How do Canadian mining, quarrying, and oil and gas extraction firms' characteristics explain their borrowing preference between privately and publicly offered bonds?

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Abstract

This study examines the bond issuance choice between private placement and public placement among 148 Canadian firms in the mining, quarrying, and oil and gas extraction sector over a sample period of 2006 – 2015. Firms that issued bonds during the sample period under analysis can be divided into three groups. Group 1 firms only issue bonds privately. Group 2 firms only issue bonds publicly and Group 3 firms issue bonds both publicly and privately. Overall, for Canadian mining, quarrying, and oil and gas extraction corporations, this paper shows that most of their characteristics cannot explain their borrowing preferences between privately and publicly offered bonds. In other words, firms from these sectors may consider other factors such as disclosure requirements to be the main determinants when making a borrowing choice.

1. Introduction

In this paper, I examine how Canadian mining, quarrying, and oil and gas extraction firms' characteristics explain their borrowing preference between privately and publicly offered bonds. In particular, I study why firms with access to both private and public markets issue bonds in private placements.

In Canada, corporations choose various instruments to seek external funds to finance their business needs. The main instruments can be categorized as loans, debt securities, and equity. In the past decade, the primary borrowing instrument for corporations was equity, which accounted for almost 50% of outstanding total borrowing instruments. The next two main instruments were loans and bonds. On average, they accounted for 22% and 19% of outstanding of total borrowing instruments respectively. As of December 2015, outstanding bonds issued by Canadian corporations were $580 billion in bonds.[1]

In addition, Firms not only have to make decisions about which type of instrument to choose when seeking external funds; they also need to choose which market to borrow from. More specifically, a firm can choose to issue bonds in a private placement or in a public placement.[2] Private placement means that bonds are issued to specified buyers through certain regulatory prospectus exemptions, while public placement means that bonds are issued though a Canada-wide offering where a firm must file a qualifying prospectus with a Canadian securities regulatory body. According to Carpentier and Suret (2009), private placements play an important

[1] Source: based on Bank of Canada data

[2] Public placement bonds are bonds that are offered to the public by corporations, while private placement bonds are bonds that are offered privately. Some previous studies use the term private debt which includes any debt not issued in public markets such as bank loans (e.g., Arena, 2010; Denis and Mihov, 2003). In this paper, the terms refer only to bonds issued in private placements.

role in providing external funds to Canadian corporations, especially to corporations in the resources and oil and gas sector. These authors show that Canadian mining companies represented over 50% of the world's listed mining companies at the end of 2004. More than 50% of Canadian issued private placements were made by companies in the resources and oil and gas sector. In this paper, of the 406 new bond issues I examine during a sample period of 2006 - 2015, more than half the bond issues are in private placements.

Many studies focused on firms' choices among different instruments, but it is also important to understand the structure of the debt between private and public placements. There have been a number of previous studies on the choice between private and public debt. Houston and James (1996) and Cantillo and Wright (2000) report a negative relationship between firms' characteristics such as size and amount issued with private debt issuances. Krishnaswami et al. (1999) examine the cross-sectional variation of the debt placement structure and show that firms with more growth options in their investment opportunity set are more likely to issue private debt. Gomes and Phillips (2012) study why firms issue different security types between private and public markets and argue that firms with higher risks and lower profitability are more likely to issue private debt. Denis and Mihov (2003) examine the choice among bank debt, non-bank private debt and public debt and show that non-bank private debt provides the financing needs for firms with low credit quality.

The focus of prior studies has been on the U.S. firms and the markets in which the firms borrow funds. However, research on the bond placement choice in Canada is somewhat limited. Canadian credit markets are smaller than American credit markets, thus Canadian firms may face more financing constraints. In addition, there are differences in the type of investors in private placements between Canada and U.S.A. According to Carpentier and Suret (2009), the main

buyers of private placements in Canada are individual investors, while institutional investors are the main buyers in the U.S.A. These unique features in the Canadian financing environment provide an opportunity to analyze Canadian firms' borrowing preferences, given the importance of bonds in the financing of corporate activity in Canada. Using a sample that consists of 119 firms and a total of 217 privately and publicly offered bonds issued from January 1, 2006 through December 31, 2015, I extend this line of research by exploiting Canadian corporations in the mining, quarrying, and oil and gas extraction sector to shed light on their bond placement choices. To my knowledge, I believe this is the first paper to study the firms' bond borrowing choice between the two bond markets for Canada.

The remainder of this paper is organized as follows: Section 2 discusses existing studies and various empirical findings, Section 3 describes the data and methodology, Section 4 presents the results and discusses the robustness of the results, and Section 5 discusses conclusions based upon these results.

2. Literature review

Several studies attempt to explain the factors that influence the bond placement choice between private markets and public markets. Some of the key factors are the flotation costs of bond issues, the degree of information asymmetry between firms and investors, agency costs of bond issues, and credit risks. In the following section of this paper, I present evidence from previous studies on the importance of each factor that influences the choices that are made by issuers between public and private markets.

Flotation Costs

Flotation costs include expenses associated with bond issuances. Blackwell and Kidwell (1988, p.254) explain that "flotation costs for a debt issue consist of compensation paid to an investment banker (or other financial advisor) and out-of-pocket expense…which consist of legal fees, accountant's fees, trustee's fees, printing and engraving expenses." Previous studies suggest that the flotation costs for private placement bonds are less than for public placements bonds (e.g., Blackwell and Kidwell, 1988; Krishnaswami et al. 1999).

Firms will typically evaluate flotation costs together with the size of their issues. Blackwell and Kidwell (1988, p.255) explain that "a significant portion of flotation cost does not vary with issue size. Because this portion is larger for public issues, they have greater economies of scale…greater economies of scale for public issues suggest large debt issues will be sold publicly and small issues will be placed privately." This suggests that firms that issue small issues are more likely to choose to borrow from private markets.

Information Asymmetry

As part of the requirements to issue bonds to markets, firms need to provide a range of relevant information about themselves in order to reduce the asymmetry between borrowers and lenders, and to help investors make sound investment decisions. Private placements bonds are sold directly to investors without mandatory disclosure of firm-specific information. Carey et al. (1993, p.19) provide an explanation of the reason why some firms that usually issue public bonds might borrow from private markets from time to time. These authors claim that "such companies tend to issue straight debt in the public bond market but turn to the private placement market for complex transactions that public market investors are not well prepared to evaluate." This is consistent with the findings in Gomes and Phillips (2012), who show that firms are more likely

to switch to issuing in the private market from issuing in the public market when they experience increases in asymmetric information or risk.

Information asymmetry is measured by a set of firms' characteristics such as size and age. In my review of the literature, some researchers have hypothesized that larger and more reputable firms with longer financing history have less information asymmetry problems than younger and smaller firms and are more likely to issue public debt (e.g., Krishnaswami et al. 1999). Denis and Mihov (2003) use firm size and the fixed asset ratio as proxies for information asymmetry. They show that firm size and the fixed asset ratio are positively related to the likelihood of issuing public debt. On the other hand, Krishnaswami et al. (1999) use firm age to capture potential information asymmetry but find limited support on the impact of firm age on the choice of debt placement type.

Agency Costs

Agency costs are the expenses related to managing the relationship between principal and agent. These expenses arise from the fact that there could be potential conflicts between the two parties because of different motivations and incentives. In the case of bonds, the principal and agency relationship refers to the relationship between the bondholder and the trustee. Blackwell and Kidwell (1988) argue that agency costs are smaller when bonds are issued privately compared to when they are offered publicly. The reason is that private placement bonds may have more restrictive bond covenants between firms and a small group of investors, hence potential agency problems (conflicts) are less likely to arise. Blackwell and Kidwell (1988, p.257) suggest that "firms with more agency problems place debt privately because the lower agency costs outweigh the advantages of greater economies of scale in the public market."

Barclay and Smith (1995) argue that firms with more growth opportunities tend to have

greater conflict between firms and bondholders, which might lead to higher agency costs. Krishnaswami et al. (1999) show that firms with more growth opportunities benefit more from the monitoring associated with privately placed debt because monitoring and restrictive covenants of privately placed debt reduce the agency costs. Therefore, firms with more growth opportunities are more likely to issue private debt.

Credit Risks

Prior studies also examine U.S. firms' debt placement choice in the context of credit risks. Credit risks measure overall credit quality of the borrowers. The risks include default risk, credit spread risk, liquidation risk, and downgrade risk. Credit risks indicate the likelihood a firm will face financial distress when cannot repay its debt.

There have been a few studies focusing on the credit quality of the borrowers. Blackwell and Kidwell (1988) show that firms with a higher default-risk index are more likely to issue bonds in private placements. Previous studies (e.g., Easterwood and Kadapakkam, 1991) indicate that issuing bonds in private placements provides firms with the flexibility of renegotiating contracts with a small number of lenders. In case of default, firms may reschedule and renegotiate the debt payments.[3] Denis and Mihov (2003) use an incremental approach to study new debt issue decision and argue that issuers' credit quality plays an important role in determining whether firms borrow from public sources or from private lenders. They emphasize that non-bank private debt accommodates the borrowing needs of low credit quality firms.

Previous studies use several financial ratios to describe different aspects of a firm such as its profitability, leverage and liquidity. These aspects of a firm are used to evaluate a firm's credit

[3] Easterwood and Kadapakkam (1991) hypothesize that firms that issue private debt have higher flexibility to renegotiate their debt payments. However, their empirical analysis does not find support for this argument.

risks. Demerjian (2007, p.1) suggests "that financial ratios are informative of borrower credit risk…the commonly used covenant ratios capture these aspects of credit risk are: profitability and operating characteristics, total indebtedness (leverage), and short-term liquidity (current)." For example, Arena (2010) uses the return on asset ratio as a proxy for profitability and shows that private issuers are significantly less profitable than public issuers. Yu et al. (2008) use the leverage ratio as a proxy for firm liquidation risk and find a negative relation between a firm that issues public debt and its level of leverage.

In this paper, to study the relationship between the type of bond placement and firms' characteristics, I also employ a number of financial ratios as proxies for firms' characteristics. Individual financial ratio selected for this paper is discussed in details in the Section 3.3. These financial ratios are used to measure aspects of firms' characteristics that also capture the importance of flotation costs, information asymmetry, agency costs, credit risks and liquidity. The financial ratios that are used by previous studies as proxies for firms' characteristics vary from one study to another. There are several reasons why this paper chooses certain financial ratios as proxies for firms' characteristics. First, the availability of data for Canadian firms is limited. Previous studies use stock return volatility to indicate the degree of information asymmetry (e.g., Blackwell and Kidwell, 1988; Dhaliwal et al. 2004). These data require detailed debt securities information which is not currently available in Canada. Second, this paper attempts to follow Arena (2010) and Yu et al (2008) closely by employing as many of the same financial ratios as possible. This choice implies that I can compare my results for Canadian firms with the results reported in these contributions, particularly for the U.S. firms discussed in Arena (2010).

The focus of this paper is on Canadian firms and the bond markets in which the firms borrow funds. The following section provides some background information about the private placement market in Canada and the evidence of prior studies on Canadian private issuers.

Canada

To my knowledge, there have been two studies that examine the Canadian markets with a focus on privately and publicly issued stocks. Maynes and Pandes (2008) study the impact of resale restrictions and associated illiquidity on private placements and their evidence show the importance of liquidity for private placements in Canada. Carpentier and Suret (2009) investigate if private placement stocks provide investors with a fair rate of return. These authors provide some history of Canadian registration exemptions related to issuing securities in private placements in most provinces. More specifically, on September 14, 2005, a new regulation came into effect. Carpentier and Suret (2009, p.4) explains that "firms can use the accredited investor exemption to raise any amount, at any time, from any person or company that qualifies as an accredited investor." This rule explains the popularity of private placements in Canada during this paper's sample period from 2006 to 2015.

In terms of financial characteristics, Carpentier and Suret (2009, p.19) illustrate that "these issuers exhibit poor operating performance at the [time of] placement. At the end of the fiscal year preceding the placement, 67.46% of Canadian private placement issuers report negative operating income. Private placements appear to be a very important source of equity for these small and medium-sized businesses, and the number of private offerings largely surpasses the number of public seasoned equity offerings."

Most previous studies on the choice between private and public debt use a logistic regression model and/or an OLS regression model (e.g., Gomes and Phillips, 2012; Arena, 2010;

Denis and Mihov, 2003) except Kwan and Carleton (2004) and Blackwell and Kidwell (1988), who use both the probit regression and the OLS regression. Between a logistic model and a probit model, previous studies do not prefer one model over the other. I select both the probit regression and the OLS regression for this paper based on personal preference to study the relationship between the type of bond placement and firms' characteristics.

3. Data and Methodology

3.1 Sample Data

The private and public bond issuance data on the dependent variable used for analysis were obtained from the Bank of Canada (the Bank). Data were collected by the Bank using various data sources such as news sources, Bloomberg and Financial Post. The Bank maintains a security database which contains each bond issuance issued by Canadian firms based on a set of criteria as reported in Appendix A.[4]

This paper uses annual data from a sample period of 2006 – 2015. To my knowledge, this is the first paper to study the firms' bond placement choice using data from a sample period that covers the recent global financial crisis of 2007–2008 and the oil crisis that started in 2014.[5]

This paper examines the choice between public and private debt for corporations in Canada's mining, quarrying, and oil and gas extraction sector, as defined by the North American Industrial Classification System Canada (NAICS). This sector comprises oil and gas extraction, mining and quarrying (except oil and gas) and support activities for mining, and oil and gas

[4] Canadian firms are defined as entities with headquarters domiciled in Canada by the Bank.
[5] Among the studies I researched, Gomes et al. (2012) is the most recent study that examines the choice between private and public securities. Their paper studies a sample period of 1995 - 2003.

extraction. I choose this sector for two reasons. First, this sector had the largest fraction of bonds outstanding among all of the non-financial business sectors (28% of the total bonds outstanding as of December 2015), indicating that firms in this sector are major borrowers in the Canadian bonds markets. Second, the choice of focusing on firms in one sector also follows Blackwell and Kidwell (1988, p.258), who suggesting "a more homogeneous sample by restricting the analysis to one industry."

Over the sample period, a total of 148 distinct issuers in the mining, quarrying and oil and gas sector, with a total of 406 new bond issuances, were recorded by the Bank of Canada.[6] These bond issuances recorded are corporate debt securities which have an original term to maturity of one year or more and a minimum issuance of five million dollars.[7] Bonds include most types of bonds such as convertible bonds, debentures and term notes. Appendix A contains a detailed list of bond types that are included in the paper as well as those which are excluded from the paper. Data used for analysis includes bond issuances that are new, renewed, extended or increased.

Table 1 shows the frequency distribution of the offerings and firms by year. The number of new bond issuances and the number of issuers varied considerably over the sample period. The difference between the number of issuances and the number of issuers each year shows that some firms made multiple bond issuances during the same period. Of the 148 firms represented in the sample, 72 firms sold more than one bond issuance during the sample period. Some of them made multiple issuances within the same year, while others made multiple issuances across the sample period.

[6] A list of firms that are included in the data set can be retrieved from the Bank of Canada's security database by searching bond issuances issued by firms in the mining, quarrying, and oil and gas extraction sector between 2006 and 2015.

[7] The Bank imposes a set of restrictions, as reported in Appendix A when collecting corporate debt securities. The set of restrictions are imposed to ensure that current data are consistent with historical data.

[Table 1 to be inserted close to here]

Table 2 reports information about the bonds issued in private placements for each year in the sample period. Private bonds accounted for an average of 25% of the total issuance amount and an average of 55% of the total number of new bond issuances from 2006 to 2015, while public bonds accounted for the remaining 75% of the total issuance amount and 45% of the total number of new bonds issuances.

[Table 2 to be inserted close to here]

For the purpose of this study, I aggregate the principal amount of bond issuances of the same placement type by the same firm within the same year as in Arena (2010). This resulted in a total of 258 bond issuances issued by 148 firms. This sample consists of 126 private and 132 public placements. The firms that issued bonds during the sample period under analysis can be divided into three groups. The first group contains issuers that only issue bonds in private placements (group 1). The second group contains issuers that only issue bonds in public placements (group 2), and the last group contains issuers that issue bonds both publicly and privately (group 3).[8] Group 1 contains 59 firms and group 2 contains 65 firms. As in Kwan and Carleton (2004), the group 1 and group 2 issuers are called "non-switchers". Group 3 contains 24 firms. These firms that issued bonds both privately and publicly over the sample period are called "switchers". During the sample period, some of them issued bonds in both placements in the same year, while others issued bonds in both placements in different years. This initial

[8] In this paper, the term "group 1", "non-switchers that only issue bonds in private placements", and "private issuers" are interchangeable. Similarly, public issuers in this paper are the same as group 2 issuers; the switchers are the same as group 3 issuers or the issuers that issue bonds in both placements.

sample that consists of cross-sectional data is used in Models 1, 2, and 3, where I assume independence of cross-sections across years, even though some firms appeared in multiple years. I will discuss these models in details in Appendix C.

The main model of this paper is Model 4. For Model 4, the "small" firms are removed from the sample, as in Dhaliwal et al. (2004), Krishnaswami et al. (1999), and Yaman (2005). Because this model studies why firms with access to both private and public markets choose to issue private bonds, I exclude from the sample small firms that may not have access to public markets. I consider only firms that issued private bonds with asset size exceeding $50 million,[9] and firms that issued public bonds, as well as firms that issued bonds in both placements. In other words, the sample consists of group 2 and group 3 issuers and a subset of group 1 issuers who have at least $50 million of assets. Finally, I also delete firms with missing observations for independent variables. The final sample, therefore, consists of 119 firms and a total of 217 bond issues, which represents 217 firm-year observations (unbalanced panel data), that are used in Model 4.

3.2 Methodology

Model 4 uses data from a sample that consists of 119 firms and a total of 217 bond issues, which represents 217 firm-year observations (unbalanced panel data). This model studies why

[9] Dhaliwal et al. (2004) and Krishnaswami et al. (1999) consider only firms with firm size exceeding $100 million. They measure firm size using the book value of long term debt and capitalized lease obligations plus the market value of preferred and common stock. This paper uses asset size to measure firm size as in Yaman (2005) and Denis and Mihov (2003). As explained by Krishnaswami et al. (1999), the cut-off of $100 million is arbitrary. This cut-off number may not exclude all firms that do not have access to the public market. In my sample, the group 2 and 3 issuers are assumed to have access to public markets because they issue bonds in public placements. However, in the sample, there are 6 firms that belong to the group 2 and group 3 issuers are in the asset size range of $9 million to $67 million. Leung et al. (2008) show that Canadian small and medium sized enterprises (SMEs) that are measured by number of employees are smaller than the U.S. SMEs. Thus, I reduce the cut-off of $100 million to $50 million. As a result, 7 group one firms that issued 8 private bonds were removed from the initial sample.

firms with access to both private and public markets choose to issue private bonds by examining the probability of issuing private placement bonds relative to issuing public placement bonds over the sample period. This model does not use the previously defined 3 groups of issuers. Instead, Model 4 uses a sample that consists of group 2 and group 3 issuers and a subset of group 1 issuers who have at least $50 million of assets. Model 4 contains a type of bond placement that is either private (1) or public (0) as the dependent variable (a binary variable). An issuer that issues both public and private placements over the sample period (which we previously defined a "switcher") may choose to issue bonds only in private placements in one year and issue bonds in both placements in another year. In the event that a switcher only issues bonds in private placements in a given year, the dependent variable for that year will have the indicator (1). On the other hand, if the same switcher issues bonds both privately and publicly in the same year, I include both bond issuances as two different observations, with 1 and 0 as the dependent variables, and with the same value of the independent variables.

Models 4 was estimated in the form of a standard probit regression model and an OLS regression model (linear probability model) with robust standard errors. While the probit model gives more appropriate estimates of the probability of choosing one type of placement versus using both in a given year, the linear probability model provides coefficients that are much easier to interpret**.**

3.3 Characteristics of Canadian firms in the mining, quarrying and oil and gas extraction sector

The independent variables of this analysis are firms' characteristics, which are measured using a series of financial ratios as proxies. The financial ratios are constructed mainly using

individual firm's financial statements from the Bloomberg database, an online database containing financial data for many firms from around the world. For all firms in the sample, some of the independent variables used for analysis were extracted from annual financial statements.[10] Table 3 shows variable definitions and sources.

[Table 3 to be inserted close to here]

In general, financial ratios describe different aspects of a firm including its profitability, operating performance, liquidity and debt.[11] They are also used as proxies to measure flotation costs, the degree of information asymmetry, agency costs, and credit risks, as explained in the Literature review. A brief description of the financial ratios (see Table 3) used in this analysis is presented below.

Flotation Costs

The size of the issue is measured by the natural log of the issuance amount (LOGAMT) as in Kwan and Carleton (2004). The issuance amount is the principal amount of a bond issuance and it is calculated by aggregating the principal amount of bond issuances of the same placement type by the same firm within the same year following Arena (2010). Again, as explained in the Literature review and similarly to Arena (2010) and Blackwell and Kidwell (1988), issue size is interpreted as a proxy for flotation costs.

Information Asymmetry

The natural log of the book value of total assets (LOGASSETS) is used as a proxy for

[10] I collected the data from the Bloomberg database during the month of September, 2016. The Bloomberg database is constantly updated. Any revision after the data collection period to financial data of sampled firms for the period studied in this paper may not be reflected in the data used here.

[11] Investopedia (No date) "Financial Ratio Tutorial by Richard Loth." http://www.investopedia.com/university/-ratios/#. Accessed January 5, 2017.

overall size of a firm as in Yu et al. (2008) (Bloomberg series name: bs_tot_asset). Typically, the bigger the size, the larger the use of debt. For the reasons explained in the Literature review, and similarly to Denis and Mihov (2003), firm size is interpreted as a proxy for information asymmetry.

The firm's age (AGE) is the number of years from the first trading date to the bond issue date as in Krishnaswami et al. (1999). These authors use firm age to capture potential information asymmetry and expect that younger firms to have a greater degree of information asymmetry.

Similar to Arena (2010), this study also uses the fixed asset ratio (FIXED_ASSET) to measure stability. The ratio equals gross property plant equipment (PPE) divided by total assets (Bloomberg series name: ardr_property_plant_equip_gross/bs_tot_asset). Some literature (e.g., Yu et al. 2008) that examines the debt choice between bank loans and bonds uses the fixed asset ratio as a proxy for asset collateral value. It is expected that the fixed asset ratio is positively correlated with bond issuances regardless of whether the ratio is used as a proxy to measure a firm's stability or its asset collateral value. Denis and Mihov (2003) use the fixed asset ratio as another proxy to measure information asymmetry.

Agency Costs

Capital expenditures ratio (CAPEXP) is constructed by dividing capital expenditures by total assets as in Arena (2010) (Bloomberg series name: ard_capital_expenditures/bs_tot_asset) and this ratio is used as a proxy for measuring a firm's growth opportunity. As explained in the Literature review, growth opportunity is interpreted as a proxy for agency costs as in Krishnaswami et al. (1999) and Kwan and Carleton (2004).

The sales growth rate for each year (SALEGR) is used as another measure of the firm's growth opportunity, similarly to Yu et al. (2008) (Bloomberg series name: sales_growth). I assume that a high rate of growth this year will lead to high growth in the future as well.

Credit Risks

Return on assets (ROA) is calculated by dividing net income before extraordinary items by total assets as in Arena (2010) (Bloomberg series name: return_on_asset). It is used as a proxy for profitability of a firm. In general, return on assets could provide some insight into the efficiency of firm's management use of its assets to generate earrings. Profitability captures some aspects of credit risk, as suggested by Demerjian (2007).

The coverage ratio (INT_COV) is also used as a proxy for profitability. It is constructed by dividing earnings before interest and taxes (EBIT) by interest expenses as in Arena (2010) (Bloomberg series name: interest_coverage_ratio). This ratio measures the ability to meet financial obligations; in other words, the ability to pay interest expenses on outstanding debt. "The lower the ratio, the more the company is burdened by debt expense. When a company's interest coverage ratio is only 1.5 or lower, its ability to meet interest expenses may be questionable."[12]

Firms' net income can be used to measure earnings volatility. The analysis in this paper employs the measurement of earnings volatility method used in the study by Yu et al. (2008) by using a three-year moving average standard deviation of net income to compute the variable NISD (Net Income Standard Deviation) (Bloomberg series name: cf_net_inc). Earnings volatility is part of a firm's operating characteristics that also captures some aspects of credit risks. As explained by Yu et al. (2008), earnings volatility is a business risk. As earnings volatility

[12] Investopedia (No date) "Debt Ratios: Interest Coverage Ratio." http://www.investopedia.com/university/ratios/-debt/ratio5.asp. Accessed January 5, 2017.

increases, it is expected that firms will decrease the use of debt. However, these authors' empirical analysis does not find support for this argument.

Leverage (LEVERAGE) is calculated as total debt divided by total assets (Bloomberg series name: tot_debt_to_tot_asset). The leverage ratio is used as a proxy for firm liquidation risk as in Yu et al. (2008).

Similar to Arena (2010), credit rating (RATING) is used as a proxy for credit quality. Credit rating in this study is only based on the most recent credit rating for an issuer in Bloomberg. According to Moody's (one of the credit rating agencies), credit ratings change over time to reflect changes in the economic and business conditions. Moody's explains that "while because of their very nature, changes are to be expected more frequently among bonds of lower ratings than among bonds of higher ratings."[13] However, I was not able to obtain the historical credit rating for each issuer thus this paper cannot show how credit rating has changed from time to time for an issuer. Therefore, I used the same credit rating and applied it to the same issuer every year; thus, the assumption is that the issuer has the same credit rating during the sample period. Because of the same data issue, this paper does not include the credit rating for each bond issuance as in Arena (2010). Kwan and Carleton (2004, p.12) explain that "in general, private placement bonds are not rated by bond rating agencies…financial information…is generally unavailable so that it is not feasible to estimate their bond ratings using statistical models." Overall, 30% of issuers in the sample have ratings. Table 4 shows that among the issuers with credit ratings, 28% of public issuers have credit ratings in the A category (which includes ratings from AAA to A-), whereas private issuers only have 6% in the same A category. The remaining

[13] Moody's (No date) "Ratings Definitions." https://www.moodys.com/Pages/amr002002.aspx. Accessed January 5, 2017.

public bond issuers have credit ratings in the B category, which includes ratings from BBB+ to B-. On the other hand, 76% of private issuers have credit ratings in the B category and 18% have credit ratings in the C category (which includes ratings from CCC+ to D). This is consistent with previous studies (e.g., Arena, 2010) where public issuers tend to have higher credit quality.

[Table 4 to be inserted close to here]

Following Arena (2010), I converted ratings into numbers following the same numeric transformation as reported in Appendix B. Credit rating agencies such as Moody's and Standard & Poor's (S&P) have different presentations for their credit ratings. Bloomberg has ratings from both agencies. In the event that a firm only has Moody's credit ratings, I converted Moody's credit ratings using S&P's rating format then converted S&P's ratings to numbers. This variable is used in Models 1-3 in Appendix C.

Liquidity

The working capital ratio (WC) is used to evaluate a firm's liquidity. It is calculated by subtracting current liabilities from current assets (Bloomberg series name: working_capital). It reveals "whether a company has enough short term assets to cover its short term debt… If a company's current assets do not exceed its current liabilities, then it may run into trouble paying back creditors in the short term. The worst-case scenario is bankruptcy."[14]

The working capital ratio in this paper is the only variable that is not used in previous studies. Previous studies such as Maynes and Pandes (2008) use resale restrictions to measure illiquidity. These authors study the impact of resale restrictions and associated illiquidity on

[14] Investopedia (No date) "Working Capital." http://www.investopedia.com/terms/w/workingcapital.asp. Accessed January 5, 2017.

private placements and their evidence show the importance of liquidity for private placements in Canada. I select the working capital ratio as a proxy for liquidity because the working capital ratio is available in the Bloomberg database for every issuer in the sample.

Overall, there are no previous studies that use the same set of financial ratios that are employed in this paper. I selected a group of financial ratios among those that have been proposed in the literature based on the availability and the quality of data. There are many ratios that can be used to measure different aspects of firms' characteristics. For example, I used capital expenditures ratio (e.g., Arena, 2010) and sales growth rate (Yu et al. 2008) as proxies for growth opportunities while Arena (2010) uses the Q ratio and capital expenditures representing growth opportunities. The Q ratio in Arena (2010, p.11) is "the ratio of the market value of equity minus the book value of equity plus the book value of assets." I did not choose to use Q ratio because the book value of equity and assets are not available. Although there are many other financial ratios that can also be used, I believe that the financial ratios that are selected for this paper are relevant to measure aspects of firms' characteristics that also capture the importance of flotation costs, information asymmetry, agency costs, and credit risks. In addition, I use the natural logs of assets and issuance amount only to remain consistent with the methodologies used in some of previous studies such as Yu et al. (2008) and Kwan and Carleton (2004).

Expected findings

According to Carey et al. (1993), firm size and the size of the offering are important factors that explain the borrowing choice between private and public markets. They compare the switchers to the group 1 issuers who only issue bonds privately and show that the average group 1 firms are significantly smaller than switcher firms. Comparing the firms that issue stocks

privately, Carpentier and Suret (2009, p.1) find that "most of the private placements are offered by small and unprofitable entrepreneurial ventures." This suggests that firms that raise funds in private markets might have similar characteristics regardless of whether they issue bonds or stocks.

For firms that only issue bonds privately (group 1), some of them may not have the means to issue bonds publicly. Certain firms may not meet the regulatory requirements to issue public offerings. Some of them may be very young and have not built sufficient credibility in the public market and thus may face difficulties raising funds publicly. As explained by Arena (2010, p.17), "firms that issue traditional private debt might choose not to issue debt publicly both because of credit quality and information asymmetry considerations and the barrier constituted by flotation costs." Based on previous studies in this area (e.g., Carpentier and Suret, 2009; Carey et al. 1993), private issuers are expected to be smaller, younger, and possibly less profitable and less stable than firms that issue bonds publicly.

However, the interesting question is why some firms, namely switchers, would switch between public placement and private placement. Kwan and Carleton (2004) suggest that firms self-select different placement types for the purpose of minimizing overall costs which include financing costs and transaction costs. This means that firms will first define their borrowing needs, such as the amount that needs to be borrowed, and types of borrowing instruments such as bank loans, bonds or stocks. Then they choose the markets in private or public. Blackwell and Kidwell (1988) suggest that firms select the market that provides the lowest transaction costs. In addition to the costs factor, Kwan and Carleton (2004) argue that switchers are "fundamentally different" from non-switchers. For example, they find that switchers are larger and have higher credit ratings. Furthermore, Kwan and Carleton (2004, p.3) claim that "for switchers, the choice

between issuing private placements and public issues is related to the bond issue size and the borrowing firm's financial leverage." This is because their results suggest that "switchers choose to issue bonds privately when the issue size is small, and when the financial leverage, and hence the agency costs of debt, is high" (Kwan and Carleton, 2004, p.25).

For firms that only issue bonds publicly (group 2), the question is why they would not consider borrowing from the private market. Previous studies show that the answer also lies with the costs. Dhaliwal et al. (2004, p.18) find that "firms with profitable prospects may find it less costly to borrow from public debt markets." This is because certain transactions costs are fixed regardless of the amount of the offering, such as fixed flotation costs. From an economies of scale perspective, it is more cost effective to issue larger amounts in the public market. This could explain why on average firms tend to issue larger amounts in the public market. Additionally, it is also possible that group 2 issuers may not be aware of the potential cost savings in issuing bonds in the private market; thus, they may not have considered issuing bonds privately as an option.

Potential endogeneity issue

It is possible that some of the results of this paper could be affected by endogeneity, particularly in the form of reverse causality between the dependent variables and the independent variables. Actually, the literature in this area does not seem to be too concerned about this issue. The possible presence of endogeneity was not discussed in any of the studies that address questions similar to the one studied in this paper, and that I have used as references. Regarding the specific Models used in this paper, I don't think that the analysis performed in Model 4 is likely to be affected by problems of reverse causality. Firms generally define the amount they need to raise and the method of raising it (such as bonds or stocks) first, before they consider the

structure of the bonds such as size, currency, interest rate, and maturity. Then, they will need to structure their bonds issuances based on their target investors.[15] To define the target investors, firms will need to decide which markets to borrow from. When it comes to the markets, firms will use the key factors that were previously discussed to make their choice. Since the decision of the market from which to borrow is a second step in the financing decision, then Models 4 and 5 should not be affected by reverse causality issues. In other words, while the amount of bonds issued in a given year might have some impact on the measures used as explanatory variables in the probit and OLS models, the choice of the market in which the bonds will be placed should not affect these variables in any important way.

4. Results

Summary Statistics of the financial ratios for each issuer group

Table 5 reports the sample means and standard deviations of the financial ratios for each issuer group over the sample period. Public issuers (group 2) have a larger average issuance amount ($483.3 million), as well as a larger average size in terms of assets ($7.6 million) than private issuers (group 1). However, the results may be impacted by some large standard deviations as shown in Table 5. Additionally, the mean age of the public issuers is 9.5 while the mean age of the private issuers is 7.4. This is as expected because Arena (2010, p.14) shows that "the sample firms that issue public bonds are on average larger and older than firms that issue private debt." Switchers (group 3) have much larger assets size compared to the group 1 and 2 issuers (non-switchers) even through switchers' amounts of bonds issued are not as large as

[15] Treasurytoday (Sep 2003) "Bond issuance – the key questions." http://treasurytoday.com/2003/09/bond-issuance-the-key- questions. Accessed January 5, 2017.

public issuers'. This is not consistent with Blackwell and Kidwell (1988) who document that switchers are likely to sell larger issuances than non-switchers.

Table 5 also shows that group 2 firms also have a higher average credit rating than group 1 and group 3 firms, which is consistent with Arena's (2010) claim that firms with high credit quality prefers public bond issuances. As discussed (in the Section 3.3), the capital expenditures ratio (CAPEXP) and the sales growth rate (SALEGR) can both be interpreted as measures of growth opportunities. Table 5 shows that private issuers have a smaller capital expenditures ratio and a lower sales growth rate than public issuers. This indicates that private issuers have less growth opportunities than public issuers. Private issuers also have a larger leverage ratio (LEVERAGE) indicating that they have a relatively larger proportion of debt compared to their assets. This is consistent with the finding of Yu et al. (2008) as previously mentioned in the Literature review. Profitability is measured by the return to assets ratio (ROA) and the interest coverage ratio (INV_COV). Table 5 shows that private issuers are less profitable than public issuers, as expected as a consequence of the fact that on average these firms are smaller, younger, and more leveraged.

[Table 5 to be inserted close to here]

Model 4: bonds issued in private placements relative to bonds issued in public placements.

The main focus of this paper is to understand bond placement choices. I employ Model 4 to study how firms' characteristics explain why firms with access to both private and public markets choose to issue private bonds. As discussed (in the Section 3.2), Model 4 uses a sample that consists of group 2 and group 3 issuers and a subset of group 1 issuers who have at least $50 million of assets. Credit rating is not included in this model because, as discussed in the first part of the paper, annual values of this variable were not available. Model 4 contains a type of bond

placement that is either private (1) or public (0) as the dependent variable (a binary variable). In the following sections, the regression specifications and results are detailed.

Regression specifications

Model 4 is estimated in the form of a standard probit regression model and an OLS regression model (linear probability model). I first establish a baseline exercise in which I run the OLS regression and probit regression, with no fixed effects. This is to ensure that the independent variables are the same in both regressions. I repeat this exercise for the specification with contemporaneous values and lagged values. Then, I use the OLS regression with the alternative regression specifications. Previous studies such as Krishnaswami et al. (1999) and Gomes and Phillips (2012) include fixed effects such as industry fixed effects. I estimate several OLS regressions, in which I include just the firm fixed effects, just the year fixed effects, and both the firm and year fixed effects.[16] I also repeat this exercise for the specification with contemporaneous values and lagged values. I report the results of the baseline exercise in Table 6 and the results of the alternative regressions in Table 7.

Overall, the main focus of this model is to understand which variables, if any, are relevant for firms' choice of issuing bonds privately relative to issuing bonds publicly, given that firms have access to both private and public markets. For this purpose, I will analyze the results from the probit and the OLS models jointly and I will discuss their robustness to alternative specifications together in the following Results section.

Results

Table 6 presents coefficient estimates from the OLS and the probit regressions for Model

[16] I test the firm fixed effects, the year fixed effects, and both the firm and year fixed effects and confirm that the fixed effects are statistically significant.

4.[17] The F statistics test for Regression 1.1(with contemporaneous values) is 16.99 and it is statistically significant at the 1% level. The Wald chi–squared for Regression 1.2 is 36.90 and it is also statistically significant at the 1% level. However, the R-squared and the Pseudo R-squared are 0.09 and 0.08, respectively, indicating that the overall goodness of fit of these models is poor. Regressions 1.3 and 1.4 are the OLS and probit regressions for the specification with lagged values. Previous studies (e.g., Arena, 2010; Blackwell and Kidwell, 1988; Dhaliwal et al. 2004) test the models with lagged values to examine firms' financing choices with variables measured just prior to the borrowing decision. Although this seems to be the specification that is preferred in the literature, the relationships between variables might be weaker because of the lag. Table 6 shows that the overall explanatory power and goodness of fit of these models are poor.

Table 7 report the results across the alternative regression specifications. The R-squares for the estimated models range between 0.01 to 0.08, indicating that the overall goodness of fit of the models is poor. However, The F statistics tests show that all three models for the specification with contemporaneous values are statistically significant at the 1% level. Similar to the results in Table 6, Table 7 also shows that the overall explanatory power and goodness of fit of the models with lagged values are poor. Overall, unfortunately, most of the estimated coefficients reported in Table 6 and Table 7 are statistically insignificant. It is possible that the variables considered in this study are not relevant to the borrowing choices of firms in this sector. However, there are a few ones that are statistically significant may have an impact on the bond placement choices.

[17] For the probit models, the reported values are not the marginal effects. This is done only to remain consistent with the methodologies used in previous studies such as Kwan and Carleton (2004).

Flotation Costs

Issue size, measured by LOGAMT is positively correlated with the choice of issuing bonds privately relative to issuing bonds publicly in Regressions 1.1, 1.2, and 2.2. The coefficient is statistically significant at the 1% level in all three models, suggesting that issue size might have an impact on the choice of issuing private bonds even after controlling for the year effects. The coefficient is also statistically significant at the 10% level in Regression 2.6 (with lagged values). As previously explained, the overall explanatory power and goodness of fit of this model with lagged values are poor and most of the parameters are statistically insignificant. Therefore, I focus on discussing the results from the regressions for the specifications with contemporaneous values only. Overall, the results are surprising because Blackwell and Kidwell (1988) and Yaman (2005) suggest that firms that sell large issues are more likely to choose to borrow from public markets in order to avoid the high fixed flotation costs of public placements. This paper seems to suggest that flotations costs might not play a role in the bond placement choices.

Agency Costs

The sales growth rate (SALEGR) is negatively correlated with the choice of issuing bonds privately relative to issuing bonds publicly in Regressions 1.1 and 2.1. The coefficient is statistically significant at the 10% and 5% level, respectively. In addition, the effect is also statistically significant in some models for the specification with lagged values (e.g., Regressions 1.3, 1.4 and 2.5). However, the signs of the coefficient in these models are opposite than the signs of the coefficient in the models with contemporaneous values. Again, since the overall explanatory power and goodness of fit of these models with lagged values are poor, I focus on discussing the results from the regressions for the specifications with contemporaneous values

only.

The sales growth rate is used as a proxy for a firm's growth opportunity. As explained in the Section 2, Krishnaswami et al. (1995) show that firms with more growth opportunities are more likely to issue private debt to reduce agency costs. The results in this paper do not support this argument even after holding firm factor fixed. This paper seems to suggest that agency costs might not play a role in the bond placement choices.

Credit Risks

The leverage ratio, which as previously mentioned can be interpreted as a measure of the liquidation risk of the firm, also has a positive correlation with the choice of issuing bonds privately relative to issuing bonds publicly in Regressions 1.1, 1.2 and 2.2. The effect is statistically significant at the 10% level in all three models, suggesting that leverage might have an impact on the choice of issuing private bonds. This finding is as expected because Yu et al. (2008) find a negative relation between firms that issue public debt and their level of leverage. Higher leverage implies higher credit risks or lower credit quality. Denis and Mihov (2003) show that private debt accommodates the borrowing needs of low credit quality firms.

The variable NISD (Net Income Standard Deviation) is used as a proxy for earnings volatility. The relationship between earnings volatility and the dependent variable is positive. The coefficient is statistically significant at the 5% level in both Regressions 2.1 and 2.3, suggesting that holding firm or firm and year factors fixed, earnings volatility increases the use of private bonds. As previously explained, earnings volatility captures some aspects of credit risks. The results are consistent with previous studies (e.g., Denis and Mihov, 2003) where firms with high credit risks or low credit quality are more likely to issue private bonds.

Liquidity

The working capital ratio (WC) which as previously mentioned is used to evaluate a firm's liquidity, has a positive correlation with the choice of issuing bonds privately relative to issuing bonds publicly in Regressions 1.1, 1.2 and 2.2. The effect is statistically significant at the 10%, 1%, and 10% level, respectively, suggesting that liquidity might have an impact on the choice of issuing private bonds even after controlling for the year effects. This finding is as expected because Maynes and Pandes (2008) who use resale restrictions to measure illiquidity show the importance of liquidity for private placements of equity in Canada.[18]

[Table 6 and Table 7 to be inserted close to here]

In addition, I test for correlations using a Spearman's correlation as in Dhaliwal et al. (2004) and find that no evidence of linear relationship between pairs of independent variables is noteworthy. All of the correlations between pairs of independent variables are less than 0.5 except the pair of issue size (LOGAMT) and firm size (LOGASSETS), which shows a positive correlation of 0.69. Larger firms tend to borrow more money by issuing larger amount of issuances. This correlation is not surprising. Dhaliwal et al. (2004) also observe the same correlation between these two variables in their study. Furthermore, I find no evidence of multicollinearity.[19]

[18] Maynes and Pandes (2008) focus on private placements of equity in Canada, instead of private bonds. I find limited studies that compare bond issuers' characteristics with stock issuers' in Canada. Here I am assuming that the finding of the importance of liquidity for private equity in Canada supports my finding of the importance of liquidity for private bonds.

[19] All of the Variance Inflation Factors (VIFs) (common indicators of collinearity) are smaller than 2.5, with an average value of 1.43. I use condition indexes to examine the multicollinearity and show that the condition number of the matrix is 21.48 and no evidence of multicollinearity found in the variance-decomposition proportions.

Overall, I do not find that flotation costs, or agency costs affect the bond placement choices. I do find, however, that credit risks, captured by leverage and earnings volatility, as well as liquidity may affect the choice of issuing bonds privately relative to issuing bonds publicly. These results suggest that firms with high credit risks and high liquidity are more likely to issue bonds privately. However, the results of all regressions (with no fixed effects and with fixed effects) are not similar, suggesting that models without fixed effects might be affected by omitted variable bias. Additionally, it is worth mentioning that most firms' characteristics in this paper are not explaining the bond placement choices, suggesting that work remains to be done on investigating the underlying determinants of the choice between private and public placements of bonds in Canada. For instance, Dhaliwal et al. (2004) conclude that firms with high public disclosure of firm-specific information cost is more likely to issue private debt. Furthermore, the sample size in this paper is very small compared to the sample sizes of previous studies.[20] The small sample size could also contribute to the fact that most firms' characteristics in this paper cannot explain the bond placement choices in Canada.

Robustness Analysis

In this section I discuss the robustness of the results to a few changes in the sample size used for the analysis.

As mentioned in the Section 3.1, Model 4 employs a sample that consists of 119 firms and a total of 217 bond issues. I examine the robustness of the results by altering the sample size and re-estimating Model 4 in two separate ways. First, following Dhaliwal et al. (2004), I deleted

[20] For instance, Krishnaswami et al. (1999) use a sample that consists of 1188 observations selected from 297 firms; Yu et al. (2008) have a sample that consists of 3453 observations selected from 579 firms; and Arena (2010) analyzes 9478 observations selected from 2170 firms.

observations when a firm issue bonds in both private placements and public placements in the same year and re-estimated all the regressions for the specification with contemporaneous values (Regressions 1.1, 1.2, 2.1, 2.2, and 2.3). Thus, 6 firms with 12 bond issues were removed from the sample. This allows me to examine more closely the bond placement choices between private and public markets. The analysis with a smaller sample size was giving very similar results that were previously discussed. This is consistent with Dhaliwal et al. (2004) who did not observe any systematic difference in the results between the model with a smaller sample size and their original model.

For the second robustness test, I increased the sample size used in Model 4. As previously explained, because the original Model 4 studied why firms with access to both private and public markets choose to issue private bonds, I excluded from the sample small firms that may not have access to public markets. For this test, I added all the firms back to the sample and re-estimated Regressions 1.1, 1.2, 2.1, 2.2, and 2.3 with a sample that consisted of 225 issues and 126 firms. The analysis with a bigger sample size was giving very similar results that were previously discussed. However, a new variable, LOGASSETS, became statistically significant from this test.

Firm size, measured by LOGASSETS is negatively correlated with the choice of issuing bonds privately relative to issuing bonds publicly in Regressions 1.2 and 2.2. The coefficient is statistically significant at the 10% level in both models, suggesting that firm size might have an impact on the choice of issuing private bonds even after controlling for the year effects. This finding is consistent with Denis and Mihov (2003), who use firm size as a proxy for information asymmetry show that firm size is positively related to the likelihood of issuing public debt. This

suggests that information asymmetry may play a role in the bond placement choices, only when the sample includes the small firms that have less than $50 million of assets.

5. Conclusion

This paper examines how Canadian mining, quarrying and oil and gas firms' characteristics explain their borrowing preference between privately and publicly offered bonds. In particular, the focus of this paper is to study why firms with access to both private and public markets issue bonds in private placements. Some characteristics are found to be related to a higher probability of issuing bonds in private placements. For example, credit risks, captured by leverage and earnings volatility, as well as liquidity may affect the choice of issuing bonds privately relative to issuing bonds publicly. These results suggest that firms with high credit risks and high liquidity are more likely to issue bonds privately.

In conclusion, this paper shows that most of the characteristics of the firms in the mining, quarrying and oil and gas sector are not explaining their borrowing preferences between privately and publicly offered bonds. It is possible that the variables considered in this study are not relevant to the borrowing choices of firms in this sector because there are other factors (such as disclosure requirements) that are more central to this decision. However, it is also possible that the small size of the sample used in the analysis is responsible for the lack of precision of the estimates. Thus, it is possible that clearer conclusions could be reached if a larger sample of data was available.

The analysis performed in this paper could be extended to include other factors, such as disclosure requirements, or Canadian firms' in sectors beyond the mining, quarrying and oil and gas sector. It is possible that firms in other sectors will have strong characteristics that can offer a

better understanding of the determinants of the choice between private and public placements of bonds.

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Appendix A: Types of bonds included and excluded for this paper

Bonds that are included in the paper:

- 5 million or greater
- notes= promissory / subordinate / secured / unsecured / institution / medium-term / mortgage bonds / equity index linked notes / senior lien /secured lien
- liquid yield option notes (LYONS)= convertible notes
- sinking funds
- bonds= convertible / junk / income / savings / term / index / perpetual/first mortgage / industrial revenue / pollution control serial / amortized / amortizing /re-openings
- debentures
- units (debenture units): debenture with an attached warrant
- capital debentures / capital securities = preferred securities
- subscription receipts (when converted into bonds)
- long-term debt of subsidiaries
- term-preferred shares
- deposit notes
- covered Bond
- puttable Bond
- serial Bond when breakdowns are available
- bonds issued by a Private company
- partnerships including sole-purpose partnerships
- domestic Medium Term Note

Bonds that are excluded from the paper:

- mortgage backed securities /purchase money mortgage
- Canada Mortgage Bonds
- asset backed securities (ABS): doesn't matter if the security is backed by a mortgage / credit card or a loan
- investment certificates (much like bank deposit products)
- pass-through certificate
- secondary offering
- revolving loans
- when the issuer is a flow-through limited partnership (FTLP)
- issued to the parent or subsidiary or to a company with the same parent *
- syndicated bank loans
- investment Funds / Investment Trusts
- loans, mortgage backed bonds, capital leases, lines of credit
- shelf registration or shelf prospectus – swaps
- bonds issued to the parent company from its subsidiary

Appendix B: Credit rating conversions

Conversion number	Ratings
22	AAA
21	AA+
20	AA
19	AA-
18	A+
17	A
16	A-
15	BBB+
14	BBB
13	BBB-
12	BB+
11	BB
10	BB-
9	B+
8	B
7	B-
6	CCC+
5	CCC
4	CCC-
3	CC
2	C
1	D

Appendix C: Models 1-3, a study on the different issuers

As previously mentioned, the firms that issued bonds during the sample period under analysis can be divided into three groups. The first group contains issuers that only issue bonds in private placements (group 1). The second group contains issuers that only issue bonds in public placements (group 2), and the last group contains issuers that issue bonds both publicly and privately (group 3). To better understand these groups of issuers, I examine three models (Models 1, 2, and 3), which are cross-sectional regressions. Each model focuses on only one group of issuers. The independent variables for each model are averages of financial ratios over the sample period from 2006 to 2015.

Models 1, 2, and 3 employ the natural log of the issuance amount (LOGAMT) as dependent variables. Each model focuses on only one group of issuers. Specifically, Model 1 focuses on group 1 issuers, Model 2 on group 2 issuers and Model 3 on group 3 issuers. All models were estimated using Ordinary Least Squares (OLS) regression with robust standard errors. The purpose of these three models is to understand which variables, if any, are important for bond issuances for a particular group of issuers. Although I am not exploiting the annual variations in the data when I compute the averages, the models preserve the cross-sectional variation in the data. This is similar to the analysis in Krishnaswami et al. (1999) who use cross-sectional regressions that use the time-series mean across the sample years for each variable. They also acknowledge that these regressions mask any time-series variation in the observations.

It is possible that the problem of reverse causality is more relevant for these models than for Model 4. These models use the amount of new bonds issued as the dependent variable, and the data for all variables are measured as averages for the entire sample period. Some of the measures that are used in the analysis (e.g., leverage ratio and the working capital ratio) are computed using the level of debt of the firm, which includes the dependent variable, the amount of new bonds issued, while some others might be affected by interest payments on this debt. Thus, it is possible that the amount of new bonds issued during the period under study had some impact on these variables, especially in later years. However, Models 1 to 3 are not the central point of this paper, and the results from these models should be taken as just indicative. The results of Models 1-3 are discussed in the following section.

Results

I start by estimating a model in which the dependent variable is the average of the annual issuance amount (expressed in logs) over the sample period, while the independent variables are the averages of the measures described in Table 3 over the sample period. This model is estimated separately for each class of issuers, and the resulting three models are denoted Model 1 (private placement firms), Model 2 (public placement firms), and Model 3 (switchers). As previously mentioned, the focus is to understand which variables, if any, are important for bond issuances for a particular group of issuers. The models are estimated by OLS, and the results are reported in Table 8.

The R-squares for Models 1 to 3 are 0.68, 0.69, and 0.65, respectively. F statistics tests show that all three models are statistically significant. However, it is important to note that the results for Models 1 to 3 are only indicative for three reasons. First, the sample size for the three models is not very large: there are 59 firms in Model 1, 65 firms in Model 2, and only 24 firms in Model 3. In addition, some of the variables used in the estimation are correlated with each

other.[21] Second, the data is averaged over the sample period, thus the results are only referring to average relationships over the time period. Third, these three models might be affected by endogeneity problems, which I previously discussed.

The results suggest that for all firms (those that issue bond only in private markets, those that issue bonds only in public markets, and those using both types of placements) firm size (LOGASSETS) and growth opportunities (CAPEXP) are positively correlated with the log of the issuance amount. The coefficients are statistically significant in all three models. As previously explained, the natural log of the book value of total assets (LOGASSETS) is used as a proxy for overall size of a firm while the capital expenditure ratio is used as a proxy for measuring a firm's growth opportunity as in Arena (2010). Comparing the magnitude of the coefficients in the three models, the size of the parameters for LOGASSETS and CAPEXP are larger for Model 3 than Model 1 and Model 2. This means that the variables LOGASSETS and CAPEXP have a stronger correlation with the dependent variable for switcher firms than for private and public firms. This result suggests that firm size and growth opportunities might play a role in the decision to issue both public and private bonds rather than focusing only on one of these markets.

As mentioned in the Section 3.3, the sales growth rate for each year (SALEGR) is used as another measure of the firm's growth opportunity, as in Yu et al. (2008). The relationship between SALEGR and the log of the issuance amount is negative (and statistically significant at the 1% level) only for private issuers, suggesting that growth opportunities have a negative impact on the log of the issuance amount. This result contradicts the above results. Hence, it is unclear how growth opportunities impact the dependent variable for private issuers.

The profitability of the firm is measured in this paper by the variables return on assets (ROA) and interest coverage ratio (INT_COV). The results reported in Table 8 show that the interest coverage ratio is positively correlated with the issuance amount and the coefficient is statistically significant at the 5% level only for the issuers on private markets. This result seems to suggest that profitability might play a stronger role in the decisions of firms that issue bonds on private markets only.

The results show a negative correlation between the leverage ratio (LEVERAGE) and the log of the issuance amount and the coefficient is statistically significant only for public issuers at the 5% level. This result is intuitive: a high leverage ratio indicates that a firm already has a high level of debt, thus this firm may not be able to borrow much more if needed, which might lead to a smaller amount of bond issuances.

Liquidity is measured by the working capital ratio (WC). This variable is negatively correlated with the issuance amount (and the coefficient is statistically significant at the 1% level) for private issuers, while the estimated parameter is not significant for the other two groups. These liquidity concerns might lead private issuers to borrow less. The other two groups of issuers might not face the same type of concerns, but it is also clear from Table 8 that for

[21] I test for correlations using a Spearman's correlation. While most of the correlations between pairs of independent variables are not correlated, the positive correlation between the return on assets (ROA) and the coverage ratio (INT_COV) is noteworthy. This pair is correlated in all three models with Spearman's correlations of 0.81, 0.86, and 0.67, respectively. In addition, I also use condition indexes to examine the multicollinearity but find no evidence of multicollinearity.

Model 2 and Model 3 the estimated parameters on the work capital ratio are much less precise, so the corresponding variable may not have any effect on the dependent variable.

Finally, credit rating is positively correlated with the issuance amount and statistically significant at the 5% level for private issuers and at the 1% level for public issuers. This means that the higher the credit rating is, the larger the amount a firm will be able to borrow, which is expected. All the other variables included in the right-hand side of Models 1 to 3 did not exhibit a clear relationship with the issuance amount.

[Table 8 to be inserted close to here]

According to the results discussed above, some firm characteristics, such as firm size and growth opportunities (measured by the capital expenditure ratio), exhibit a strong relationship with the bond issuance amount for all three groups of issuers. In other words, firm size and growth opportunities might have an impact on the amount of issuance for all groups of issuers. Krishnaswami et al. (1999) also use cross-sectional regressions that use the time-series mean across the sample years for each variable.[22] These authors show that firm size and growth opportunities have a negative impact on the proportion of a firm's privately placed debt.

Overall, as previously mentioned, Models 1 to 3 are not the main studies of this paper and the results are only indicative.

[22] Krishnaswami et al. (1999) use a sample that consists of 1188 observations selected from 297 firms. Their dependent variable is the ratio of privately placed long-term debt to total long-term debt.

Tables

Table 1 Summary of issuances and issuers over the sample period

This table presents the frequency distribution of the offerings and firms by year. The number of new bond issuances and the number of issuers varied considerably over the sample period. The difference between the number of issuances and the number of issuers each year shows that some firms made multiple bond issuances during the same period. Of the 148 firms represented in the sample, 72 firms sold more than one bond issuance during the sample period. Some of them made multiple issuances within the same year, while others made multiple issuances across the sample period.

Year	Amount of issuances (in thousands)	Highest issuance amount (in thousands)	Lowest issuance amount (in thousands)	Average of issuance amount (in thousands)	Number of new issuances	Number of issuers
2006	9634333	1153000	6500	158490.27	32	15
2007	19041704	1368625	7500	259879.51	48	16
2008	14007945	1270917	9500	237718.93	35	8
2009	23378129	1514467	5000	290276.22	44	11
2010	13763926	607680	730	147995.42	56	15
2011	20285106	967976	5000	211803.34	45	17
2012	28179718	911936	12750	227206.22	51	17
2013	19883053	1363999	10000	301544.63	44	17
2014	31611240	2473039	6796	472155.46	40	22
2015	5234056	750000	14800	357318.43	11	10

Table 2 Bonds issued in private placements over the sample period

Table 2 reports information about the bonds issued in private placements for each year in the sample period. Private bonds accounted for an average of 25% of the total issuance amount and an average of 55% of the total number of new bond issuances from 2006 to 2015, while public bonds accounted for the remaining 75% of the total issuance amount and 45% of the total number of new bonds issuances. Percentage of total issuance amount equals the issuance amount in private placements divided by the total issuance amount; percentage of total number of new issuances equals the number of new issuances in private placements divided by the total number of new issuances.

Year	Amount of issuances in private placement (in thousands)	Percentage of total issuance amount	Number of new issuances in private placement	Percentage of total number of new issuances
2006	1926446	20%	14	44%
2007	4097441.2	22%	22	46%
2008	2250403.2	16%	21	60%
2009	6970699.8	30%	29	66%
2010	3529322.1	26%	33	59%
2011	4123977.5	20%	20	44%
2012	5103963.4	18%	24	47%
2013	7097117.5	36%	29	66%
2014	6580088.5	21%	21	53%
2015	2130502.7	41%	7	64%

Table 3 Variable definitions and sources

This table provides description of the financial ratios used in this analysis.

Variable	Definition	Source	Measurement
LOGAMT	Log of amount of the bond issued (in millions of dollars)	Bank of Canada	Issue size
LOGASSETS	Log of total assets (in millions of dollars)	Bloomberg	Firm size
CAPEXP	Capital expenditures divided by total assets	Bloomberg	Growth opportunity
FIXED_ASSET	Fixed asset ratio: Gross Property_Plant_Equipment divided by total assets	Bloomberg	Stability
ROA	Net income before extraordinary items divided by total assets	Bloomberg	Profitability
LEVERAGE	Total debt divided by total assets	Bloomberg	Financial risks
NISD	Three-year Moving Average Standard Deviation of Net Income	Bloomberg	Earnings Volatility
SALEGR	Revenue growth year over year	Bloomberg	Growth Opportunity
WC	Working capital: Current Assets - Current Liabilities (in millions of dollars)	Bloomberg	Liquidity Measurement
INT_COV	The interest coverage variable EBIT/Interest expenses	Bloomberg	Profitability
AGE	number of years from the first trading date to the bond issue date	Bloomberg	Years of existence of a firm
RATING	Credit rating for an issuer	Bloomberg	Credit quality of a firm

Table 4 Credit ratings for non-switchers and switchers

This table shows that among the issuers with credit ratings, 28% of public issuers have credit ratings in the A category (which includes ratings from AAA to A-), whereas private issuers only have 6% in the same A category. The remaining public bond issuers have credit ratings in the B category, which includes ratings from BBB+ to B-. On the other hand, 76% of private issuers have credit ratings in the B category and 18% have credit ratings in the C category (which includes ratings from CCC+ to D).

		Non-Switchers		Switchers
	Ratings	Private	Public	Both
A Category	AAA AA+ AA AA- A+ A A-	6%	28%	10%
B Category	BBB+ BBB BBB- BB+ BB BB- B+ B B-	76%	72%	70%
C Category	CCC+ CCC CCC- CC C D	18%	0%	20%

Table 5 Summary statistics of firms' characteristics for each group of issuers

This table shows three groups of issuers and lists statistics on firm characteristics for each group. The first group contains issuers that only issue bonds in private placements (Private). The second group contains issuers that only issue bonds in public placements (Public), and the last group contains issuers that issue bonds both publicly and privately (Both). Group Private contains 59 firms, group Public contains 65 firms and group Both contains 24 firms. The first two groups of issuers are called "non-switchers", while the last group of issuers is called "switchers". This sample consists of 126 private and 132 public placements. AMT and ASSETS are in millions of dollars.

	Non-Switchers				**Switchers**	
	Private		Public		Both	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
AMT	247.33	242.42	483.32	846.94	377.60	293.70
ASSETS	5925.33	34943.40	7633.92	13730.88	10534.75	7265.38
CAPEXP	-0.17	0.16	-0.13	0.11	-0.10	0.08
FIXED_ASSET	0.96	0.94	0.85	0.63	0.57	0.50
ROA	-5.61	16.64	-0.37	13.42	4.18	4.50
LEVERAGE	28.46	16.92	23.43	16.15	24.47	15.22
NISD	782.18	3229.93	710.14	1409.94	311.87	206.88
SALEGR	44.07	226.90	145.52	861.10	70.95	91.31
WC	3243.42	28818.97	172.09	980.60	175.01	430.53
INT_COV	-6.15	43.67	3.16	25.25	2.91	3.04
AGE	7.40	7.49	9.47	9.46	12.71	9.32
RATING	2.83	4.65	6.19	7.21	3.29	5.26

Table 6 OLS and Probit estimates of Model 4

This table presents coefficient estimates from Model 4. Each regression of Model 4 employs a type of bond placement that is either private (1) or public (0) as the dependent variable. This sample consists of group 2 and group 3 issuers and a subset of group 1 issuers who have at least $50 million of assets. Regressions 1.1 and 1.2 are the OLS and probit regressions for the specification with contemporaneous values, with no fixed effects. Regressions 1.3 and 1.4 are the OLS and probit regressions for the specification with lagged values, with no fixed effects. All regressions were estimated with the "robust" option to correct the standard errors for heteroskedasticity (robust standard errors are in parentheses). I adjust variables SALEGR, NISD and WC for scaling by dividing the variables by 1000.

	Regression 1.1	Regression 1.2	Regression 1.3	Regression 1.4
Independent variable	Coefficient	Coefficient	Coefficient	Coefficient
LOGAMT	0.1933 [a]	0.7192 [a]	-0.0726	-0.2204
	(0.0531)	(0.2335)	(0.1519)	(0.3878)
LOGASSETS	-0.0522	-0.2758	0.0026	0.0244
	(0.0549)	(0.2073)	(0.1404)	(0.3567)
CAPEXP	-0.1017	-0.416	-0.1482	-0.3848
	(0.2793)	(0.8052)	(0.5692)	(1.3521)
FIXED_ASSET	-0.0269	-0.0832	-0.0852	-0.2022
	(0.0600)	(0.1558)	(0.1050)	(0.2610)
ROA	0.0003	0.0009	0.0040	0.0095
	(0.0029)	(0.0089)	(0.0097)	(0.0247)
LEVERAGE	0.0049 [c]	0.0128 [c]	0.0025	0.0052
	(0.0025)	(0.0071)	(0.0057)	(0.0148)
NISD	-0.0019	-0.0078	-0.0257	-0.0784
	(0.0203)	(0.0497)	(0.0369)	(0.0907)
SALEGR	-0.0442 [c]	-0.1761	1.0251 [b]	3.3590 [c]
	(0.0225)	(0.1383)	(0.4338)	(1.8632)
WC	0.0026 [c]	0.0115 [a]	-0.0041	-0.0130
	(0.0015)	(0.0044)	(0.0637)	(0.1635)
INT_COV	-0.0012	-0.0067	-0.0120	-0.0332
	(0.0008)	(0.0068)	(0.0091)	(0.0259)
AGE	-0.003	-0.0087	0.0031	0.0091
	(0.0036)	(0.0094)	(0.0055)	(0.0138)
N	217	217	98	98
F - Statistic	16.99 [a]		1.31	
R - squared	0.09		0.09	
Wald chi - squared		36.90 [a]		8.61
Pseudo R - squared		0.08		0.07

[a] Significant at the 1% level.
[b] Significant at the 5% level.
[c] Significant at the 10% level.

Table 7 OLS estimates of Model 4 with the alternative regression specifications

This table presents coefficient estimates from Model 4 using OLS with the alternative regression specifications. Each regression of Model 4 employs a type of bond placement that is either private (1) or public (0) as the dependent variable. This sample consists of group 2 and group 3 issuers and a subset of group 1 issuers who have at least $50 million of assets. Regressions 2.1, 2.2 and 2.3 are the OLS regressions for the specification with contemporaneous values, with just the firm fixed effects, just the year fixed effects, and both the firm and year fixed effects, respectively. Regressions 2.4, 2.5 and 2.6 are the OLS regressions for the specification with lagged values, with just the firm fixed effects, just the time fixed effects, and both fixed effects, respectively. All regressions were estimated with the "robust" option to correct the standard errors for heteroskedasticity (robust standard errors are in parentheses). I adjust variables SALEGR, NISD and WC for scaling by dividing the variables by 1000.

	Regression 2.1	Regression 2.2	Regression 2.3	Regression 2.4	Regression 2.5	Regression 2.6
Independent variable	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
LOGAMT	0.2849	0.2015 [a]	0.3667	-0.3143	-0.0593	-0.3634 [c]
	(0.2467)	(0.0541)	(0.2725)	(0.1896)	(0.1789)	(0.2092)
LOGASSETS	-0.0049	-0.0809	-0.0365	0.5130	-0.0072	0.6469
	(0.2981)	(0.0579)	(0.3095)	(0.4047)	(0.1589)	(0.4156)
CAPEXP	-0.4448	-0.1522	-0.6759	0.7782	0.1334	0.9192
	(0.5125)	(0.2684)	(0.5874)	(1.1332)	(0.6095)	(1.2178)
FIXED_ASSET	0.1259	-0.0674	0.2055	0.2065	-0.1241	0.3018
	(0.0872)	(0.0592)	(0.1291)	(0.1822)	(0.1076)	(0.2672)
ROA	-0.0060	0.0008	-0.0034	0.0101	0.0037	0.0071
	(0.0084)	(0.0027)	(0.0085)	(0.0091)	(0.0092)	(0.0092)
LEVERAGE	0.0087	0.0046 [c]	0.0079	0.0137	0.0038	0.0115
	(0.0064)	(0.0026)	(0.0064)	(0.0110)	(0.0057)	(0.0130)
NISD	0.0297 [b]	-0.0211	0.0282 [b]	-0.0008	-0.0326	0.0096
	(0.0139)	(0.0214)	(0.0129)	(0.0138)	(0.0347)	(0.0202)
SALEGR	-1.0304 [b]	-0.0432	-0.5154	0.1751	0.9561 [b]	-0.5540
	(0.4158)	(0.0281)	(0.4844)	(0.4299)	(0.4461)	(0.7360)
WC	0.0377	0.0028 [c]	0.0385	0.0330	0.0033	-0.0093
	(0.0328)	(0.0015)	(0.0372)	(0.0567)	(0.0845)	(0.0941)
INT_COV	-0.0068	-0.0008	-0.0050	-0.0060	-0.0110	-0.0128
	(0.0111)	(0.0009)	(0.0115)	(0.0130)	(0.0081)	(0.0170)
AGE	-0.0365	-0.0049	-0.0065	-0.0285	0.0010	-0.0018
	(0.0316)	(0.0037)	(0.0451)	(0.0518)	(0.0056)	(0.0561)
N	217	217	217	98	98	98
F - Statistic	3.80 [a]	4.68 [a]	2.24 [a]	0.64	1.26	0.49
R - squared	0.04	0.08	0.03	0.01	0.08	0.02

[a] Significant at the 1% level.
[b] Significant at the 5% level.
[c] Significant at the 10% level.

Table 8 OLS estimates of Models 1, 2, and 3

This table presents coefficient estimates from Models 1, 2, and 3. Each model employs the natural log of the issuance amount (LOGAMT) as dependent variables and focuses on only one group of issuers. Specifically, Model 1 focuses on group 1 issuers, Model 2 on group 2 issuers and Model 3 on group 3 issuers. This sample that consists of cross-sectional data is used in Models 1, 2, and 3, where I assume independence of cross-sections across years, even though some firms appeared in multiple years. All models were estimated using Ordinary Least Squares (OLS) regression with the "robust" option to correct the standard errors for heteroskedasticity (robust standard errors are in parentheses).

	Model 1	Model 2	Model 3
Independent variable	Coefficient	Coefficient	Coefficient
LOGASSETS	0.2378 [a]	0.1404 [b]	0.3057 [b]
	(-0.0858)	(-0.0623)	(0.1166)
CAPEXP	1.2368 [b]	1.4209 [b]	2.7034 [a]
	(-0.4626)	(-0.5329)	(0.7702)
FIXED_ASSET	-0.0461	-0.0927	0.1566
	(-0.0612)	-(0.1390)	(0.4441)
ROA	0.0095	-0.0039	0.0004
	(-0.0064)	-(0.0042)	(0.0118)
LEVERAGE	-0.0003	-0.008 [b]	0.0078
	(-0.0051)	-(0.0033)	(0.0079)
NISD	0.0000	-0.0001	0.0015
	(0.0000)	(0.0000)	(0.0010)
SALEGR	-0.0004 [a]	0.0000	0.0006
	(-0.0001)	(0.0000)	(0.0021)
WC	-0.0000 [a]	-0.0001	0.0004
	(0.0000)	(0.0001)	(0.0004)
INT_COV	0.0028 [b]	0.0005	0.0141
	-(0.0011)	(0.0023)	(0.0086)
AGE	-0.0050	-0.0036	0.014
	(0.0078)	(0.0077)	(0.0109)
RATING	0.0407 [b]	0.0687 [a]	0.0084
	(0.0165)	(0.0104)	(0.0428)
N	59	65	24
F - Statistic	37.57 [a]	16.55 [a]	14.28 [a]
R - squared	0.68	0.69	0.65

[a] Significant at the 1% level.
[b] Significant at the 5% level.
[c] Significant at the 10% level.