he documents that within a few years following the IPO, hot-market firms issue more debt and less equity than cold-market firms do. As a result, the hot-market effect on leverage completely disappears after two years following the IPO.

Leary and Roberts (2006) argue that Baker and Wurgler (2002) ignore the fact that rebalancing of capital structure is costly. They suggest that the persistent market timing effect will decline as the adjustment costs related to debt issuance decrease. They show that for firms with lower debt issuance costs (proxied by lower estimated underwriter spreads, higher credit rating, and higher Altman's Z-Score), the persistent impact of Baker and Wurgler's (2002) market timing measure on leverage is less pronounced than for firms with higher debt issuance costs. Thus, their results more support the view of dynamic rebalancing of capital structure rather than the market timing theory.

4.2.2. Cross Listing and Market Timing

The above literature focuses on the market timing effect when firms time the *local* equity market. With the growing pace of globalization, firms will naturally exploit time-varying as well as country-varying financing opportunities. Cross-listed firms, in the context of listing in the US, should have better market timing opportunities than their

non-cross peers because of three main reasons that I summarize in the following paragraphs. They are better access to international capital markets, lower information asymmetry, and lower 'home bias' concerns and better corporate governance for cross-listed firms. I also discuss several related empirical findings in this section.

First, the literature suggests that although market segmentation has attenuated over the years, some barriers still exist that may cause segmentation across national capital markets (see for example, Mittoo (2003)). As a result, the cost of equity could differ across different markets even for securities with the same risk. The US has the largest and deepest capital market in the world. Cross-listed firms, who have access to both the domestic market and the US market, have more flexibility in deciding when and where to raise new capitals compared to their non-cross peers. When the US market is performing well whereas the domestic market is performing poorly, cross-listed firms can escape from the domestic market and choose to raise capital in the US market.

Second, cross listing on the US exchanges requires firms to conform to the US Generally Accepted Accounting Principles (GAAP) and to comply with all the SEC regulations. This substantially increases the information disclosure level for cross-listed firms and, consequently, lowers the concerns of information asymmetry between investors and managers. Baker, Nofsinger and Weaver (2002) and Lang, Lins and Miller (2003) find that firms' analyst coverage, forecast accuracy and media attention increase as a result of cross-listing. Myers and Majulf (1984) provide a time-varying asymmetric information argument - firms should time the equity market for periods when the level of information asymmetry is low. Thus, Myers and Majulf's argument could imply that, in

general, cross-listed firms, because of less information asymmetry problem, should have better timing opportunities than non-cross firms.

Third, listing in the US can alleviate the "home bias" of foreign investors. Merton's (1987) investor recognition theory suggests that firms that are better known face lower cost of capital and investors only invest in firms that they are familiar with. Holland and Warnock (2003) show that the most important determinant of a foreign firm's weight in the US portfolio is whether the firm is listed on a US exchange or not.[28] Furthermore, cross-listings also improve firms' corporate governance by enhancing the legal protection of minority shareholders and, thus, lower the agency costs of the firm (Coffee (2002)). For example, Doidge, Karolyi and Stulz (2004) argue that foreign firms, by listing in the US, commit that controlling shareholders will not exploit the private benefits of control rights and, thus, those cross-listed firms are worth more and they have a better chance to use valuable growth opportunities, compared to non-cross firms.[29] Reese and Weisbach (2002) also document that foreign firms substantially increase the number and proceeds of equity offerings following cross-listings. In sum, the lower 'home bias' and better corporate governance imply that cross-listed firms should have lower agency costs and should have better market timing opportunities in the US capital market.

There is no direct evidence on whether and to what extent cross-listed firms time the market. Several recent papers provide evidence on the market timing of cross-border

[28] King and Segal (2003) find that Canadian firms that cross-list on the US exchanges have a better valuation than non-cross firms. They contribute the better valuation to the stronger investor protection of the US security regulations. However, Canadian cross-listed firms trade in a discount compared to the similar US firms. They argue that cross listing cannot completely eliminate investors' home bias, and the source of the discount warrants further investigation.

[29] Doidge (2003) finds that cross-listings reduce the benefits of private control as the voting premium between the dual-class shares is much lower for foreign dual-class shares firms that cross-list on the US exchanges than for their non-cross peers.

issues but the evidence is not clear. Henderson, Jegadeesh and Weisbach (2005) examine the public security issuance activity around the world during the 1990-2001 period. They divide the sample into domestic and international offerings based on whether or not the proceeds are raised in a marketplace outside the issuer's home country, and test whether firms can successfully time the market by looking at the relationship between the aggregate equity (and debt) issues and the stock market return in each nation. Their evidence strongly supports the market timing story, and shows that firms are more likely to issue equity when the stock market appears to be overvalued and issue debt when the stock market is undervalued. More importantly, they find that foreign companies tend to issue equity in the US or UK when these markets are 'hot', and their market returns are low following periods of high equity issues from abroad. Pasquariello, Yuan, and Zhu (2006) argue that the condition of currency markets also strongly affects foreign firms' decisions of when to issue American Depositary Receipts (ADRs). Their evidence suggests that foreign firms tend to issue ADRs after the local currency has been abnormally strong against the US dollar, and before the local currency becomes weak. They argue that, by timing the currency markets, foreign ADR firms could benefit the existing local shareholders by raising US proceeds at a high valuation and later convert the proceeds into the local currency.

In contrast, Chaplinsky and Ramchand (2000) compare stock price reactions to the announcements of US global SEO offerings (a simultaneous sale of equity at the same price in the domestic and one or more foreign markets) with a group of domestic equity offerings. They posit that if global offerings are motivated to avoid the poor domestic market, they would observe global offerings to take place when the domestic stock

market is relatively underperforming than foreign markets. Their evidence, however, rejects this prediction and shows that global offers tend to occur when the US stock market is strong. Moreover, they find that the benefit of global offers, reflected in the more favourable stock price reactions to announcements, is mainly associated with the increase in the number of foreign investors, supporting Merton's (1987) investor recognition argument. Forester and Karolyi (1999) observe a pre-listing run-up and post-listing decline in the abnormal returns for the US ADRs from developed and developing countries. They argue that one possible explanation for this evidence is that firms may strategically time their listings and also issue more equity before the market observes their poor fundamental performance.

Overall, I predict that Canadian firms that cross-list on the US exchanges should have better opportunities to time the market, and they may do so by raising more equity proceeds than their domestic listed peers. However, whether and to what extent cross-listed firms take advantage of the market timing opportunity is an empirical question and I will offer evidence in the following sections. I would expect that, if there were a substantial market timing impact on capital structure for the Canadian firms, the impact would be more pronounced for the cross-listed ones.

4.3. Data and Sample Description

4.3.1. Data Sources

I draw the Canadian sample from four databases for the 1985-2003 period. I report the detailed sample selection procedure in Appendix 4.A1. First, I define a firm as a cross-lister (listed both on the Toronto stock exchange and one of the US three major

exchanges) if it reports trading information both in the Canadian Financial Markets Research Centre (CFMRC) database and the Center for Research in Security Prices (CRSP) database in the year when the firm issued an SEO. A firm is defined as a non cross-lister if it only reports trading information in the CFMRC database in the SEO year. This classification allows me to identify whether the firm is cross listed (or domestically listed) at the time of the SEOs. My sample does not include firms that list on the Canadian regional exchanges or the OTC markets because of the difficulty to obtain detailed stock and financial information for those firms.

Second, I collect equity issuance information from the Securities Data Company (SDC) Global New Issues database. I only include the SEOs by Canadian firms in the domestic and the US markets. I exclude IPO issuance because my main interest is on the cross-listed firms and they have usually issued IPOs before the cross-listing. Third, I draw firm-specific variables from the Compustat database. I merge the information from these four databases based on the firms' first 6-digit CUSIP number. To remain in the final sample for analysis, the following criterion also must be met:

(i) The firm is not in the financial sector (6000<= SIC code<=6999);

(ii) The firm must report the dollar amount of proceeds raised in this marketplace (Canada or the US);

(iii) The type of the SEO cannot be a purely secondary offering;

(iv) The firm must have complete firm-specific variables (e.g. firm size, market capitalization, profitability) in the pre-SEO year.

To make sure that I do not get duplicate observations in the multivariate analysis (e.g. some firms may have multiple SEOs in the same year), I manually choose the one

that has the largest proceeds within the same SEO year.[30] One exception is that if a firm offers SEOs both in the domestic and US markets at the same time, I choose the issue in the US market. By doing so, I keep the offerings that are most likely to time the market (because if the firm tries to time the market, the firm would most likely to issue a large amount of equity when the market condition and/or a firm's valuation is more favourable). It is possible that choosing the SEOs with larger offering amount may lead to an upward-bias on the impact of market timing. I check the robustness of the result by using a sample that allows multiple issues within the same year (N=735) and find that my conclusions do not change.

My final sample consists of 651 issues.[31] Cross-listed firms account for 28% (or 180) issues. Moreover, the number of issues increases over the years, and more than 95% (or 621) issues occurred in the post-1991 (the post Multijurisdictional Disclosure System (MJDS)) period.

4.3.2. Sample Description

I report summary statistics of the SEO issuance and selected firm characteristics in Table 4.1. Panel A breaks down the sample into hot- and cold-month issues. Similar to Alti (2005) and Henderson, Jegadeesh and Weisbach (2005), I use the aggregate activity of offerings in the respective market and month to proxy for the hot- and cold-month. I

[30] In my multivariate analysis, I use a 'hot' month dummy to identify whether a firm issues equity when the SEO market is hot. This 'hot' month dummy is based on the monthly volume of the aggregate SEO market and, thus, the value of this dummy could vary from month to month. If a firm issues multiple SEOs in the same year, it is possible that one issue is categorized as 'hot' and another issue is categorized as 'cold'. However, the regression analyses control for the yearly financial information and, therefore, it is possible to introduce a bias on the coefficient of 'hot' month dummy. Choosing the one with the largest proceeds is consistent with the market timing hypothesis and can partially eliminate the bias on the coefficient of hot month dummy when firm issues multiple SEOs within the same year.

[31] Among 651 issues, 56 issues are offered by utility firms. I find that my conclusions remain essentially the same if I remove these observations.

collect all SEO offerings in the Canadian and US markets between November 1984 and December 2003 from the SDC database, and calculate a three-month centered moving average (to account for the seasonal variation) of the number of SEOs for each month and for the Canadian and US markets separately. *Hot* (*Cold*) months are defined as those that are above (below) the median in the distribution of the calculated monthly average number of SEOs. Throughout the paper, I define that the dummy variable - HOT equals one if a firm issues an SEO in the hot month and zero in the cold month.

[Insert Table 4.1 about here]

I find that 56% (363/651) of issues occurred in the hot months. The average proceeds adjusted by firms' book (market) assets is much higher in the hot months and is significantly different from that in the cold months at the 1% level. This pattern also holds for the cross-listed and non-cross sub-samples, but the difference between hot and cold months is more pronounced for cross-listed firms, about twice of that for non-cross firms.

Furthermore, the majority (92%) of the sample SEOs were offered in the Canadian market, despite the implementation of the MJDS that had lowered the accounting and disclosure barriers for making cross-border equity issues in the US. This evidence suggests that Canadian firms meet most of their capital needs domestically, and is consistent with the evidence in Hendry and King (2004) that the average foreign new issues by Canadian firms were about 12% of their total new issues in the later half of the 1990s. More interestingly, I find that Canadian cross-listed firms account for all (50)

Canadian issues in the US. This evidence is similar to that of Mittoo (2006) and is consistent with Holland and Warnock's (2003) findings that the most important determinant of a firm's weight in the US portfolio is whether it is listed on a US exchange. Among the 50 issues, 76% (38/50) of them occurred in the hot months. The average and median proceeds adjusted by the firm's assets is about three times greater in the hot months than that in the cold months. However, the difference between the hot and cold months is less pronounced when the proceeds are adjusted by the market value of the firm in the pre-SEO year.

In panel B, I compare leverage ratios and several firm-specific factors that are commonly associated with leverage ratio between cross-listed and non-cross firms, and find that the most striking difference is in the firm size. For example, the average total assets ($millions) of a typical Canadian cross-listed firm is $1946.57M, about three times larger than that of a typical non-cross firm ($673.86M) ($p<0.01$). Moreover, cross-listed firms have significantly lower leverage than non-cross firms, consistent with the evidence in Pagano, Roell and Zechner (2002). Other firm-level variables, including market-to-book ratio (M/B), asset tangibility (PPE/A), and profitability (EBITDA/A) are very similar between cross-listed and non-cross firms.

4.4. Regression Analysis

4.4.1. Market Timing and Issuance Activity

To examine whether and to what extent Canadian firms time the markets, I use the following regression model (1):

$$\text{Proceeds}/A_{t-1}=\alpha+\beta_1 HOT+\beta_2(M/B)_{t-1}+\beta_3 SIZE_{t-1}$$
$$+\beta_4(PPE/A)_{t-1}+\beta_5(EBITDA/A)_{t-1}+\beta_6(D/A)_{t-1} \quad (1)$$

where $\text{Proceeds}/A_{t-1}$ denotes a firm's SEO proceeds in this market (collected from the SDC database) divided by the firm's total assets before the SEO year *t*. Since the regression is run on a cross-sectional basis, I estimate the model using White's (1980) procedure that adjusts for heteroskedasticity in standard errors. For brevity, I omit the subscript *i* (denotes i^{th} firm) in all regressions. I also control for the fixed industry effect by using firms' first three-digit SIC codes, and I do so in the remainder of Chapter 4. The coefficients on the industry dummies are not shown in the tables to conserve space.

Following the recent market timing literature, I include two market timing measures in the model. The first variable – HOT equals one if the SEO was offered in the hot SEO month and zero otherwise. The second variable – M/B, which is defined as the ratio of the market value of assets over book value of assets, is a more commonly used market timing measure (to save the space, I include the detailed variable definitions in Table 4.A1). Incorporating these two market timing variables in the model overcomes some criticisms towards the measure in Baker and Wurgler (2002), because a firm's market timing opportunity is not only affected by its firm-specific growth opportunity (as reflected in M/B) but is also impacted by the aggregate equity market activity (captured by the hot month effect). The market timing hypothesis predicts that the coefficients on HOT and M/B should be positive and significant because a firm should take advantage of the hot equity market and the high market valuation of the firm to raise more proceeds.

The remaining control variables are fairly standard and widely used in many prior studies (see for example, Rajan and Zingales (1995)). Firm size (SIZE) is defined as the

natural logarithm of total sales. The ratio of net plant and equipment over total assets (PPE/A) is a proxy for the asset tangibility. EBITDA/A is defined as the ratio of earnings before interest, tax, depreciation and amortization over total assets, and is a measure of firm's profitability. D/A is the ratio of book debt over total assets. All firm-specific factors use the *t-1* values.

[Insert Table 4.2 about here]

The first two columns in Table 4.2 report the results of market timing on issuance activity without differentiating between cross-listed and non-cross firms. I find that before introducing the hot month effect, the coefficient on M/B_{t-1} is positive (0.032) and significant at the 5% level (t=2.26), consistent with the market timing hypothesis. SIZE is also significantly related to the issuance amount but the coefficient is negative (-0.088, t=-3.27). This result is not surprising given that the dollar amount of proceeds is adjusted by the total assets. In column (2), I introduce the hot month dummy, in addition to the M/B_{t-1}. The coefficient on HOT is positive (0.104) and significant at the 1% level (t=2.89). The magnitude of the coefficient on M/B_{t-1} and its significance level remain almost the same. I also test the joint significance of HOT and M/B_{t-1}, and find a high F-value of 11.24 (result is not tabulated), indicating that two market timing measures are jointly significant at less than 1% level, and this finding supports the prediction of the market timing hypothesis.[32]

[32] The correlation between HOT and M/B_{t-1} is very low (about -0.01). Thus, including these two variables in the regression is not likely to create a multicollinearity problem.

Next, I test whether cross-listed firms are more involved in market timing and, consequently, issue more equity than their non-cross peers. I do this analysis by using regression (2):

$$\text{Proceeds}/A_{t-1}=\alpha+\lambda_1 CROSS+\lambda_2 HOT\times CROSS+\lambda_3 (M/B)_{t-1}\times CROSS+\beta_1 HOT$$
$$+\beta_2 (M/B)_{t-1}+\beta_3 SIZE_{t-1}+\beta_4 (PPE/A)_{t-1}+\beta_5 (EBITDA/A)_{t-1}+\beta_6 (D/A)_{t-1} \quad (2)$$

where CROSS equals one if it is a cross-listed firm at the time of SEO issuance and zero otherwise. My interest is in the coefficients on CROSS and the two interactive terms – HOT×CROSS and M/B_{t-1}×CROSS.

The result in column (3) of Table 4.2 shows that cross-listed firms raise substantially more proceeds than non-cross firms, after controlling for market timing and several firm-specific factors. The coefficient on CROSS is 0.193 and significant at the 1% level (t=3.15), indicating that the status of cross-listing is a very important determinant of the amount of proceeds that the firm is able to raise. The results in columns (4) to (6) discriminate whether the hot month effect or the high market valuation of the firm causes the cross-listed firm issue more equity. I find that the coefficients on HOT×CROSS and M/B_{t-1}×CROSS are not significant at any level. The magnitude of the coefficient on M/B_{t-1}×CROSS is much smaller than that of HOT×CROSS.

4.4.2. The Short- and Long-term Impacts of Market Timing on Capital Structure

The prior studies consistently document that there is a strong short-term impact of market timing on capital structure. However, whether this impact is long-lasting is an unsettled issue. For instance, Baker and Wurgler (2002) document that the market timing

effect lasts more than ten years whereas Alti (2005) shows that this effect vanishes after two years. Moreover, the previous evidence is largely based on the US IPOs. Whether the US findings are also applicable to the SEOs in other countries is not well explored. To fill the gap, I use a framework similar to that of Baker and Wurgler (2002) and Alti (2005) and do the analysis for the Canadian SEOs.

4.4.2.1. The Short-term Impact

The following regression (3) tests the short-term impact of market timing on capital structure:

$$D/A_t - D/A_{t-1} = \alpha + \beta_1 HOT + \beta_2 (M/B)_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 (PPE/A)_{t-1} + \beta_5 (EBITDA/A)_{t-1} + \beta_6 (D/A)_{t-1} \quad (3)$$

where $D/A_t - D/A_{t-1}$ represents the change in book leverage ratio from the pre-SEO year to the SEO year. The market timing hypothesis predicts that the coefficients on HOT and M/B_{t-1} should be negative because the firm takes advantage of the market timing opportunity to issue more equity and, as a result, the firm's book debt ratio should decline after equity issuance.

[Insert Table 4.3 about here]

My results in Table 4.3 suggest that there is a weak short-term impact of market timing on capital structure for the Canadian firms. In column (1), the coefficients on HOT and M/B_{t-1} are negative, but only M/B_{t-1} is significant at the 5% level (t=-2.02). This

result is weaker than the previous US findings but is not surprising. The primary reason for the difference in results is that I use SEO events whereas the prior US studies examine IPO samples. For the IPO samples, a large portion of total assets might be composed of debt prior to the IPO. Once a firm goes to the public equity market, the weight of book equity in the balance sheet will increase substantially and, as a result, the book debt ratio will drop significantly. By contrast, the new equity raised by the SEOs will moderately increase the book equity weight, but the increase will be much smaller than in the case of IPOs. The data supports this line of reasoning. In Baker and Wurgler (2002), for instance, the average book leverage ratio in the pre-IPO year is 66.54% and it drops sharply to 43.17% in the IPO year. In my sample, the average book leverage ratio in the pre-SEO year is 45.19% and it drops to 40.49% in the SEO year.

I introduce the CROSS dummy in column (2). The regression shows that in the SEO year cross-listed firms significantly decrease their book debt ratios by 5.3% more than non-cross firms, after controlling for the impact of market timing and other leverage determinants (the coefficient on CROSS=-0.053 and t=-2.55). This result is consistent with the finding in Table 4.2 that cross-listed firms raise more equity proceeds than non-cross firms. This result is not confounded by the fact that cross-listed firms normally have lower leverage ratios than non-cross firms in the pre-SEO year, since I have included the firm's leverage ratio in the pre-SEO year in the regression. The coefficient on D/A_{t-1} is negative (-0.540) and significant at the 1% level (t=-3.84), indicating that the decline of the book leverage ratio in the SEO year is much larger for the firms with higher debt ratios in the pre-SEO year. In column (3) I test whether the short-term impact of market timing on capital structure is different between the cross-listed and non-cross firms. My

result, however, indicates the effect is similar between the two groups of firms as the coefficients on HOT×CROSS and M/B_{t-1}×CROSS are not significant at any level.

Following Baker and Wurgler (2002), I further test the proposition that market timing impacts the change in book leverage ratio through the net equity issuance. I decompose the book debt ratio into three components: net equity issuance, newly retained earnings and growth in assets:

$$(D/A)-(D/A)_{t-1}= -(e/A)_t-(\Delta RE/A)_t-[E_{t-1}*(1/A_t-1/A_{t-1})] \quad (4)$$

where e, RE and E represent net equity issuance, retained earnings and book equity, respectively. I then use these components as alternative dependent variables in replace of $(D/A)-(D/A)_{t-1}$ in regression (3).

My results are largely consistent with Baker and Wurgler (2002) and suggest that the short-term effect of market timing on capital structure is mainly from the net equity issuance. The regression in column (4) shows that firms with higher market-to-book ratios significantly increase the weight of net equity issue in total assets in the SEO year.[33] The second important effect is through the growth in assets, which includes a combination of debt and equity issuance as well as newly retained earnings, because the coefficient on M/B_{t-1} in column (6) is positive (0.020) and significant at the 1% level (t=2.87). However, the coefficient on HOT is not significant at any level, suggesting that the main effect of market timing on capital structure is primarily driven by the market-to-book ratio and is consistent with the result in column (1). Through columns (7) to (9) I

[33] Since the dependent variable is $-(e/A)_t$ in column (4), the negative (-0.065) and significant (t=-2.92) coefficient on M/B_{t-1} represents a strong positive relation between the market-to-book ratio and net equity issuance.

examine whether the impact of market timing on the three components of leverage change is different between cross-listed and non-cross firms. My results show that this impact is very similar between the two groups of firms. The coefficients on HOT×CROSS are not significant at any level. The coefficients on M/B_{t-1}×CROSS are weakly significant under column (7) (t=-1.69) and column (9) (t=1.89).

In summary, I document a weak short-term market timing impact on firms' capital structure for Canadian SEOs. Moreover, cross-listed firms, in contrast to their domestically listed peers, exhibit a larger decrease in book leverage ratio in the SEO year. The short-term impact of market timing (as proxied by hot month dummy and book-to-market ratio) on leverage, however, is not significantly different between cross-listed and non-cross firms.

4.4.2.2. The Long-term Impact

In the post-SEO period, the book leverage ratio of my sample firms exhibits a slight increase. For instance, the average (median) book leverage ratios in the SEO+1, SEO+2 and SEO+3 year are 42.24% (42.59%), 43.08% (43.73%), and 44.80% (43.97%), respectively, in contrast to 40.47% (40.61%) in the SEO year. This pattern also holds for the sub-samples of cross-listed and non-cross firms.[34]

In this section, I examine whether there is a persistent market timing impact on firms' leverage. I do this analysis by including the hot month dummy and Baker and Wurgler's (2002) 'external finance weighted-average' market-to-book ratio (M/B_{efwa}) in the regression (5). I also include the CROSS dummy to separate the effect between the

[34] The average book debt ratios for the cross-listed firms in the SEO+1, SEO+2 and SEO+3 year are 36.87%, 38.68% and 39.95%, respectively. The ratios for the non-cross firms are 44.27%, 44.75% and 46.86% in the three years window, respectively.

cross-listed and non-cross firms. It is important to note here that, if I observe a significant long-term market timing effect, it does not necessarily imply that market timing is the only explanation. Several recent papers suggest that the inertia of leverage adjustment over the time could be also due to the adjustment costs of capital structure (see for example, Leary and Roberts (2006)). My goal is to document whether there is a long-term effect, rather than discriminating among alternative explanations. I estimate the following regression (5) and reports result for a two-year window (SEO+1, SEO+2) in Table 4.4. To save the space, I do not report the results for a longer period (e.g. SEO+3 to +5 years) because I find that the results are very similar.

$$D/A_t - (D/A)_{pre\_SEO} = \alpha + \beta_1 HOT + \beta_2 (M/B)_{efwa} + \beta_3 (M/B)_{t-1} + \beta_4 CROSS + \beta_5 SIZE_{t-1} + \beta_6 (PPE/A)_{t-1} + \beta_7 (EBITDA/A)_{t-1} + \beta_8 (D/A)_{pre\_SEO} \quad (5)$$

The results in columns (1) and (2) of Table 4.4 show that market timing has no cumulative impact on the book leverage ratio in one or two years following an SEO, as the coefficients on HOT and M/B_{efwa} are not significant at any level. Moreover, I do not find that the coefficients on CROSS are significant, indicating that the leverage increment after the SEO year is similar between cross-listed and non-cross firms. I also run regressions that differentiate the impact of market timing on the change of leverage between the two groups of firms. In columns (3) and (4), the coefficients on HOT×CROSS and M/B_{efwa}×CROSS are not significant, implying that the long-term impact of market timing is similar between cross-listed and non-cross firms.

[Insert Table 4.4 about here]

To check the robustness of the results, I replace the dependent variable of the cumulative change in leverage in regression (5) with the book leverage ratio in the SEO+1 or SEO+2 year. If market timing has a persistent impact on leverage, I would observe that the market timing measures have significant and negative impacts on the cross sectional leverage ratios. The results are reported in columns (5) through (8).

I find that the coefficients on HOT and M/B_{efwa} are not significant at any level, indicating that the market timing measures still do not have a significant role in explaining the leverage ratio in the long run. Interestingly, the coefficient on CROSS in the SEO+1 year is -0.072 (t=-1.81, column (5)). The same coefficient in the SEO+2 year becomes much smaller (-0.048) and loses significance (t=-1.53, column (6)). I run the same regression for the SEO year and find this coefficient is -0.085 (t=-3.50, result is not tabulated). This result and the findings in section 4.4.2 suggest that the cross-listed firms significantly decreased leverage ratio in the SEO year, compared to non-cross firms. However, the leverage difference between two groups of firms diminishes after the SEO year. I also interact HOT and M/B_{efwa} with CROSS in columns (7) and (8), but do not find any significance on the interactive terms.

4.5. Summary and Conclusions

Whether and to what extent equity market timing has a short-term or long-term impact on firms' capital structure has received increased attention from researchers, but the evidence is still under debate. The prior literature largely uses US IPO samples, and

very little is known about whether the findings in the US are also applicable to other countries and non-IPO samples. In this study, I examine the impact of market timing on capital structure for a sample of Canadian firms that issued SEOs during the period of 1985-2003, and make two main contributions to the existing market timing literature.

First, my results enhance the understanding of whether market timing has a similar impact on capital structure in a different country setting and SEO issues. Second, I compare the market timing effect between Canadian cross-listed and non-cross firms. This perspective is unique and interesting because cross-listed firms, in contrast to their non-cross peers, have high potential to explore the market timing opportunity and have more flexibility in deciding when and where to raise new capital.

My evidence shows that there is a weak short-term effect for Canadian SEOs but no long-term effect of market timing on capital structure. I find that the short-term market timing effect is mainly reflected in the market-to-book ratio rather than the 'hot' month dummy. I also document that the short-term impact is mainly from the net equity issuance, supporting the market timing hypothesis and this is consistent with Baker and Wurgler (2002). However, there is mixed evidence on the market timing effect between the cross-listed and non-cross sub-samples. I find that cross-listed firms raise substantially more proceeds, after controlling for the 'hot' month effect, market-to-book ratio as well as several firm-specific variables. However, I do not find a statistically significant difference between cross-listed and non-cross firms in the short-term and long-term impacts of market timing on capital structure.

To have a complete picture on how firms time the markets and the related financial implications, either in a short- versus long-run horizon or in a domestic versus

international perspective, is a challenging task. Moreover, one of my interesting findings in this Chapter is that there is no strong difference in taking advantage of the market timing opportunity between Canadian cross-listed and non-cross firms. One might wonder what real benefits the cross-listed firms are receiving, considering the substantial costs of cross-listing. I suggest that more future research should be done in this area.

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Table 4.1. Summary Statistics of SEO Issuance and Firm Characteristics

Panel A: Issuance Characteristics

	All (N=651)			Hot Market (N=363)			Cold Market (N=288)			*p*-value	
	N	Mean	Median	N	Mean	Median	N	Mean	Median	*t*	*Wilcoxon*
$Proceeds_t/A_{t-1}$	651	0.28	0.12	363	0.34	0.13	288	0.21	0.11	<0.01	0.03
- Cross	180	0.30	0.12	108	0.37	0.11	72	0.18	0.13	<0.01	0.48
- Non-Cross	471	0.28	0.12	255	0.32	0.14	216	0.22	0.10	0.04	0.03
$Proceeds_t/MV_{t-1}$	651	0.22	0.12	363	0.27	0.13	288	0.16	0.11	<0.01	<0.01
- Cross	180	0.22	0.12	108	0.28	0.13	72	0.14	0.10	<0.01	0.04
- Non-Cross	471	0.22	0.12	255	0.27	0.14	216	0.17	0.11	0.04	0.03
$Proceeds_t/A_{t-1}$ (US Markets)$^+$	50	0.44	0.19	38	0.53	0.21	12	0.17	0.07	<0.01	0.05
$Proceeds_t/MV_{t-1}$ (US Markets)$^+$	50	0.25	0.14	38	0.27	0.15	12	0.17	0.05	0.28	0.05

$^+$All 50 issues in US Markets are from the cross-listed firms.

Panel B: Firm Characteristics

	All (N=651)		Cross (N=180)		Non-Cross (N=471)		*p*-value	
	Mean	Median	Mean	Median	Mean	Median	*t*	*Wilcoxon*
D/A_{t-1}	0.45	0.44	0.41	0.37	0.47	0.46	0.02	<0.01
$D/A_t - (D/A)_{t-1}$	-0.05	-0.03	-0.06	-0.04	-0.04	-0.02	0.51	0.06
$Assetst_{t-1}$($M)	1025.76	180.43	1946.57	315.89	673.86	139.38	<0.01	<0.01
$(M/B)_{t-1}$	2.19	1.39	2.04	1.43	2.25	1.39	0.27	0.80
$(PPE/A)_{t-1}$	0.48	0.49	0.46	0.52	0.48	0.46	0.38	0.37
$(EBITDA/A)_{t-1}$	0.04	0.10	0.03	0.09	0.04	0.10	0.84	0.06

Summary statistics for a sample of Canadian firms that issued SEOs during the period of 1985-2003. $Proceeds_t$ is defined as the dollar amount (in $millions) offered in this market in the SEO year *t*. A is the book value of total assets (in million $). MV is the market value of total assets (in million $). Hot (cold) months are defined as the month that the SEO was issued is above (below) the median in the distribution of the monthly average number (seasonally adjusted) of SEOs during the period of November 1984 to December 2003. A firm is defined as cross-listed if it reports trading information both in the CFMRC and the CRSP databases in the SEO year. A firm is defined as non cross-listed if it only reports trading information in the CFMRC database in the SEO year. D/A is the ratio of book debt over book value of total assets. M/B is the market-to-book assets ratio. PPE/A is the ratio of net plant and equipment over total assets. EBITDA/A is the ratio of earnings before interest, tax, depreciation and amortization over total assets. The subscripts *t* and *t-1* are the SEO year and pre-SEO year, respectively. *t*-tests (*Wilcoxon* rank sum z tests) are used to test the difference in mean (median) value.

Table 4.2. Market Timing Effects on Issue Activity

	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.758	0.699	0.720	0.744	0.720	0.743
	(5.05)***	(4.87)***	(4.84)***	(5.23)***	(4.83)***	(5.22)***
HOT		0.104	0.102	0.066	0.102	0.066
		(2.89)***	(2.83)***	(1.38)	(2.85)***	(1.38)
CROSS			0.193	0.114	0.182	0.101
			(3.15)***	(1.48)	(2.18)**	(1.08)
*HOT*CROSS*				0.132		0.132
				(1.61)		(1.62)
M/B_{t-1}*CROSS*					0.004	0.005
					(0.15)	(0.19)
M/B_{t-1}	0.032	0.033	0.032	0.032	0.032	0.032
	(2.26)**	(2.41)**	(2.40)**	(2.37)**	(2.30)**	(2.27)**
$SIZE_{t-1}$	-0.088	-0.086	-0.098	-0.097	-0.098	-0.097
	(-3.27)***	(-3.26)***	(-3.45)***	(-3.40)***	(-3.42)***	(-3.37)***
PPE/A_{t-1}	-0.315	-0.304	-0.314	-0.319	-0.312	-0.318
	(-1.52)	(-1.47)	(-1.55)	(-1.57)	(-1.52)	(-1.55)
$EBITDA/A_{t-1}$	-0.276	-0.282	-0.267	-0.271	-0.269	-0.273
	(-1.20)	(-1.23)	(-1.18)	(-1.20)	(-1.18)	(-1.20)
D/A_{t-1}	0.037	0.028	0.050	0.054	0.050	0.054
	(0.19)	(0.14)	(0.27)	(0.29)	(0.27)	(0.29)
N	651	651	651	651	651	651
R^2	0.29	0.30	0.32	0.32	0.32	0.32

Regression analysis with robust standard errors (White, 1980) for a sample of Canadian firms that issued SEOs during the period of 1985-2003. The dependent variable - $Proceeds_t$ is defined as the dollar amount (in $millions) offered in this market in the SEO year *t*. HOT equals to one if the SEO is issued in a hot month, and zero otherwise. CROSS equals one if the firm is cross-listed, and zero if domestically listed. M/B is the market-to-book assets ratio. SIZE is the natural logarithm of total sales. PPE/A is the ratio of net plant and equipment over total assets. EBITDA/A is the ratio of earnings before interest, tax, depreciation and amortization over total assets. All explanatory variables, except HOT and CROSS, use the pre-SEO value. I control for the fixed industry effect by including firms' first three-digit SIC code. The coefficients on the industry dummies are not reported in the table, but are available upon request. The *t*-values are reported in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 4.3. The Short-Term Impact of Market Timing on Capital Structure

	$D/A-D/A_{t-1}$	$D/A-D/A_{t-1}$	$D/A-D/A_{t-1}$	Net equity issuance	Newly retained earnings	Growth in assets	Net equity issuance	Newly retained earnings	Growth in assets
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	0.088	0.082	0.091	-0.444	0.145	0.387	-0.441	0.136	0.396
	(1.77)*	(1.64)	(1.78)*	(-3.47)***	(1.01)	(4.71)***	(-3.66)***	(1.02)	(4.71)***
HOT	-0.012	-0.011	-0.023	0.050	-0.072	0.010	0.037	-0.065	0.005
	(-0.96)	(-0.92)	(-1.61)	(1.03)	(-1.51)	(0.38)	(0.75)	(-1.30)	(0.16)
CROSS		-0.053	-0.042				-0.014	-0.053	0.025
		(-2.55)**	(-1.29)				(-0.17)	(-0.55)	(0.52)
*HOT*CROSS*			0.038				0.040	-0.019	0.017
			(1.29)				(0.34)	(-0.16)	(0.37)
M/B_{t-1}**CROSS*			-0.014				-0.045	0.011	0.021
			(-1.58)				(-1.69)*	(0.40)	(1.89)*
M/B_{t-1}	-0.006	-0.006	-0.005	-0.065	0.039	0.020	-0.061	0.038	0.018
	(-2.02)**	(-1.98)**	(-1.48)	(-2.92)***	(1.73)*	(2.87)***	(-2.78)***	(1.69)*	(2.69)***
$SIZE_{t-1}$	0.007	0.011	0.010	0.049	-0.020	-0.022	0.052	-0.017	-0.025
	(1.09)	(1.51)	(1.37)	(2.91)***	(-1.30)	(-2.72)***	(2.62)***	(-0.89)	(-2.98)***
PPE/A_{t-1}	0.073	0.076	0.070	0.342	-0.242	-0.027	0.331	-0.236	-0.026
	(1.44)	(1.53)	(1.43)	(1.61)	(-1.20)	(-0.32)	(1.63)	(-1.22)	(-0.30)
$EBITDA/A_{t-1}$	0.154	0.150	0.155	-0.442	0.301	0.296	-0.430	0.293	0.293
	(1.25)	(1.21)	(1.25)	(-0.68)	(0.47)	(2.51)**	(-0.66)	(0.45)	(2.44)**
D/A_{t-1}	-0.533	-0.540	-0.539	-0.012	-0.245	-0.276	-0.024	-0.251	-0.265
	(-3.79)***	(-3.84)***	(-3.86)***	(-0.06)	(-1.57)	(-3.44)***	(-0.13)	(-1.59)	(-3.16)***
N	643	643	643	643	643	643	643	643	643
R^2	0.62	0.62	0.63	0.13	0.10	0.24	0.14	0.10	0.26

Regression analysis with robust standard errors (White, 1980) for a sample of Canadian firms that issued SEOs during the period of 1985-2003. D/A is the ratio of book debt over book value of total assets. *t* represents the SEO year. e, RE and E represent net equity issuance, retained earnings and book equity, respectively. HOT equal one if the SEO is issued in a hot month, and zero otherwise. CROSS equals one if the firm is cross-listed, and zero if domestically listed. M/B is the market-to-book assets ratio. SIZE is the natural logarithm of total sales. PPE/A is the ratio of net plant and equipment over total assets. EBITDA/A is the ratio of earnings before interest, tax, depreciation and amortization over total assets. All explanatory variables, except HOT and CROSS, use the pre-SEO value. I control for the fixed industry effect by including firms' first three-digit SIC code. The coefficients on the industry dummies are not reported in the table, but are available upon request. The *t*-values are reported in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 4.4.The Long-Term Impact of Market Timing on Capital Structure

	D/A_t-D/A_{pre_SEO}				D/A_t			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	0.108	0.228	0.123	0.243	0.205	0.298	0.211	0.304
	(1.25)	(3.30)***	(1.35)	(3.44)***	(2.79)***	(4.33)***	(2.62)***	(4.33)***
HOT	0.019	-0.029	0.002	-0.043	0.024	-0.027	0.009	-0.038
	(1.17)	(-1.62)	(0.12)	(-2.09)**	(1.27)	(-1.43)	(0.44)	(-1.68)*
M/B_{efwa}	-0.003	-0.000	-0.003	-0.001	-0.002	0.000	-0.002	0.000
	(-1.08)	(-0.19)	(-1.17)	(-0.55)	(-0.73)	(0.24)	(-0.68)	(0.28)
MB_{t-1}	0.002	-0.004	0.001	-0.006	0.003	-0.005	0.004	-0.006
	(0.16)	(-0.73)	(0.04)	(-0.99)	(0.21)	(-0.84)	(0.23)	(-0.72)
CROSS	-0.044	-0.036	-0.093	-0.090	-0.072	-0.048	-0.091	-0.070
	(-1.15)	(-1.26)	(-1.94)*	(-2.09)**	(-1.81)*	(-1.53)	(-1.69)*	(-1.48)
*HOT*CROSS*			0.064	0.052			0.053	0.042
			(1.40)	(1.19)			(1.01)	(0.91)
M/B_{efwa}*CROSS*			0.004	0.006			-0.004	-0.000
			(0.40)	(0.80)			(-0.32)	(-0.03)
$SIZE_{t-1}$	0.032	0.036	0.032	0.036	0.040	0.039	0.040	0.039
	(3.87)***	(5.68)***	(3.90)***	(5.64)***	(5.46)***	(5.63)***	(5.42)***	(5.57)***
PPE/A_{t-1}	0.192	0.174	0.190	0.172	0.255	0.228	0.254	0.227
	(2.39)**	(2.92)***	(2.38)**	(2.89)***	(2.62)***	(3.43)***	(2.62)***	(3.41)***
$EBITDA/A_{t-1}$	-0.218	-0.224	-0.221	-0.228	-0.188	-0.239	-0.186	-0.239
	(-1.66)*	(-2.25)**	(-1.70)*	(-2.30)**	(-1.28)	(-2.08)**	(-1.30)	(-2.09)**
D/A_{pre_SEO}	-0.639	-0.764	-0.634	-0.755				
	(-3.71)***	(-7.70)***	(-3.74)***	(-7.82)***				
N	549	461	549	461	549	461	549	461
R^2	0.47	0.67	0.47	0.67	0.40	0.47	0.40	0.47

Regression analysis with robust standard errors (White, 1980) for a sample of Canadian firms that issued SEOs during the period of 1985-2003. D/A is the ratio of book debt over book value of total assets. *t* represents the SEO year. Pre_SEO represents the value in the pre-SEO year. HOT equals one if the SEO is issued in a hot month, and zero otherwise. CROSS equals one if the firm is cross-listed, and zero if domestically listed. M/B is the market-to-book assets ratio. SIZE is the natural logarithm of total sales. PPE/A is the ratio of net plant and equipment over total assets. EBITDA/A is the ratio of earnings before interest, tax, depreciation and amortization over total assets. I control for the fixed industry effects by including firms' first three-digit SIC code. The coefficients on the industry dummies are not reported in the table, but are available upon request. The *t*-values are reported in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 4.A1. Variable Definitions

Variable	Definition	Data Source
CROSS	Cross-listing Dummy: equals to one if the firm is cross-listed on the TSX and major US exchanges and zero if it is listed on the TSX in the SEO year.	CRSP and CFMRC
HOT	Hot month dummy: equals to one if the SEO is issued in a 'hot' SEO month, and zero if the SEO is issued in a 'cold' SEO month. The 'hot' and 'cold' months are based on the monthly number of SEO issuers in this market.	SDC
Proceeds	The amount of proceeds in this market (in $M)	SDC
A	Book value of total assets (in $M)	Compustat
MV	Market value of the firm (in $M): Common Shares Outstanding (M)*Price (Fiscal Year Close in $)	Compustat
D	Book debt: Liability plus preferred stock minus deferred taxes and convertible debt. Use the value of deferred taxes and investment tax credit if the value of preferred stock is not available.	Compustat
M/B	Market-to-book assets ratio: the ratio of the sum of book debt and market value of firm over the book value of total assets	Compustat
SIZE	Natural log value of sales	Compustat
PPE/A	The ratio of net property, plant and equipment over the book value of total assets	Compustat
EBITDA/A	The ratio of operating income before depreciation over the book value of total assets	Compustat
D/A	The ratio of book debt over the book value of total assets	Compustat
RE	Retained earnings	Compustat
e	Net equity issue: the change in book equity minus the change in retained earnings	Compustat
d	Net debt issue: the change in book assets minus the change in book equity	Compustat
M/B_{efwa}	Baker and Wurgler's (2002) 'external finance weighted average' market-to-book ratio	Compustat

Appendix 4.A1. Sample Selection

My sample selection process involves four main steps:

(1) Collect cross-listing information. Canadian firms tend to do ordinary listing on the US exchanges and they must arrange for an exact replication of settlement facilities (Karolyi (1998)). Thus, the cross-listing status should be reflected in the trading data. I collect a list of firms that have common equity traded on Toronto stock exchange (TSX) and a sub-sample of firms that also cross list on one of the three major US exchanges (NYSE, AMEX, and NASDAQ) from the Canadian Financial Markets Research Centre (CFMRC) database and the Center for Research in Security Prices (CRSP) database. CFMRC database only includes equity that traded on the TSX and it does not include equity that listed on the TSX Venture Exchange. A firm is defined as listing on the TSX if it reports trading information (e.g. positive trading volume) in the CFMRC database in the respective year.[35] A firm is defined as a cross-lister if the firm reports trading information in both the CFMRC and the CRSP databases in the respective year. For the period of 1985-2003, I have 21,581 firm-year observations traded on the TSX. This information is consistent with the data from World Federation of Exchange (www.fidv.com). For the same time period, I have a sub-sample of 2,874 firm-year cross-listed observations. I also verify the cross-listing data with a manually complied dataset that consists information from historical TSE Review magazines and from the lists provided by the NYSE, AMEX, and NASDAQ websites.

(2) I draw a sample of common equity offerings from the Securities Data Company (SDC) Global New Issues database provided by Thomson Financial. The SDC new issues data provides a comprehensive coverage on offering terms, underwriters as well as SEC filing information on corporate new issues activities. I get an initial dataset of 9,076 Canadian common equity offerings (IPOs and SEOs) that were issued on the Canadian (N=8,883) and US (N=233) public equity markets for the period of 1985-2003. I further drop 1,569 issues by financial firms (the main SIC codes ranging from 6000-6999). I am left with 7,507 issues.

(3) I merge the listing and the issuance data. The initial merge is based on the calendar year and the 6-digit CUSIP code. It results in 1,942 merged observations.[36] I further remove 14 observations with pure secondary offerings because they have no impact on firms' capital structure.

(4) I collect firms' annual financial information from the Compustat database and match it with the data from the Step (3). I require that for each issue it must reports the dollar amount of proceeds in this market and it must have complete information on several variables in the pre-SEO year. The firm-level variables are book debt ratio, total sales, net property, plant and equipment, market-to-book ratio and operating income before depreciation. I have 735 issues left after removing issues without or with incomplete financial information. I further remove issues that have multiple offers in the same year. My final sample has 651 SEOs.

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[35] I identify those non Canadian-based firms (e.g. Wal-Mart) from the CFMRC database, and remove them from the cross and non-cross lists.

[36] 5,565 issues are dropped due to changed CUSIP information or that the firms are only listed on the regional exchanges, such as Montreal Stock Exchange, Vancouver Stock Exchange, Alberta Stock Exchange and over-the-counter.

CHAPTER 5

GENERAL CONCLUSIONS

The prior studies on capital structure have not widely agreed to what extent country-specific factors affect firms' leverage ratios. This thesis contributes to this line of research by examining the impact of several factors, which are particularly related to the Canadian economy and capital markets, on the capital structure of Canadian corporations.

This thesis consists of three empirical essays. The first essay (Chapter 2) examines the capital structure of Canadian multinational corporations (MNCs) and domestic corporations (DCs). My evidence is opposite to the prior studies using US samples and shows that Canadian MNCs have higher leverage ratios than DCs. The higher leverage of Canadian MNCs is associated primarily with their geographic concentration in the US market; expanding into the global (non-US) markets has little impact on leverage. I also test whether the negative impact of the agency costs of debt and business risk on leverage are more pronounced for the Canadian MNCs' global (non-US) operations versus the US operations and, if so, which of the two effects is dominant. I show that the negative impact of agency costs of debt and business risk on leverage is more pronounced for Canadian MNCs' non-US operations compared to their US operations, and the agency costs of debt is the dominant factor. The positive impact of access to the US bond market is also larger for Canadian MNCs' US operations relative to the global operations. Moreover, the comparison with an industry and size matched US sample shows that the sensitivity of leverage to firm-specific factors also differs between the two country samples. In summary, the first essay suggests that future research on

MNCs' capital structure should differentiate MNCs' regional and global expansions. My evidence also suggests that the capital structure of MNCs is a complex interaction of home and host country factors as well as differences in the determinants of leverage across countries.

The second essay (Chapter 3) examines the capital structure supply-side effects. The prior capital structure literature focuses largely on the demand-side effects (e.g. firms with larger size, lower growth opportunity and lower business risk could have higher debt ratios), implicitly assuming that supply-side effects do not matter. A recent study by Faulkender and Petersen (2006) finds that the US firms with access to the public bond market, as measured by having a credit rating, have significantly higher leverage ratios than firms without access. I use a Canadian sample and find similar evidence to that of Faulkender and Petersen (2006). More importantly, I contribute to the existing literature by further emphasizing that the impact of bond market access on capital structure could vary between firms with different credit quality, and I predict that this impact could be more pronounced for low credit quality firms than for high credit quality firms. My results support the prediction and show that the significant impact of bond market access on leverage is driven primarily by the low credit quality firms. This result could be jointly determined by two reasons. First, Canadian low credit quality firms face more severe credit rationing than high credit quality firms. Therefore, the marginal benefit of access to the larger and well-developed high-yield bond market in the US is likely to be much higher for the low credit quality firms. Second, high credit quality firms are likely to be more concerned about maintaining their credit ratings (Kisgen (2005a)). They do not borrow aggressively, because doing so could lower their credit ratings and limit the future

availability of funds.

My third essay (Chapter 4) examines whether market timing has a short-term or long-term impact on firms' capital structure. The existing research on the market timing and capital structure largely use US IPO samples, and there is no consensus on whether market timing has a persistent impact on leverage. Also, there is limited evidence on whether the documented US results are applicable to a non-US country and non-IPO sample. I show that there is a weak short-term but no long-term effect of market timing on capital structure for a sample of Canadian firms that issued seasoned equity offerings (SEOs) during the 1985-2003 period. The short-term market timing effect is mainly reflected in the market-to-book ratio, and is largely from the net equity issuance, supporting the hypothesis of market timing and this is consistent with Baker and Wurgler (2002). Furthermore, I predict that Canadian firms that cross-listed on the US exchanges have better market timing opportunity, and they may do so by raising more equity proceeds than their domestically listed peers. My result shows that cross-listed firms do raise much more equity than non cross-listed firm. However, I find that there is no statistically significant difference between cross-listed and non cross-listed firms in the short-term and long-term impacts of market timing on capital structure.

Overall, this dissertation enhances the understanding of whether firms' regional expansion and global expansion, bond market access, as well as market timing and cross-listing have significant influence on capital structure decisions. I believe that my findings have direct implications for managers, investors and public policy makers.