BANK OF CANADA
BANQUE DU CANADA

Working Paper/Document de travail
2013-36

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Bank of Canada Working Paper 2013-36

October 2013

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ISSN 1701-9397

Acknowledgements

We would like to thank participants at various conferences and seminars for comments and suggestions.

Abstract

A large body of empirical literature investigates differences in financing structures across firms. Private firms' financing receives little attention due to the lack of data. Using administrative confidential data on the universe of Canadian corporate firms, we compare financing relationships for private and public firms. Leverage ratios are lower for public firms and the difference is almost entirely driven by private firms' stronger reliance on short-term debt. We also find that private and public firms' debt financing responds differently to industry shocks. In periods of positive industry shocks, private firms rely more on long-term debt than public firms, while the former use more short-term debt when industry conditions deteriorate.

JEL classification: G30, L11
Bank classification: Financial markets; Credit and credit aggregates

Résumé

De nombreux travaux empiriques ont été consacrés aux différences entre les structures de financement des entreprises, mais, faute de données suffisantes, le financement des sociétés privées (c'est-à-dire non cotées en bourse) a été peu étudié. Les auteurs s'appuient sur des données administratives confidentielles pour comparer les relations entre les déterminants du financement dans les sociétés privées et les sociétés cotées. Le ratio de levier financier est plus faible dans les sociétés cotées, et cette caractéristique s'explique presque uniquement par le fait que les sociétés privées recourent davantage à l'emprunt à court terme que les sociétés cotées. Les auteurs constatent par ailleurs que les chocs sectoriels ont des effets contrastés sur les moyens de financement utilisés par chaque catégorie de sociétés. Chez les sociétés privées, l'emprunt à long terme est plus fréquent en période de croissance sectorielle que chez les sociétés cotées; par contre, l'emprunt à court terme redevient plus fréquent quand la conjoncture se dégrade.

Classification JEL : G30, L11
Classification de la Banque : Marchés financiers; Crédit et agrégats du crédit

Non-technical Summary

Corporate capital structure has received a great deal of attention from economists, since it plays an important role in many real economic decisions, including fixed business investment, inventory investment, research and development expenditures, product market strategy, and employment decisions. Most papers on capital structure focus on testing the static trade-off model in which firms form a leverage target that balances costs (financial distress costs, stockholder-bondholder agency conflicts) and benefits (tax savings, mitigated manager-shareholder agency costs) of debt, and the pecking-order theory in which firms follow a financing hierarchy aimed to minimize adverse selection costs of security issuance. The bulk of this attention has focused on understanding capital structure decisions of public corporations using readily available accounting data, without yielding insight into the determinants of the capital structure of private firms, which represent a significant portion of a country's production base.

The goal of this paper is to shed light on the determination of the corporate financial policy of private companies using the population of all Canadian firms. Specifically, we address the following questions: does a firm's access to external equity markets affect its choice between financing with debt or equity? Does the debt maturity structure differ for private and public firms? Do industry conditions play a role in private and public firms' leverage and debt maturity choices?

We find robust evidence that private firms rely on significantly more leverage than public firms do. In terms of debt maturity, private firms rely more on short-term debt compared to public firms. Importantly, we highlight the economic circumstances in which these leverage and debt maturity disparities between private and public firms hold. In times of positive industry shocks, private firms rely more on debt financing as opposed to relying on internal equity funding. Industry conditions play an important role in debt maturity as well. Private firms use more long-term debt when industry conditions are good, and rely more on short-term debt when industry conditions deteriorate. These results have implications for understanding how financing policies of private and public firms evolve with industry conditions.

1 Introduction

A large body of empirical literature examines the determinants of corporate capital structure.[1] Due to data limitations, empirical work on capital structure focuses almost exclusively on publicly traded firms without shedding much light on the financial decisions of private firms.[2] This lack of knowledge regarding the capital structure of private firms, especially young and small ones, is unfortunate, since they represent most of the economy. For example, Table 1 shows 99.5 percent of all incorporated firms are private in Canada; they comprise 90 percent of the employment and between 80 and 90 percent of total sales in any given year.[3]

This paper fills the empirical gap regarding the differences between the financing behaviour of private and public firms by addressing the following questions. How does a firm's access to external equity markets affect its choice between financing with debt or equity? Does the debt maturity structure differ for private and public firms? Do industry conditions play a role in private and public firms' leverage and debt maturity choices? We address these questions by investigating the financial choices of all Canadian corporate firms for the period 2000 to 2008 using an administrative tax-employment database known as the GIFI-T2LEAP.

Financial policies of private and public firms differ substantially. Figure 1 shows firm movements across four transitions between private and public states: (i) firms going from private to public (IPO); (ii) firms moving from public to private (Delist); (iii) firms staying private; and (iv) firms staying public. There is a stark difference between the leverage (debt over assets) and debt maturity (long-term debt over debt) of IPO-type firms and the rest—after going public, firms rely on leverage and longer debt maturity relative to all other types. As for the other transitions, debt maturity and leverage do not vary greatly. These large differences in leverage and in the maturity structure of leverage across private and public firms motivate our research questions.

[1] See Parsons and Titman (2008) and Graham and Leary (2011) for detailed literature reviews on capital structure.

[2] Exceptions include Schoubben and Hulle (2004); Brav (2009); Saunders and Steffen (2011).

[3] Brav (2009) points out that more than two-thirds of corporate assets are owned by private firms in the United Kingdom.

How does a firm's access to external equity markets affect its choice between financing through debt or equity? According to the pecking-order theory of Myers and Majluf (1984), asymmetric information drives the capital structure decisions of firms. When investors decide whether to finance private firms, they rely on less readily available information and hence find it more costly to assess a firm's risk profile. These information asymmetry costs are likely to be higher for private firms. These firms should use stock issuance only as a last resort, after cheaper, less information-sensitive alternatives (like bank and public debt) have been exhausted. Being more opaque, private firms are exposed to greater information asymmetries and hence have a relatively higher cost of equity to debt than public firms. After controlling for capital structure determinants, we find that the leverage of private firms is 12 percent higher than for public firms in Canada.

Next, we examine whether the debt maturity structure differs for private and public firms. This is important because reliance on short-term debt exposes firms to roll over risk.[4] To the extent that private firms contribute substantially to the economy, their strong reliance on short-term debt may have important implications for financial stability when they are unable to rollover their credit, particularly during downturns when credit financing is needed the most. On the other hand, using short-term debt can be advantageous because investors can attenuate the effects of asymmetric information in private firms by forcing firms to revisit creditors more frequently. Lenders may refuse to renew financing if they are concerned about debt repayment. To the extent that private firms obtain more financing by banks, they are likely more exposed to short-term debt monitoring. Another possibility is that firms with high information asymmetry issue short-term debt to avoid locking in their cost of financing with long-term debt if they expect to borrow at more favorable terms in the future (e.g., Barclay and Smith (1995)). Our hypothesis is that private firms, facing more asymmetric information problems and having fewer financing options, are expected to rely more on short-term debt than public firms. Our results show that even after controlling for firm time-varying factors and

[4]Rollover risk is associated with a firm's inability to refinance (or roll over) its short-term debt at the same terms.

unobserved firm heterogeneity, private firms have 6.2 percent higher (lower) short-term (long-term) debt compared to public firms.

The third question that we examine is how private and public firms' financing reacts to common industry shock.[5] There is an extensive literature on the relationship between firm financing and real conditions, showing that firms react differently to industry shocks (e.g., MacKay and Phillips (2005); Maksimovic and Zechner (1991)). Relying on a sizable between-industry variation of shocks, we examine whether the leverage and debt maturity of public and private firms react differently to those shocks. The cost of asymmetric information is higher when industry conditions are less favorable; as a result, private firms rely on securities that are less information-sensitive, such as debt financing. Another explanation is that negative sales shocks, driven, for example, by demand factors, make private firms more vulnerable to losses, and hence more likely to obtain short-term debt instead of long-term debt.

Our results show that, compared to public firms, private firms rely slightly more on debt financing when industry conditions are favorable. A similar result holds when the volatility of the industry environment is low. Regarding debt maturity, private firms use more long-term debt than public firms do when industry conditions are good, and rely more on short-term debt under unfavorable industry conditions. These findings are important because they reveal that private firms rely more on short-term debt when industry shocks are negative.

Our paper contributes to the literature by being the first to examine the leverage choices of *all* non-financial firms in the economy. Using a subsample of large U.K. private firms, Brav (2009) documents that private firms rely more on debt financing than do public firms, and that they rely more on short-term debt financing. We confirm these findings using the sample of all firms in Canada, and extend the analysis by documenting that the debt financing and debt maturity of private and public firms respond differently to common industry shocks. Our findings allow us to determine the channel through which private firms achieve longer debt maturity—these firms have higher short-term

[5]Our shock measure varies by two-digit NAICS industry codes over time; it is computed by aggregating firm-level unexpected sales growth at the industry level. For more details see section 5.

leverage than public firms; however, this is the case only if the industry conditions are poor. Otherwise, they rely more on long-term debt. By looking at the effect of industry-growth shocks on leverage, we contribute to the literature on leverage cyclicality (e.g., Covas and Haan (2011); Erel, Julio, Kim, and Weisbach (2012)).

Several papers focus on financial policies in private firms. For example, Gao, Harford, and Li (2013) document that the cash holdings of private firms are much lower than those of public firms; Maksimovic, Phillips, and Yang (2013) find that private firms participate less in mergers and acquisitions and they are less cyclical in terms of acquisitions; Michaely and Roberts (2012) show that private firms smooth dividends significantly less than do public firms. We complement this literature by examining debt financing in private and public firms.

The rest of the paper is organized as follows. The next section discusses the related literature, which leads to the testing of generated hypotheses. Section 3 discusses the data and sample characteristics of public and private firms. Section 4 reports the main results, and section 5 presents results regarding the effects of an industry shock to debt financing. Section 6 offers some conclusions.

2 Related Literature and Hypotheses

This section reviews various explanations for the use of debt and its maturity structure in private and public firms. Leverage choices in private firms can be explained in the context of a pecking-order theory and information asymmetry. According to the *pecking-order theory* developed by Myers and Majluf (1984), information asymmetry between managers and investors creates a preference ranking of financing sources.[6] If a firm is subject to strong asymmetric information, it is less likely to rely on information-sensitive securities. Suppose that there are three sources of funding available to firms: retained earnings, debt and equity. Retained earnings are not sensitive to asymmetric informa-

[6]In this section, we focus only on those capital structure theories that are relevant to explain leverage differences between public and private firms. Additional capital structure theories include the trade-off and market-timing theories. According to the trade-off theory, capital structure is determined by a trade-off between the benefits of debt and the costs of debt. In the market-timing theory, firms tend to issue equity following a stock price run-up.

tion problems between managers and investors. Equity, on the other hand, is sensitive to stronger adverse selection problems, while debt has a relatively lower sensitivity to adverse selection problems than equity. Hence, from the viewpoint of an outside investor, equity is strictly riskier than debt, resulting in a higher rate of return. From the perspective of insiders, retained earnings are a cheaper source of funding than debt, and debt is preferable to equity financing. Ultimately, if available, a firm will fund all projects using retained earnings.

Differences in ownership structure can drive firms' capital structures. Having at most a few shareholders, private firms are expected to value control more than public firms, which typically have dispersed ownership. Faced with a risk of losing control, private firms can be reluctant to use equity financing, and hence choose to increase their leverage.

Using a sample of private and public firms in the United Kingdom during the period 1993 to 2003, Brav (2009) finds that debt-equity ratios in public firms are significantly lower than in private firms. Having easier access to capital markets, public firms access these markets more often than private firms. Brav (2009) argues that leverage in private firms is more sensitive to operating performance but less sensitive to traditional trade-off theory determinants, such as proxies for growth opportunities. Saunders and Steffen (2011) document that private firms bear a significantly higher borrowing cost of syndicated loans than public firms for the period 1989 to 2007. They argue that higher costs of information production in private firms are an important determinant of the higher loan costs in private firms.

To summarize, private firms are more opaque than public firms and thus subject to stronger information asymmetry. According to the pecking-order theory, firms that are more opaque to outsiders would prefer debt to equity financing, since the former is less sensitive to information asymmetry. The cost of debt in private firms is expected to be lower than the cost of equity, which makes the former a more attractive source of financing than the latter.

Hypothesis 1: Private firms have higher leverage than public firms, all else equal.

The level of information asymmetry can affect the debt maturity structure in private

firms. Barclay and Smith (1995), Berger, Espinosa-Vega, Frame, and Miller (2005) and Custódio, Ferreira, and Laureno (2013) find that firms with higher information asymmetry issue more short-term debt. According to these studies, firms choose a debt maturity structure that will minimize the effect of asymmetric information on the cost of financing. Firms with a higher level of information asymmetry will prefer short-term debt, to avoid paying costs related to asymmetric information over a prolonged period of time if financed with long-term debt. This behaviour relies on the assumption that firms expect to borrow at more favorable terms in the future. To the extent that private firms bear higher asymmetric information costs, they are expected to rely more on short-term debt than public firms, holding all else equal.

Another explanation for higher short-term debt in private firms is based on supply-side factors. Since private firms rely mainly on bank loan financing, they are exposed to intensive monitoring by banks. By reducing the maturity of debt, a creditor secures a stronger bargaining position and exposes borrowers to rollover risk.

> **Hypothesis 2:** Private firms have higher short-term leverage than public firms due to greater asymmetric information, all else equal.

The effect of information asymmetry on debt financing varies over the business cycles. Covas and Haan (2011) show that both debt and equity issuance by listed U.S. firms are procyclical as long as the largest firms are excluded. Erel, Julio, Kim, and Weisbach (2012) study U.S. public firms' debt issuance in varying macroeconomic conditions. They find that credit quality affects a firm's ability to raise capital during economic downturns. Capital demand theories argue that asymmetric information costs are higher in times of downturns. According to credit supply theories about "flight to quality," such as by Caballero and Krishnamurthy (2008), investors become more risk averse and supply relatively safer securities if volatility and economic uncertainty increase during recessions. To the extent that private firms bear higher asymmetric information costs and hence become less safe, we would expect a more pronounced increase in leverage in private than public firms in downturns. Industry conditions can affect debt maturity as well. Short-term debt fluctuates more with changes in information about firm value than long-

term maturity securities (e.g., Erel, Julio, Kim, and Weisbach (2012)). Since private firms are more opaque, they should rely on short-term debt to avoid the costs of information asymmetry in times of unfavorable industry conditions.

> **Hypothesis 3:** Private firms rely more on short-term leverage than public firms in less favorable industry conditions, all else equal.

3 GIFI-T2LEAP and Sample Characteristics

This research uses the unique GIFI-T2LEAP database, which contains detailed balance-sheet information on incorporated firms within Canada. Statistics Canada created the GIFI-T2LEAP database by merging two administrative databases: (i) the General Index of Financial Information-Corporate Tax Return File (GIFI-T2) and (ii) the Longitudinal Employment Analysis Program (LEAP). The GIFI-T2 database tracks all incorporated firms that file a T2 form with Revenue Canada at the four-digit NAICS industry level in a given year. The database contains the typical large corporate firms, as well as a great number of sole proprietorships and partnerships. The database tracks any firm filing a T2 corporate income tax return, as opposed to an individual tax return. Within Canada, owners of sole proprietorships and partnerships have two options for tax purposes: (i) incorporate to file a T2 corporate tax return; or (ii) remain unincorporated and report any firm profits as income on their personal income tax return. The database effectively covers the universe of incorporated Canadian firms hiring workers. GIFI-T2 is used to assess firm-specific annual financial variables such as profit, total debt, short-term debt, long-term debt, equity, total assets, current assets, capital assets, tangible assets, sales and location. The database contains firm-level information for the years 1984-2008. However, detailed balance sheet and financial information became available only in 2000 with the introduction of the General Index of Financial Information (GIFI). Thus, the sample period runs from the years 2000 to 2008.

Public corporations can raise funds by issuing shares on a designated stock exchange. Canadian tax law distinguishes between public and private firms. A private company is either a Canadian-controlled private corporation (CCPC), defined as "resident and

incorporated in Canada, and not controlled directly or indirectly by non-residents, a public corporation or any combination thereof," or other private corporation, defined as "a private corporation, resident in Canada, not a public corporation, and not controlled directly or indirectly by one or more public corporations (or prescribed federal Crown corporation)." A public corporation is "resident in Canada, and having a class of shares listed on a prescribed Canadian stock exchange, or has elected to be a public corporation upon complying with certain conditions regarding size, number and dispersal of shareholders, or has been designated as a public corporation by the Minister of National Revenue," or a corporation controlled by a public corporation, defined as "any Canadian corporation that is a subsidiary of a public corporation (not a public corporation for tax purposes)."

3.1 Summary Statistics

Table 1 breaks down our sample across years. The sample contains 560,256 firms with 3,172,601 firm-year observations. There are 3,475 publicly traded firms in the sample, which provide 15,858 firm-year observations. We note that, over the 2000-2008 sample period, the fraction of public firms remains relatively constant at 0.5 percent.[7] In terms of industry distribution, as reported in Table 2, 20 percent of all public firms are in manufacturing (NAICS 31-33); 15 percent in mining, quarrying, and oil and gas extraction (NAICS 21); and 13 percent in professional, scientific and technical services (NAICS 54). As for private firms, 16 percent are in the construction of buildings (NAICS 23), followed by professional, scientific and technical services (NAICS 54), and retail trade (NAICS 44), contributing 15 percent and 14 percent, respectively. Consistent with previous studies, we exclude firms in the financial sector (NAICS 52-53) and public administration (NAICS 91).

Regarding the relative importance of private firms in the economy, Table 3 shows that they contributed 92 percent to total employment in 2000 and 87 percent in 2008. They also accounted for 84 percent of overall profitability in 2000 and 77 percent in 2008. In

[7]We compare the total number of firms in COMPUSTAT and the number of firms in our sample. The total coverage of public firms in COMPUSTAT is 2,869, or 82 percent of the population.

terms of sales, the relative contribution dropped from 90 percent to 83 percent from the start of the sample in 2000 to the end in 2008. The largest drop was in the contribution to total assets: in 2000, private firms comprised 76 percent of all assets and only 57 percent in 2008. Although the relative importance of private firms declined over the period 2000 to 2008, their absolute contribution to the economy was still significant.

Table 4 provides sample summary statistics. We winsorize each variable at 1 and 99 percent. The ratios of total debt to assets is 44 and 50 percent for public and private firms, respectively. A sample means test rejects the null hypothesis that leverage in public and private firms is the same at the 1 percent level. This evidence is consistent with Brav (2009), who uses a sample of U.K. firms in which private firms have a 32.7 percent leverage ratio and public firms have a leverage of 22.7 percent. Using U.S. data, Gao, Harford, and Li (2013) also document that leverage for private firms is much larger than for public firms. In our sample, leverage falls over time for both private and public firms; however, we also observe that leverage remains higher in private firms for each year.

There is a difference in the maturity structure of debt financing between private and public firms. The average long-term leverage defined as a percentage of long-term debt to total debt is 33 percent in public firms and 29 percent in private firms. This difference is statistically significant and it is preserved for each year in our sample. In contrast, the average short-term debt as a percentage of total debt is close to 70 percent in private firms and approximately 65 percent for public firms. Statistically significant differences in short-term leverage between private and public firms are observed for each year.

In terms of sales, Table 4 shows that public firms are larger than private firms. This is also observed for the U.K. firms studied by Brav (2009) and the U.S. firms examined in Gao, Harford, and Li (2013). Over the whole sample period, public firms are less profitable than private firms and private firms exhibit much higher levels of tangibility than public firms. To examine how all these factors jointly affect leverage, in the next sections we implement multivariate analysis to test our hypotheses.

Figures 1 and 2 plot changes in firm characteristics up to four years before and after a firm becomes public (IPO) or private (Delist). Figure 1 plots leverage, long-term and

short-term leverage, log amounts of debt, and long-term and short-term debt.[8] Starting with leverage (left-hand-side graph), we observe that the leverage of IPO firms shows a slight decrease compared to firms that remain public through the whole period. In the long-term and short-term leverage graphs, we clearly see that the long-term debt of IPO firms increases, noting that the increase actually starts a year before the IPO year. The opposite holds for short-term leverage. Since the after-IPO decrease in short-term leverage is slightly larger than the increase in the long-term leverage for the IPO firms, the total effect adds up to a slight decrease. Similar conclusions hold when looking at the log amounts (the second row of graphs).

Figure 2 reveals some interesting patterns. Starting with sales, IPO firms experience a short increase in sales after becoming public, and the opposite holds for firms that delist. A similar pattern is observed for assets. The sales growth of IPO firms decreases sharply. Profitability increases in the year after the IPO year, followed by a gradual decrease over time.

4 Main Results

In this section, we study the determinants of leverage ratios, as in Rajan and Zingales (1995) and Hovakimian, Opler, and Titman (2001), among others. We estimate the following regression specification:

$$Leverage_{it} \;=\; \alpha Private_{it} + \beta X_{it-1} + \eta_i + \epsilon_{it}, \tag{1}$$

where $Private$ is an indicator variable that takes one if a firm is private and zero if it is public. X_{it-1} is a set of several control variables: profitability ($Profitability_{t-1}$), log size (firm sales) ($LogSize_{t-1}$), tangibility ($Tangibility_{t-1}$) and sales growth ($Sales\ Growth_{t-1}$). These four factors have been found to be the major determinants of firm leverage. We use three different definitions for leverage: total debt over total assets—leverage, long-term debt over total debt, long-term debt over total assets. To control for time-invariant firm heterogeneity, we include firm fixed effects (η_i).

[8] In the regression specifications, the variable *Private* includes firms that remain private for the whole sample period and firms that delist; public firms are those that are public for the whole sample period and firms that switch from private to public.

Table 5 reports results from pooled OLS regressions. The estimate of the dummy variable for a firm's status (*Private*) is positive and significant, suggesting that private firms have higher leverage after controlling for time-variant firm factors, year and industry fixed effects (2-digit NAICS). The 12 percent difference in total leverage between private and public firms is both economically and statistically significant. This result is consistent with our Hypothesis 1 defined in section 2.

Profitability is negatively correlated with total leverage: a one percent increase is associated with an 11 percent decrease in leverage. The trade-off theory predicts that profitable firms use more debt because they have a lower expected cost of financial distress and find the interest tax shield more valuable. The pecking-order theory, on the other hand, predicts that leverage and profitability are negatively related because firms prefer internal over external funds. Holding investments and dividends fixed, more profitable firms will become less levered over time. Our result is consistent with the pecking-order theory.

Tangibility is positively correlated with leverage. Being a proxy for collateral, higher collateral values suggest that the firm can issue more secured debt. It also suggests a higher liquidation value, which lowers a firm's bankruptcy costs and hence increases the capacity to borrow.

The estimate on firm size suggests that a one percent increase in firm size is associated with a 3.7 percent increase in leverage. Larger firms are likely to be more diversified and hence are more likely to have lower default risk. The trade-off theory predicts that lower bankruptcy costs increase the availability of debt financing, which is consistent with our result.

The estimate on sales growth in column 1 is positive and significant.[9] One reason could be that, because firms do not have enough internal funds to finance their strong growth opportunities, they will choose to increase their leverage. Since sales changes represent outflows, they directly increase the financing deficit, resulting in a positive

[9]We use sales growth as opposed to the market-to-book ratio as a proxy for growth opportunities because private firms do not have market values. Both measures are conceptually different because the market-to-book ratio as a market-based measure contains forward-looking components of expected growth, unlike firm-level sales growth.

relationship between sales growth and leverage according to the pecking-order theory. An explanation for the negative relationship between sales growth and leverage is that highly levered firms may not be able to undertake profitable investment projects and growth opportunities (e.g., Myers (1977)). A firm with high-growth opportunities may choose less debt to lower its bankruptcy costs and to build financial slack for new investment projects.

We estimate the same leverage regressions separately for private and public firms, see columns 2 and 3 of Table 5. With the exception of the estimate on sales growth in column 3, all other coefficients across columns 2 and 3 preserve their signs from column 1. The leverage of private firms is positively related to the growth rate of sales, while leverage in public firms exhibits the opposite relationship, though not significantly.

The coefficient on profitability is negative for both public and private firms, but is larger in magnitude for private firms. This result is consistent with the hypothesis that private firms prefer internal over external capital more than public firms do, because private firms face higher costs to access the capital markets than do public firms. Brav (2009) also finds support for this explanation using a sample of private and public firms in the United Kingdom. Leverage increases as tangibility rises for both private and public firms, with leverage-tangibility sensitivity higher for public firms. Finally, the coefficient on firm size is virtually identical for private and public firms.

Since public and private firms differ substantially in terms of size, in columns 4 and 5 we split the sample into firms above and below the median firm size. This split into *small* and *large* firms is done to ensure a more accurate comparison within each size group. The sample of large firms includes most public firms and large private firms, while the sample of smaller firms is dominated by private firms. The effect of a firm's status on leverage for both subsamples is basically the same, 14 percent. The sensitivity of leverage to profitability and sales growth seems to be much stronger for larger firms than smaller firms. Tangibility is a more important determinant of leverage for smaller than for large firms. All specifications in Table 5 include industry fixed effects, since it has been found that firms adjust their leverage according to the median industry leverage (e.g., Hovakimian, Opler, and Titman (2001)).

Table 6 reports the same specifications as in Table 5, but includes firm fixed effects. It has been found that unobserved heterogeneity at the firm-level plays an important role in explaining leverage ratios (e.g., Lemmon, Roberts, and Zender (2008)). A firm's status is strongly correlated with firm-specific unobservable factors, and not including these factors may result in biases in the estimate of a firm's status. Firm fixed effects sweep away any time-constant firm-specific effects. To the extent that a firm's status does not change over the sample period, both effects are strongly correlated and hence hard to estimate together in one regression specification. Nevertheless, our results suggest that firm status and firm fixed effects have meaningful effects in the leverage regressions. In column 1 of Table 6, the estimate on private status is 3 percent compared to 12 percent when firm fixed effects are not controlled for.

The estimates with firm fixed effects are comparable to the OLS estimates except for the magnitude of the coefficients. Table 6 confirms that including firm fixed effects is important since the ρ correlation parameter (the ratio of firm-to-total variance) is about 0.80. Overall, higher leverage in Canadian private firms can be explained to some extent with traditional leverage theories such as pecking-order and trade-off theories. Yet, these theories do not allow us to identify the main channel through which a firm's status affects leverage. Next, we determine the debt structure of firms by examining how short-term and long-term leverage differs across public and private firms.

Table 7 reports results for three different measures of leverage as dependent variables. In column 1 the dependent variable is total leverage measured as the ratio of total debt to total assets, and in columns 2 and 3 the dependent variables are the ratio of long-term debt over total debt and long-term debt over total assets, respectively.[10] In column 2, the results indicate that private firms have 6.2 percent lower long-term debt compared to public firms. These findings indicate that, when examining total debt, the higher leverage for private firms arises from higher short-term debt, which helps to refine the channel through which private firms increase their leverage. This finding is consistent with theoretical models such as Flannery (1986), according to which, when asymmetric information is more acute, as in the case of private firms, shorter maturity debt is

[10]See Appendix A.1 for definitions of short- and long-term debt.

preferred.

In column 3 the dependent variable is long-term debt to total assets.[11] The negative estimate on *Private* suggests that long-term leverage over total assets is 2.8 percent lower for private firms. Looking at the estimate of a firm's status in column 2, we note that it is twice as large as the estimate in column 3. Since the ratio of long-term debt over assets includes both the leverage effect and the maturity effect, we see that the maturity effect in column 2 plays a much more important role than the leverage effect.

The estimates on size, sales growth and tangibility take negative signs, unlike in previous specifications. One explanation for the negative relationship between size and debt maturity is that larger firms tap the short-term market because they are not concerned that they will not roll over their debt in the future (Flannery (1986)). Firms with high growth opportunities rely more on short-term debt, possibly because the cost of financial distress increases and hence reduces the availability of long-term debt. Finally, tangibility and long-term debt are negatively correlated. One explanation is that tangible assets are associated with low information asymmetry, which makes equity issuance less costly, hence encouraging firms to switch from long-term debt to short-term debt and more equity.

5 Debt Financing and Industry Conditions

In this section, we explore the effect of unexpected firm sales growth and its within-industry variation on the capital structures of public and private firms. Our analysis is conducted separately for total leverage, long-term debt over total debt and long-term debt over assets.

5.1 Estimating unexpected industry growth and volatility of unexpected firm growth

To measure unexpected industry growth and the volatility of unexpected firm growth, we use the following two-step procedure suggested by Castro, Clementi, and Lee (2011).

[11] The total number of observations in columns 2 and 3 is different because some firms have zero total debt in column 2 and as a result the ratio of long-term debt to total debt cannot be computed.

In the first stage, a firm's sales growth is decomposed into predicted and unexpected components using the following regression:

$$\begin{aligned} \ln(Sales_{it}) &= \alpha_i + \beta_1 \ln(Sales_{i,t-1}) + \beta_2 \ln(Sales_{i,t-2}) + \phi_1 \ln FirmAge_{it} \\ &\quad + \tau d1984_i + \phi_2 [d1984_i \times \ln FirmAge_{it}] + \mu_{it}, \end{aligned} \tag{2}$$

where the residual μ_{it} captures the unexpected component to firm sales growth. The dummy variable $d1984$ takes the value one for firms that existed prior to 1984, since we do not know their exact age, and zero otherwise. In the second stage, both μ_{it} and μ_{it}^2 are regressed against time-specific, two-digit industry dummy variables given in the following equation:

$$\mu_{it} = \sum_{i \in j} \sum_{t} \Psi_{jt} + \varepsilon_{it}, \tag{3}$$

and

$$\mu_{it}^2 = \sum_{i \in j} \sum_{t} \Gamma_{jt} + \nu_{it};, \tag{4}$$

for firm i in industry j at time t. Included in these regressions are a full set of industry-time dummy variables Ψ and Γ.[12] Ψ_{jt} gives the average unexpected firm sales growth within industry j at time t, while $\Gamma_j t$ gives the variance of the unexpected firm sales growth within industry j at time t. The estimated coefficients on the dummy variables in equation (3) estimate the average unexpected sales growth within an industry at a given time ($\widehat{\Psi}_{jt}$), while the estimated coefficients on the dummy variables in equation (4) estimate the volatility of the unexpected firm sales-growth at a given time and industry ($\widehat{\Gamma}_{jt}$).

To examine the effect of industry conditions on leverage, we use these estimated industry sales-growth coefficients ($Unexp\ Growth$ or $\widehat{\Psi}_{it}$) and volatility ($Unexp\ Volatility$ or $\widehat{\Gamma}_{it}$) as separate regressors to the following equations:

$$Leverage_{it} = \alpha Private_{it} + \beta X_{it-1} + \lambda_{11} \widehat{\Psi}_{jt} + \lambda_{12} \widehat{\Psi}_{jt} \times Private_{it} + \eta_i + \epsilon_{it}, \tag{5}$$

$$Leverage_{it} = \alpha Private_{it} + \beta X_{it-1} + \lambda_{21} \widehat{\Gamma}_{jt} + \lambda_{22} \widehat{\Gamma}_{jt} \times Private_{it} + \eta_i + \epsilon_{it}. \tag{6}$$

[12] For the Ψ coefficients, this procedure is equivalent to the inclusion of industry time-specific dummy variables in the firm growth equation (3) via the Frisch-Waugh-Lovell theorem (see Greene (2012)).

Using unexplained firm sales shocks aggregated at the industry level allows us to remove anticipatory effects of industry conditions on leverage. In this way, we can rule out feedback effects between firms' leverage and industry conditions, in which firms expect a change in industry conditions and as a result adjust their leverage, and vice versa. $\widehat{\Psi}_{jt}$ can be viewed as a clean measure of industry shocks that vary across industries and time because of changes in technology and shifts in supply and demand at the industry level. To describe the nature of the shocks, Castro, Clementi, and Lee (2011) show that the variation in the firm sales-growth shock is higher in sectors where product turnover is greater and investment-specific technological progress is faster.

It is important to understand whether industry-growth shocks differ across industries using the Canadian population of firms. If these shocks vary across industries and time, it would be beneficial to use industry-time varying shocks in our leverage regressions, as opposed to collapsing the data at the yearly level. Figure 3 illustrates firm sales-growth shocks aggregated at the industry level $\widehat{\Psi}_{jt}$ and its variation $\widehat{\Gamma_{jt}}$. Based on $\widehat{\Psi}_{jt}$ figure, we note that the unexpected firm sales growth differs between industries as much as it differs within industries, suggesting that the use of collapsed data as shown in the Total category masks a significant heterogeneity in unexpected firm sales-growth. For example, sectors with 21, 22, 54, and 55 NAICS differ substantially from the rest. We note that the within-industry variation in the firm sales-growth shocks ($\widehat{\Psi}_{jt}$) is as large as its between-industry variation. This variability motivates our analysis of industry-level shocks on leverage.

The second graph $\widehat{\Gamma}_{jt}$ depicts the volatility of the firm sales-growth shock for each industry category. With the exception of utilities (NAICS 22), the volatility of the firm sales-growth shock marks an increase over time. The between-industry variation in volatility is 0.049 and the within-industry variation is 0.13, suggesting that the volatility of firm sales-growth shocks share commonality across industries.

5.2 Results: The effect of industry conditions on leverage

In this section, we report whether the financial decisions and debt maturity of individual firms are affected by industry conditions. In columns 1 to 3 of Table 8, the coeffi-

cients of interest are *Unexp Growth* and its interaction with a firm's status *Private*. *Unexp Growth* varies by time and industry and is interpreted as an unexpected shock to firm sales-growth. In column 1, the coefficient on *Unexp Growth* is -0.192, which implies that a one percentage point increase in unexpected industry growth is associated with 21 percent lower leverage for public firms. The coefficient on $Private \times Unexp\ Growth$, which gives the differential impact between private and public firms, is 0.218. Adding the two coefficients gives a value of 0.026, which provides the relationship between leverage and *Unexp Growth* for private firms. The unexpected industry growth has a slight positive effect (statistically significant at the 1 percent level) on the leverage of private firms. This result is consistent with Hypothesis 2, as stated in section 2. When the industry environment is good, public firms, being less subject to asymmetric information compared to private firms, rely on equity financing. Private firms, on the other hand, prefer debt financing as a relatively cheaper source of financing. These results are not affected by the endogeneity of leverage and industry shocks, because we rely on the unexpected portion of industry growth, which is likely not influenced by firms' financial choices.

In column 2, the dependent variable is debt maturity, calculated as the ratio of long-term debt to total debt. This measure allows us to separate the debt maturity decision from the leverage decision. Based on column 2, as *Unexp Growth* increases, long-term leverage falls for public firms (-0.095) and rises for private firms (0.128+(-0.095)). Private firms rely on long-term debt in good times compared to public firms, possibly because the cost of information asymmetry is lower and long-term debt becomes a relatively cheaper source of funding for private firms.

Another interpretation is as follows: when industry-growth slows down (*Unexp Growth* decreases) to the extent that long-term debt is riskier than short-term debt and private firms are subject to greater asymmetric information than public firms, we observe that private firms rely more on short-term debt. This result is consistent with some supply-side explanations, according to which investors become more risk averse in economic downturns (*Unexp Growth* decreases) and shy away from financing firms that are subject to greater asymmetric information (e.g., Caballero and Krishnamurthy (2008)).

In column 3, as a robustness check we use the ratio of long-term debt over assets.

This measure does not separate the maturity decision from the leverage decision as the ratio of long-term debt over debt does (Barclay and Smith (1995)). We note that the results of interest are very similar to those in column 2, suggesting that unexpected firm growth affects debt maturity and long-term leverage in a similar way.

In columns 4 to 6 of Table 8, we examine the role of volatility in firm sales-growth due to unexpected shock, $Unexp\ Volatility$. We use Castro, Clementi, and Lee (2011) to calculate $Unexp\ Volatility$, documented to be higher in industries where product turnover is greater and investment-specific technological progress is faster.

Column 4 reports the impact of $Unexp\ Volatility$ on leverage. Increased variation in firm sales-growth within an industry makes leverage rise for public firms and fall for private firms. The uncertainty of the firm sales shock has a substantial positive impact on the leverage of public firms, and a much smaller negative impact on the leverage of private firms. In column 5, the effect of a one percent increase in volatility leads to lower long-term debt for private firms (-0.101+0.057). In other words, private firms rely more on short-term debt when uncertainty is higher. This result is consistent with Hypothesis 3, according to which private firms, subject to greater information asymmetry, may not be able to secure long-term debt under uncertain economic conditions.

In column 6, the dependent variable is long-term debt over leverage. The results are similar to those in column 5, the only difference being that long-term leverage is positive significant (0.061) if $Unexp\ Volatility$ increases.

Overall, the leverage of private firms increases during positive unexpected industry growth, while it decreases in public firms. Regarding the maturity structure of leverage, we find that long-term leverage rises for public firms and falls for private firms as industry volatility goes up or industry conditions deteriorate, while the opposite is true of short-term leverage.

6 Conclusion

In this paper, we examine leverage choices of private and public firms using the whole population of Canadian firms from 2000 to 2008. There are only a few papers that explore the leverage choices of private firms, due to data limitations. Our data permit

an examination not only of a subsample of private firms, as in previous studies, but of *all* private and public firms. This data coverage ensures that sample-selection issues will not arise from use of a non-random subsample of firms. Three hypotheses are examined:

Hypothesis 1: Private firms have higher leverage than public firms, all else equal.

Hypothesis 2: Private firms have higher short-term leverage than public firms due to greater asymmetric information, all else equal.

Hypothesis 3: Private firms rely more on short-term leverage than public firms when industry conditions deteriorate, all else equal.

Regarding **Hypothesis 1**, the results show that private firms have significantly higher leverage ratios than public firms after accounting for firm-specific differences and unobserved firm factors. This effect remains after we condition for the effects of typical firm-level factors such as size, tangibility, profitability, growth opportunities and firm fixed effects. The effects of these firm characteristics on leverage are consistent with previous studies using U.S. or U.K. data for public firms. When testing **Hypothesis 2**, our results suggest that private firms rely more on short-term leverage than do public firms.

Hypothesis 3 highlights the impact of industry conditions on firm financing. We consider two measures of industry conditions: (i) the unexpected industry sales growth, and (ii) the volatility of unexpected firm sales growth within an industry. When industry conditions are good (i.e., the unexpected industry sales growth increases), public firms rely more on equity financing, while private firms rely more on debt financing; however, the impact of an industry shock on leverage is small for private firms. Importantly, we find that private firms rely on short-term leverage when industry conditions deteriorate. To the extent that private firms contribute significantly to the Canadian economy, their exposure to short-term debt may have important implications for financial system stability if the supply of short-term debt experiences a sudden stop, as witnessed in the last financial crisis.

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A Appendix

A.1 Data Appendix

The data appendix provides details on the assets, equity, short-term debt, long-term debt, debt, profits, tangible assets and sales variables. The following information lists the components of each variable along with the corresponding tax line from the T2 tax forms in brackets. The information is taken from the General Index of Financial Information (GIFI) on the T2 corporate tax return.

1. Total assets (2599) =
    - Total Current Assets (1599) (Cash and deposits (1000) + Accounts receivable (1060) + Allowance for doubtful accounts (1061) + Inventories (1120) + Short term investments (1180) + Loans and notes receivable (1240) + Other currents assets (1480))
    - Tangible Capital Assets (2008) (Land (1600) +Depletable assets (1620) +Buildings (1680) +Machinery, Equipment, Furniture and Fixtures (1740) +Other tangible assets (1900))
    - Intangible capital assets (2178) (Intangible assets (2010) (*i.e.* goodwill, quota, licenses, incorporation costs, trademarks/patents, customer lists, rights, and research and development). + Resource rights (2170))
    - Long term assets (2589) (Due from shareholder(s) and/or director(s) (2180) + Due from members (2190) + Investment in joint venture(s) and/or partnership(s) (2200) + Long term investments (2300) + Long term loans (2360) + Other long term assets (2420))
    - Assets held in trust (2590)
2. Total liabilities and shareholder equity (3640)
3. Total debt = Total liabilities (3499) =
    - Total short-term debt = Total current liabilities (3139)
    - Total long-term debt = Total long-term liabilities (3450)
4. Total shareholder equity (3620) =
    - Common shares (3500) +
    - Preferred shares (3520) +
    - Retained earnings/deficit (3600) (Retained earnings/deficit - Start (3660) + Net income/loss (3680) + Capital contributed at the beginning of the fiscal period (3690) + Dividends declared (3700) + Prior period adjustments (3720) + Other items affecting retained earnings (3740))
5. Total Sales = Total Revenues (8299)

- Total sales of goods and services (8089) +
- Investment revenue (8090) +
- Interest income (8100) +
- Commission revenue (8120) +
- Rental revenue (8140) +
- Vehicle leasing (8150)
- Fishing revenue (8160) +
- Realized gains/losses on disposal of assets (8210) +
- NPO amounts received (8220) +
- Other revenue (8230) (Income/loss on subsidiaries/affiliates + Income/loss on joint ventures + Income/loss on partnerships + Alberta royalty tax credits)

6. Profits = Net income for tax purposes (300)

All variables are measured in nominal terms within the database. We use the Consumer Price Index data available through CANSIM (CANSIM table number 326-0001) to deflate values of these variables.
Accounting rules dictate that:

- total assets (2599) $\equiv$ total liabilities (3499) + total shareholder equity (3620) identity holds.

A.2 Definition: Private versus Public Firms

We classify firms as private or public on the following criteria:

1. Canadian-controlled private corporation (CCPC):
   - Resident incorporated firm not directly or indirectly controlled by non-residents, a public corporation or any combination; or
   - a private, resident corporation not directly or indirectly controlled by one or more public corporations or Federal Crown corporation
2. Public corporation:
   - Resident in Canada and having a class of shares listed on a prescribed Canadian stock exchange; or
   - Any Canadian corporation controlled by a public corporation

Table 1: **Private/Public Distribution of Firms**

Year	COMPUSTAT	Public	Private	All
2000	1,367	1,553	281,956	283,509
2001	1,379	1,708	309,272	310,980
2002	1,436	1,847	332,107	333,954
2003	1,506	1,805	353,241	355,046
2004	1,611	1,799	372,707	374,506
2005	1,738	1,853	385,533	387,386
2006	1,828	1,938	404,192	406,130
2007	1,834	1,943	420,149	422,092
2008	1,811	2,024	440,621	442,645

Note: This table reports the number of firm-year observations for public and private firms over the period 2000 to 2008. Column COMPUSTAT reports the firm year observations for all public Canadian firms present in COMPUSTAT. Firms in the financial sector (NAICS 52-53) and public administration (NAICS 91) are omitted.

Table 2: **Industry Composition**

NAICS	Public	Private	All
11 Agriculture, forestry, fishing and hunting	167	241,356	241,523
21 Mining, quarrying, and oil and gas extraction	2,528	43,802	46,330
22 Utilities	169	2,804	2,973
23 Construction	591	516,153	516,744
31-33 Manufacturing	3,300	295,868	299,168
41 Wholesale Trade	1661	297,070	298,731
44-45 Retail Trade	597	460,718	461,315
48-49 Transportation and Warehousing	529	183,881	184,410
51 Information and Cultural Industries	1,130	47,554	48,684
54 Professional, Scientific and Technical Services	2,088	487,000	489,088
55 Management of companies and enterprises	790	92,214	93,004
56 Administrative and support, waste management	805	171,179	171,984
71 Arts, entertainment and recreation	482	48,957	49,439
72 Accommodation and food services	500	197,668	198,168
81 Other services (except public administration)	1,133	213,554	214,687
Total	16,470	3,299,778	3,316,248

Note: The panel shows the distribution of firms across 2-digit NAICS industry classification. Firms in the financial sector (NAICS 52-53) and public administration (NAICS 91) are omitted.

Table 3: **Contribution of Private Firms to the Canadian Economy**

Year	Number	Employment	Profitability	Sales	Assets	Total Debt
2000	0.995	0.922	0.846	0.900	0.767	0.811
2001	0.995	0.917	0.875	0.888	0.718	0.742
2002	0.994	0.885	0.814	0.847	0.601	0.676
2003	0.995	0.887	0.676	0.831	0.570	0.644
2004	0.995	0.884	0.754	0.822	0.592	0.651
2005	0.995	0.881	0.709	0.810	0.566	0.619
2006	0.995	0.874	0.666	0.817	0.543	0.619
2007	0.995	0.876	0.616	0.809	0.538	0.596
2008	0.995	0.876	0.772	0.830	0.570	0.617

Note: The table shows the proportional contribution of private firms to the aggregate values of employment, profitability, sales, assets and total debt.

Table 4: **Descriptive Statistics**

		Public	Private	Difference
Leverage	Mean	0.440	0.508	-29.250***
	St.Dev	(0.295)	(0.293)	
Long-term Leverage	Mean	0.336	0.295	15.464***
	St.Dev	(0.221)	(0.227)	
Short-term Leverage	Mean	0.655	0.698	-16.220***
	St.Dev	(0.242)	(0.257)	
Size	Mean	14.802	13.029	89.392***
	St.Dev	(2.494)	(1.837)	
Profitability	Mean	0.027	0.120	-47.49***
	St.Dev	(0.243)	(0.275)	
$\Delta \ln Sales$	Mean	0.513	0.188	27.639***
	St.Dev	(1.508)	(0.875)	
Tangibility	Mean	0.402	0.658	-64.861***
	St.Dev	(0.494)	(0.684)	

Note: This table reports means and standard deviation for public and private firms. Leverage is the ratio of total debt to total assets. Long-term leverage is the ratio of long-term debt to total debt. Short-term leverage is the ratio of short-term debt to total debt. Size is the logarithm of firm sales. Profitability is the ratio of net income for tax purposes to total assets. $\Delta \ln Sales$ is the difference in the logarithmic values of firm output from year $t-1$ to year t. Tangibility is the ratio of fixed assets to total assets. The last column reports t-tests.

Table 5: **OLS: Leverage for Public and Private Firms**

	All	Private	Public	Small	Large
$Private$	.120			.139	.138
	(.005)***			(.009)***	(.005)***
$Profitability_{t-1}$	-.110	-.111	-.059	-.058	-.263
	(.001)***	(.001)***	(.015)***	(.001)***	(.003)***
$Tangibility_{t-1}$	.050	.050	.070	.062	.027
	(.001)***	(.001)***	(.010)***	(.001)***	(.001)***
$Size_{t-1}$	.037	.037	.035	.033	.046
	(.000)***	(.000)***	(.002)***	(.000)***	(.000)***
$\Delta \ln Sales_{t-1}$	.023	.024	-.002	.018	.033
	(.000)***	(.000)***	(.002)	(.000)***	(.000)***
Const.	-.148	-.028	.054	-.134	-.281
	(.006)***	(.003)***	(.046)	(.010)***	(.009)***
Obs.	3,172,601	3,156,743	15,858	1,586,301	1,586,300
R^2	.104	.104	.168	.083	.094

Note: The dependent variable is the leverage that is the ratio of total debt to total assets. Size is the logarithm of firm sales. Profitability is the ratio of net income for tax purposes to total assets. $\Delta \ln Sales$ is the difference in the logarithmic values of firm output from year $t-1$ to year t. Tangibility is the ratio of fixed assets to total assets. Columns Small/Large include the sample of firms with sales lower/higher than the sample median. Standard errors in brackets are clustered at the firm level. Year and two-digit NAICS fixed effects are not reported. *** denotes 1% significant level, ** denotes 5% significant level, and * denotes 10% significant level.

Table 6: **Firm Fixed Effects: Leverage for Public and Private Firms**

	All	Private	Public	Small	Large
$Private$	.030			.029	.033
	(.011)***			(.071)	(.011)***
$Profitability_{t-1}$	-.101	-.101	-.095	-.077	-.158
	(.001)***	(.001)***	(.016)***	(.001)***	(.002)***
$Tangibility_{t-1}$	.027	.027	.028	.023	.029
	(.001)***	(.001)***	(.009)***	(.001)***	(.001)***
$Size_{t-1}$	.012	.012	.009	.005	.018
	(.000)***	(.000)***	(.003)***	(.000)***	(.001)***
$\Delta \ln Sales_{t-1}$	.015	.015	.001	.012	.018
	(.000)***	(.000)***	(.001)	(.000)***	(.000)***
Const.	.343	.373	.316	.299	.194
	(.012)***	(.003)***	(.037)***	(.071)***	(.015)***
Observations	3,172,601	3,156,743	15,858	1,586,301	1,586,300
Number of Firms	560256	557325	3475	354168	300549
R^2	.067	.068	.026	.050	.077
σ_u	.269	.269	.277	.289	.248
σ_e	.135	.135	.140	.142	.122
σ	.301	.301	.310	.322	.277
ρ	.798	.798	.797	.806	.805

Note: The dependent variable is the ratio of total debt to total assets. Size is the logarithm of firm sales. Profitability is the ratio of net income for tax purposes to total assets. $\Delta \ln Sales$ is the difference in the logarithmic values of firm output from year $t-1$ to year t. Tangibility is the ratio of fixed assets to total assets. Columns Small/Large include the sample of firms with sales lower/higher than the sample median. Standard errors in brackets are clustered at the firm level. All regressions include year and firm fixed effects. The firm-level variance is σ_u, idiosyncratic variance is σ_e, total variance is σ and ρ is the ratio of firm to total variance. *** denotes 1% significant level, ** denotes 5% significant level, and * denotes 10% significant level.

Table 7: **Debt Maturity**

	Total	Long/Debt	Long/Assets
$Private$	.030	-.062	-.028
	(.011)***	(.013)***	(.010)***
$Size_{t-1}$	.012	-.005	.000
	(.0003)***	(.0003)***	(.0002)
$Profitability_{t-1}$	-.101	-.045	-.048
	(.001)***	(.0009)***	(.0006)***
$\Delta \ln Sales_{t-1}$	.015	-.005	.001
	(.0002)***	(.0002)***	(.0001)***
$Tangibility_{t-1}$	.027	-.002	.003
	(.0006)***	(.0007)***	(.0004)***
Const.	.343	.432	.215
	(.012)***	(.013)***	(.010)***
Observations	3,172,601	3,142,073	3,172,601
Number of Firms	560,256	555,728	560,256
R^2	.067	.006	.018
σ_u	.269	.293	.215
σ_e	.135	.175	.114
σ	.301	.341	.243
ρ	.798	.738	.779

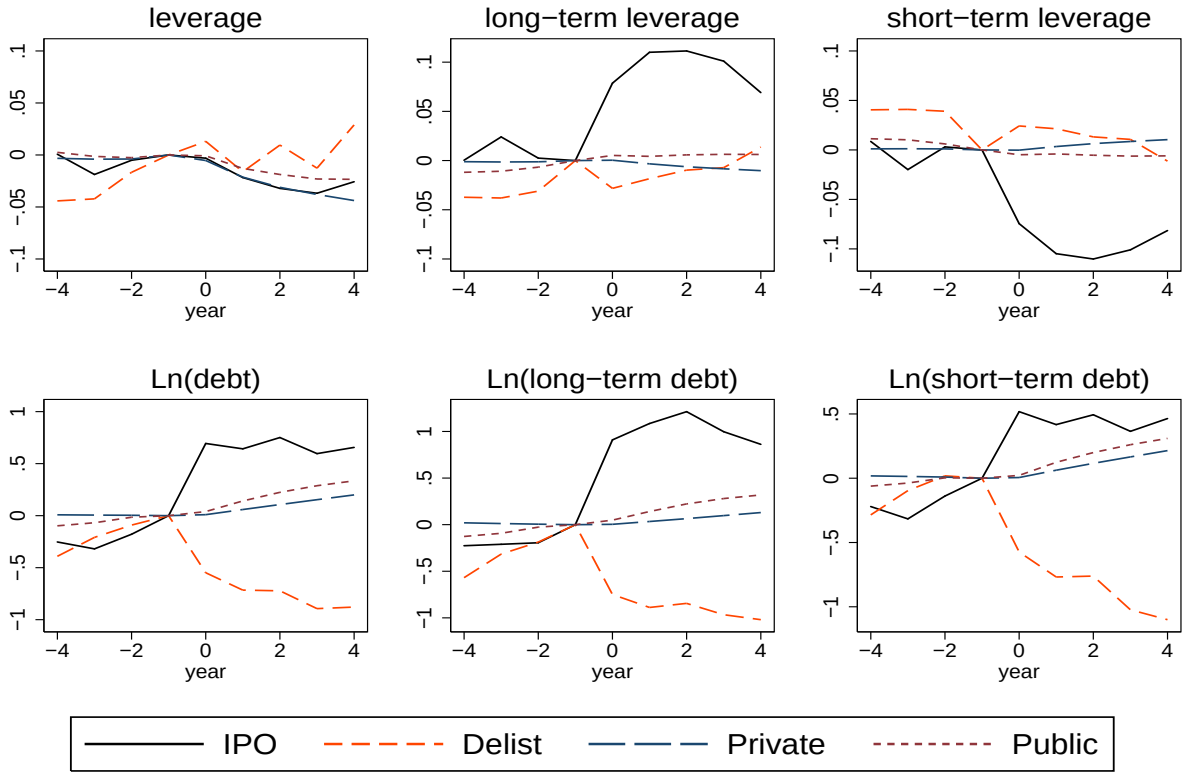
Note: The dependent variable in the **Total** column is the leverage that is the ratio of total debt to total assets. The dependent variable in the **Long/Debt** column is the ratio of long-term debt to total debt, while the dependent variable in the **Long/Assets** is the ratio of long-term debt to total assets. Size is the logarithm of firm sales. Profitability is the ratio of net income for tax purposes to total assets. $\Delta \ln Sales$ is the difference in the logarithmic values of firm output from year $t-1$ to year t. Tangibility is the ratio of fixed assets to total assets. Standard errors in brackets are clustered at the firm level. All regressions include year and firm fixed effects. The firm-level variance is σ_u, idiosyncratic variance is σ_e, total variance σ and ρ is the ratio of firm to total variance.*** denotes 1% significant level, ** denotes 5% significant level, and * denotes 10% significant level.

Table 8: **The Role of Industry Conditions**

	Total	Long Debt	Long Assets	Total	Long Debt	Long Assets
$Private$	.034	-.060	-.027	.110	-.016	.018
	(.011)***	(.013)***	(.010)***	(.019)***	(.022)	(.017)
$Unexp\ Growth$	-.192	-.095	-.087			
	(.033)***	(.050)*	(.028)***			
$Unexp\ Growth$	.218	.128	.123			
$\times Private$	(.034)***	(.050)**	(.028)***			
$Unexp\ Volatility$				.162	.057	.061
				(.032)***	(.038)	(.026)**
$Unexp\ Volatility$				-.174	-.101	-.100
$\times Private$				(.032)***	(.038)***	(.026)***
$Size_{t-1}$	.012	-.005	.0004	.012	-.005	-6.00e-06
	(.0003)***	(.0003)***	(.0002)	(.0003)***	(.0003)***	(.0002)
$Profitability_{t-1}$	-.101	-.044	-.048	-.101	-.044	-.048
	(.001)***	(.0009)***	(.0006)***	(.001)***	(.0009)***	(.0006)***
$\Delta \ln Sales_{t-1}$	.015	-.005	.0007	.015	-.005	.0008
	(.0002)***	(.0002)***	(.0002)***	(.0002)***	(.0002)***	(.0001)***
$Tangibility_{t-1}$	.027	-.002	.003	.027	-.002	.003
	(.0006)***	(.0007)***	(.0004)***	(.0006)***	(.0007)***	(.0004)***
Const.	.339	.430	.212	.268	.404	.185
	(.012)***	(.013)***	(.009)***	(.019)***	(.022)***	(.017)***
H_0: $\sum$ Unexp =0	21.35***	17.75***	55.42***	10.68***	84.43***	163.73***
Observations	3,172,601	3,142,073	3,172,601	3,172,601	3,142,073	3,172,601
Number of Firms	560,256	555,728	560,256	560,256	555,728	560,256
R^2	.067	.018	.018	.067	.018	.018
σ_u	.269	.215	.214	.269	.214	.214
σ_e	.135	.114	.114	.135	.114	.114
σ	.301	.244	.243	.301	.243	.243
ρ	.798	.779	.779	.798	.778	.778

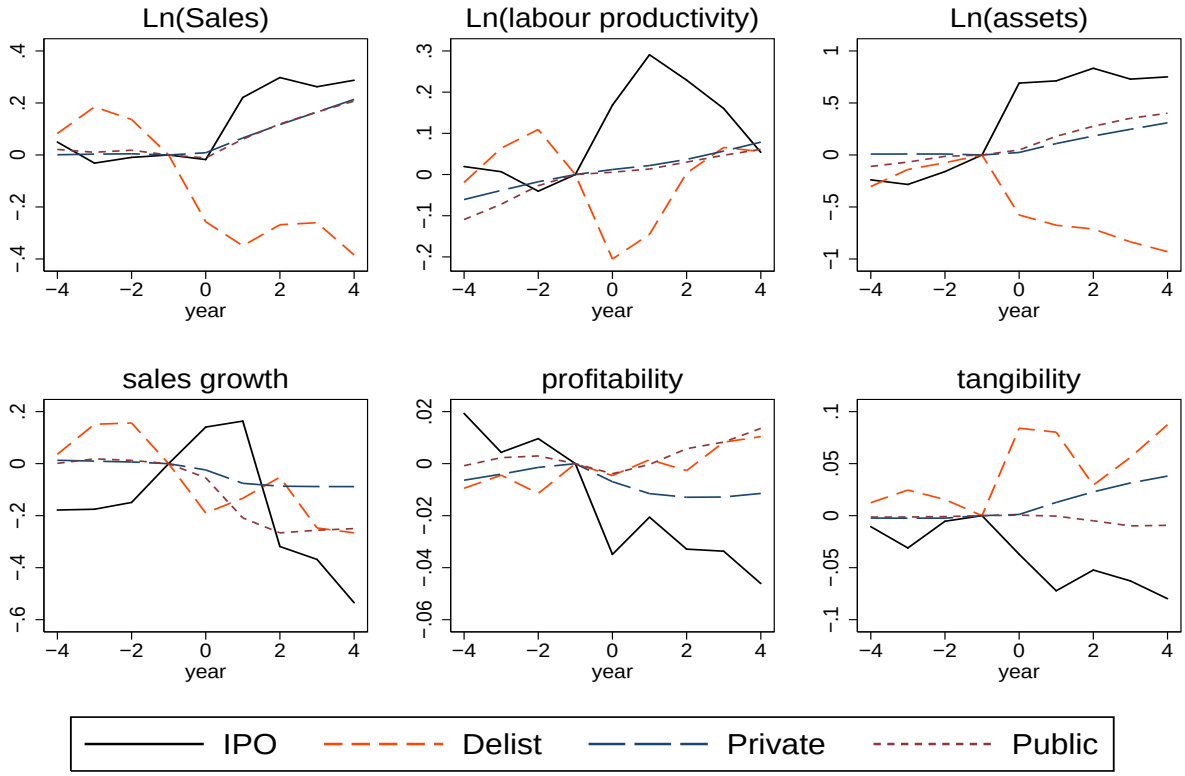
Note: The dependent variable in the **Total** column is the leverage that is the ratio of total debt to total assets. The dependent variable in the **Long/Debt** column is long-term leverage or the ratio of long-term debt to total debt, while the dependent variable in the **Long/Assets** is the ratios of long-term debt over total assets. Size is the logarithm of firm sales. Profitability is the ratio of net income for tax purposes to total assets. $\Delta \ln Sales$ is the difference in the logarithmic values of firm output from year $t-1$ to year t. Tangibility is the ratio of fixed assets to total assets. *Unexp growth* and *Unexp volatility* are defined in section 5.1. Standard errors in brackets are clustered at the firm level. All regressions include year and firm fixed effects. The firm-level variance is σ_u, idiosyncratic variance is σ_e, total variance is σ and ρ is the ratio of firm to total variance. *** denotes 1% significant level, ** denotes 5% significant level, and * denotes 10% significant level. Row H_0 : $\sum$ Unexp= 0 provides the F-statistic on the null hypothesis (*Unexp growth*+*Unexp Growth*×*Private*)=0 or (*Unexp volatility*+ *Unexp volatility*×*Private*)=0.

Figure 1: Changes in Firm Characteristics Resulting from Transitions



Note: These event horizon figures illustrate the evolution of total leverage, long- and short-term leverage for four capital structure states: firms going public (IPO), firms going private (Delist), firms staying private and finally firms staying public.

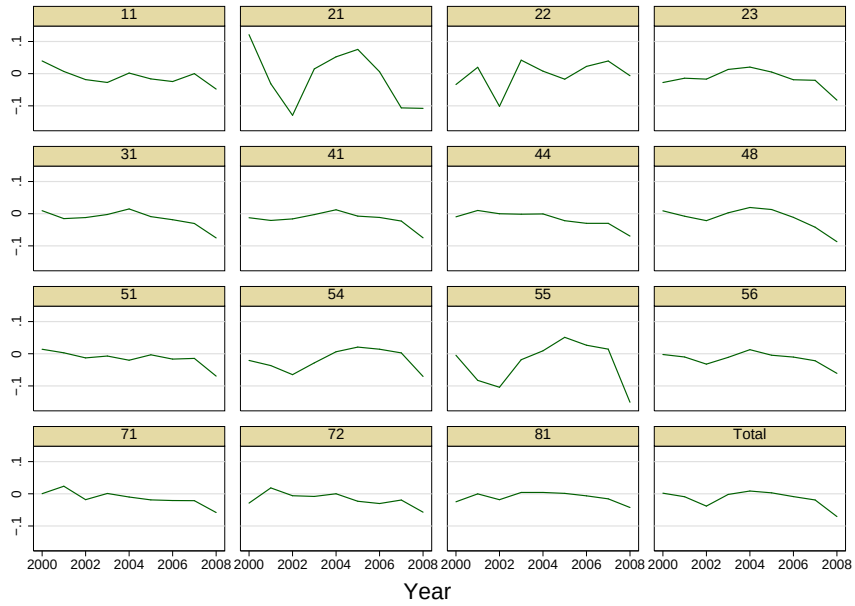
Figure 2: Changes in Firm Characteristics Resulting from Transitions



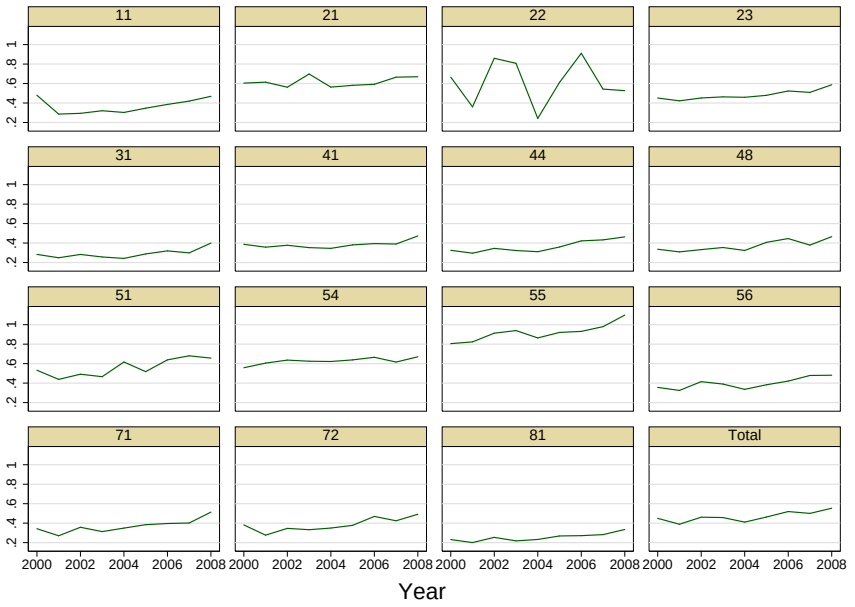
Note: These event horizon figures illustrate the evolution of Ln(Sales), Ln(labour productivity), Ln(assets), sales growth, profitability and tangibility for the four capital structure states: firms going public (IPO), firms going private (Delist), firms staying private and finally firms staying public.

Figure 3: Unexpected Sales Growth and Variance by Industry

Mean ($\widehat{\Psi}_{jt}$)



Variance ($\widehat{\Gamma}_{jt}$)



Note: These graphs show the mean unexpected sales growth ($\widehat{\Psi}_{jt}$) and the variance of unexpected sales growth ($\widehat{\Gamma}_{jt}$) by two-digit NAICS codes. See Table 2 for the definitions of industry codes.