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Firm Size as Determinant of the Nonlinear Relationship Between Bank Debt and Growth Opportunities: The Case of Chilean Public Firms

Paolo Saona Hoffmann, Mauricio Jara Bertín, and Marta Moreno Warleta

ABSTRACT: We analyze the extent to which firm size determines the relationship between growth opportunities and bank debt in the Chilean corporate sector. Using generalized method of moments (GMM) system estimator techniques in an unbalanced panel data of quoted firms, we provide evidence of a U-shaped relationship between growth opportunities and bank debt, which has a different behavior depending on the firm's size. Smaller firms seek private debt sooner than larger firms do when growth opportunities increase. This finding is supported by the institutional characteristics of the Chilean financial system, the higher confidence of small firms in bank debt, and the bank-based orientation of the Chilean financial markets.

KEY WORDS: bank debt, Chilean public firms, firm size, growth opportunities.

Under imperfect capital market conditions, firm value is determined not only by investment decisions but also by debt choices and by the ownership of debt (Modigliani and Miller 1958). We focus on the analysis of bank debt decisions for the Chilean corporate sector. Chile is an emerging economy with a bank-based financial system. Although Chile's financial markets have experienced great development over the past two decades, the main source of financial support for future growth opportunities is still bank debt, especially for smaller firms. Our goal is to expand on the work of Jara et al. (2012) by analyzing the extent to which firm size determines the nonmonotonic relationship between growth opportunities and bank debt in the Chilean context.

Our paper extends the literature on bank debt choice in developed and emerging markets (Demirgüç-Kunt and Maksimovic 2002; Denis and Mihov 2003; Johnson 1997, 1998; López 2005). We also extend Chilean evidence (Jara and Sánchez 2012; Jara et al. 2012) in the following three aspects: (1) We consider specifically the effect of firm size on the bank debt decision, which seems to be largely relevant in emerging civil-law economies. (2) We use growth opportunities, which considers the replacement value of assets, as a better proxy for Tobin's *Q*. This variable has not been used in empirical literature for the Chilean context. (3) We include a new dummy variable, *IPSA*, to differentiate those companies that belong to the market index of the most-traded firms as a proxy for reputation, which enhances the multivariate analysis.

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Using an unbalanced panel data analysis, we verify our research hypothesis that there is a nonmonotonic relationship between growth opportunities and bank debt and that this nonmonotonic relationship is different depending on the size of the firm. We find evidence to support the assertion that small firms turn to bank debt sooner than large firms do as growth opportunities increase. This differential behavior occurs for several reasons: Small and large firms have asymmetric access to external sources other than bank debt; small and large firms have dissimilar likelihoods of insolvency; and the informational gap between firms and capital markets varies depending on firm size in the same way that the cost of debt varies. The results are consistent through a number of robustness tests. These findings might be the cornerstone for future policies related to the development of capital markets in Chile.

Literature Review

Chilean firms present a high ownership concentration, primarily in the hands of individual shareholders or conglomerates, which gives rise to pyramidal structures and the generation of internal capital markets (Lefort and González 2008; Lefort and Walker 2000a). This is explained partially by the political process in the Chilean corporate sector at the second half of the 1980s (Hachette 2001; Larraín and Vergara 2000) and partially as a natural response to a French civil-law system characterized by weak legal protection of investors and creditors (Akisik 2013; Demirgüç-Kunt and Maksimovic 2002; La Porta et al. 1999; Lefort and González 2008; Lefort and Walker 2000b).[1] Despite the great growth experienced by Chile's capital markets in recent decades, the legal system has not given sufficient protection to the investor to avoid such high levels of ownership concentration. On the contrary, the Chilean legal system has traditionally operated in a reactive way toward increasing the flexibility of the capital markets (Iglesias 2000).

Therefore, the source of external funds is a very important decision for nonfinancial firms, especially in civil-law emerging markets. Law and finance literature predicts that both the legal origin and the institutional setting of the country are important factors due to international differences in quality of law and its enforcement that could shape the characteristics of debt contracts (Akisik 2013).[2] These institutional features can help us to explain, among other things, why firms in emerging markets prefer alternative funding sources such as private bank debt (Demirgüç-Kunt and Maksimovic 1998; Djankov et al. 2008; La Porta et al. 1998). In this paper, we analyze how firm size affects the way growth opportunities are financed in the context of a South American emerging market such as Chile.

Nonlinear Relationship Between Bank Borrowing and Growth Opportunities

Theoretical perspectives suggest several reasons to obtain financing from different sources other than bank lending, but no consensus exists about the expected relationship between firm growth opportunities and the level of bank debt (Serrasqueiro and Nunes 2010). According to the pecking-order theory (Myers 1984; Myers and Majluf 1984), if companies choose to borrow from external sources, they have to decide whether it is more convenient to borrow from private lenders (banks and other financial institutions) or public lenders (corporate bonds). This choice between sources of debt can be influenced by several factors, such as the asymmetries of information and the agency cost of debt (Denis and Mihov 2003; James and Smith 2000; Jensen 1986; López 2005). For instance, public lenders suffer from a higher information gap than do private lenders

regarding the future prospects of the firm. This is because of the widespread ownership implicit in public debt (Bessler et al. 2011; Boyd and Prescott 1986). Conversely, due to the concentrated nature of bank debt, these lenders have much more incentive than do public lenders to be more informed about the companies they finance and to reduce ex-post information asymmetries through monitoring (Albring et al. 2011; Houston and James 1996; Meneghetti 2012; Nakamura 1993).

Several arguments based on asymmetric information approaches support a positive relationship between growth opportunities and bank debt. The degree of asymmetric information is usually associated with growth opportunities. The idea that firms with higher levels of growth opportunities prefer to borrow first from private lenders is widely supported by both monitoring and strategic information arguments (Rajan and Winton 1995). For instance, from the signaling perspective, De Andrés et al. (2005) suggest that the disciplining role of bank debt supports a positive relationship between the company's growth opportunities and the level of bank debt. From a strategic perspective, public debt decisions necessarily imply greater information disclosure to public lenders. This could be extremely risky for firms with high levels of growth opportunities and asymmetric information since conveying more information to the market can jeopardize the strategic advantage of the firms' portfolios of investment (Yosha 1995). Therefore, private debt seems to be the best solution to alleviate the problems of unequally distributed information (Denis and Mihov 2003).

The free cash flow hypothesis proposed by Jensen (1986) also predicts a positive relationship between bank debt and growth options. According to the free cash flow hypothesis, managers have incentives to use the free cash flow to undertake negative net present value (NPV) projects in order to enjoy both pecuniary and nonpecuniary benefits associated with the larger dimension of the firm (Jensen). Shareholders will persuade their managers to use higher levels of debt, particularly private debt, because managers will then be obligated to afford periodic payments that reduce the free cash flow available for the consumption of perquisites.

On the contrary, the bank's hold-up problem described by Rajan (1992) arises when firms need to keep their growth opportunities information private. If banks have an informational monopoly about firms, banks will have incentives to engage in opportunistic behavior and try to extract additional rents from these private information advantages (James 1987). Consequently, if hold-up problems are likely to exist, firms will prefer to borrow from public sources rather than from private sources (Yosha 1995).

In addition, Raddatz (2006) suggests that when financial markets are more developed, borrowers and lenders have better tools to deal with information asymmetries that arise from financial relations. The effect of growth opportunities and asymmetric information over bank debt levels will depend on the ability of public lenders to anticipate the agency problems of debt (assets substitution and underinvestment problems).[3] Consequently, if public lenders are less sophisticated and, therefore, have less ability to anticipate the agency problems of debt, a negative relationship between growth opportunities and private debt should be expected. In this case, private creditors will try to prevent those suboptimal investment policies through several mechanisms, such as restrictive debt covenants, the reduction of the stated periods of loan, credit rationing, and greater supervision and control. On the contrary, if public lenders are sophisticated, they can anticipate the agency problems of debt as well as can private lenders. Since public lenders are not able to monitor more effectively than private lenders (Kale and Meneghetti 2011), the only natural reaction to risky debt is to raise the cost of debt. As a result, firms could have incentives to raise private debt.

As we stated above, evidence has not been conclusive with respect to the effect of growth opportunities on the choice of debt source. However, empirical literature suggests that this relationship could be nonmonotonic due to the underinvestment and overinvestment costs (Jara et al. 2012; Morgado and Pindado 2003). Therefore, if we consider the Chilean firms' characteristics, the relationship between growth opportunities and bank debt is an empirical issue that leads to the expectation of a nonmonotonic relation whose behavior will depend on which force is stronger. Finally, we have to note that the strength of each force could be conditioned by a firm's size, business risk, and ability to raise capital.

The Effect of Firm Size on Concentration of Bank Debt

According to the analysis developed in the previous section, firm size seems to be a determining factor not only of the volume of debt financing but also of the ownership of debt. In general, large firms have easier access to public debt markets than do small firms. These findings might be supported by the following three arguments (Andritzky 2003): (1) large firms have relatively lower bankruptcy costs, (2) large firms can diversify much more easily than small firms can, and (3) transaction costs for the issuance of public debt are relatively lower for big firms.

Ghosh (2007) suggests that the factors that influence the concentration of bank debt in total debt vary with firm size. Usually, large firms are more diversified and therefore have less volatile cash flow streams. Consequently, the likelihood of insolvency is lower, and so is the bankruptcy risk. As Rajan and Zingales (1995) mention, the size of the firm seems to be negatively related to the bankruptcy risk. For small firms, the conflicts between lenders and shareholders are higher because the managers of small firms are usually majority shareholders and are in a better position to modify the investment decision from one portfolio to another (Gaud et al. 2005). The model developed by Hackbarth (2009) shows that firms referred to as weak firms—the smallest firms—are forced to get "take it or leave it" credits from banks during the debt renegotiation processes. Large firms, on the contrary, are usually followed by external analysts and are subject to the scrutiny of stakeholders and prospect investors. Therefore, the information gap between large firms and capital markets, and more particularly, lenders, is lower. This argument supports the idea that small firms have higher restrictions to reaching external sources of funds other than bank debt in comparison to large firms (Barclay et al. 1995). Small firms will have higher barriers to issuing public debt (Hovakimian 2006). Therefore, small firms may find that private debt is less costly because this type of debt has a more concentrated nature. However, since the cost of borrowing in the market is high but fixed, it is appropriate only for high levels of debt. This explains why large companies have a greater propensity to issue public debt relative to smaller firms (Fitzpatrick and Ogden 2011).

In terms of prediction, Diamond (1991) and Rajan (1992) observe a nonmonotonic relationship between the quality of the company and the type of debt. The models that have been proposed in the literature generally predict that higher quality firms, usually large, will issue debt through the market, while lower quality firms, the small firms, will use bank debt. Moreover, companies with higher default risk will prefer to borrow through financial institutions since debt renegotiations can avoid inefficient liquidations (Detragiache et al. 2000).

As Diamond (1991) predicts, the effect of information asymmetries varies according to firm size. Small firms, often those without a well-established reputation and with no

easy access to public debt markets, choose high concentrations of bank debt; this occurs when the firm has valuable future growth opportunities. It might be expected that large companies finance their growth opportunities with a lower concentration of bank debt.[4] Evidence indicates that firms of different sizes face changing borrowing opportunities as they grow. Fama (1985) shows that banks can use economies of scale in information production and bridge information asymmetries between borrowers and lenders. The monitoring view implies that a company with performance or investments that are difficult for outsiders to observe will likely use banks as efficient monitors.

Hooks (2003) predicts that a firm with a high credit rating and a well-established reputation chooses to borrow directly from financial markets, issuing commercial papers or publicly traded bonds, because its reputation provides low information-cost access to these markets. Therefore, when small firms have growth opportunities, they will turn to bank debt sooner than large firms, which have more chances to issue other kinds of debt.

Briefly, according to the previous arguments, the hypothesis to be tested might be split into two parts. The first part is that there is a nonmonotonic relationship between growth opportunities and bank debt. The second is that the described nonmonotonic relationship will be different, depending on the size of the firm. For small firms, we should observe that they turn to bank debt sooner than do large firms as growth opportunities increase.

The consideration described above regarding the size of the firm and the concentration of bank debt seems to be supported also by the arguments of the level of financial development of the country. The findings observed by Beck et al. (2008) point out that financial development disproportionately fosters the growth of small firms relative to larger firms. Furthermore, a greater degree of financial development reduces transaction costs, of which informational barriers are one, and this, in turn, promotes development of small firms and access to external sources of funds (Beck et al. 2008). Consequently, the negative relationship between firm size and the concentration of bank debt is more robust the lower the degree of financial development of the country where the firm operates.

In summary, the described nonmonotonic relationship could be expected in the Chilean context, where creditors' legal protection fosters a bank-oriented financial system where banks play a leading role compared with capital markets when financing the investment portfolios of firms (Fernández 2005, 2006; Gallego and Loayza 2000; Hernández and Walker 1993). This nonmonotonic relationship might be determined also by the firm's size because larger companies have a higher propensity to use public debt than do smaller firms. Consequently, large firms are more likely to issue bank debt later than smaller firms will when they have to finance their future growth opportunities. Therefore, when the level of growth opportunities is substantially high, smaller firms with a deficit of funds will first issue private debt through banks with a higher cost of capital because this is the smaller firms' main source of external funds in Chile. Larger firms might use bank debt after exhausting public debt sources, taking advantage of the economies of scale of their larger size.

Variables and Methodology

Source of Information and Variables

To test empirically the research hypothesis, we use an unbalanced panel data of quoted nonfinancial Chilean firms on the Santiago de Chile Stock Exchange. The panel consists of 1,792 firm-year observations for the 1997 to 2008 period, comprising 223 firms with an average of 8.04 year-observations per firm. The data set has been obtained from the

Table 1. Panel data composition by industrial sector

Industrial sector	Observations		Firms		Average market capitalization (CLP 1,000s)
	N	Percent	*N*	Percent	
Agriculture and fishery	128	7.14	14	6.28	327,279
Food and beverage	144	8.04	17	7.62	409,187
Construction	108	6.03	14	6.28	209,736
Electric energy	222	12.39	27	12.11	1,298,098
Mining	188	10.49	24	10.76	276,666
Paper pulp	119	6.64	14	6.28	2,168,117
Telecommunications	122	6.81	13	5.83	349,232
Textile	159	8.87	22	9.87	8,603
Transportation and services	475	26.51	62	27.80	420,972
Other	127	7.09	16	7.17	201,073
Observations	1,792	100.00	223	100.00	

audited financial statements and stock quotations at the end of the fiscal year filed into the Ficha Estadística Codificada Uniforme database, which is provided by the Chilean Superintendencia de Valores y Seguros (Securities and Insurance Supervisor). Although we do not have information for nonquoted companies in order to consider a wider scope of analysis, we believe that our data do not have a selection bias because this study represents approximately 91 percent of market capitalization in Chile, excluding the financial sector (see Table 1). Therefore, we believe that the sample is able to describe the corporate reality of Chilean firms. For example, this study involves the most important industrial sectors in the economy—agriculture and fishery, electric energy, mining, paper pulp, and telecommunications, among others. For this reason, we believe that our sample properly represents the productive fabric of the Chilean economy and includes those firms operating in the corporate sector.

Detailed descriptions of the dependent and independent variables can be found in the Appendix. The dependent variable is bank debt (*BDTD*) (García-Teruel et al. 2009; Saona and Vallelado 2010).[5]

The independent variables, which are widely used in the literature about capital structure decisions, are as follows:

1. the firm's growth opportunity set measured with two alternative proxies—*Q1* (Perfect and Wiles 1994) and *Q2* (Adam and Goyal 2008)—which will be used for robustness purposes;
2. the size of the firm (*LNTAB*) (Bharath et al. 2009; Dennis and Sharpe 2005; Ozkan and Ozkan 2004; Titman and Wessels 1988). We also construct a dummy variable (*DUMMYSIZE*) in order to split the sample into small and large firms. This variable considers the mean of the variable *LNTAB* as the cut point. *DUMMYSIZE* takes the value 1 if the firm has an *LNTAB* value higher than 17.739 (large firm) and 0 otherwise (small firm). As a robustness check, we have also constructed a similar variable (*DUMMYSIZEIND*) in which the cut point between small and large firms is the average of *LNTAB* by industrial sector;
3. the profitability (*ROA*) (Saona 2010; Wald 1999);

4. the collateral (*FATA*) defined as the assets subject to use in default and financial constraints. The collateral is usually related to the asset structure in a liquidation process. The larger the relative tangible assets are, the higher the guarantees of paying off the debt (Črnigoj and Mramor 2009; Flannery and Rangan 2006; Rajan and Winton 1995);
5. the insolvency risk (*SDROA*) (Črnigoj and Mramor 2009). This variable should have a negative relationship with the firm's leverage;
6. the distance from the firm's debt position to the industry average leverage (*DIFD*) (Elsas and Florysiak 2011; Flannery and Rangan 2006; Saona and Vallelado 2012); and
7. the firm's reputation (*IPSA* and *LNAGE*).

Finally, we included dummy variables for the industrial sector in which the firm operates and temporal dummy variables. To reduce the effects of outliers, we have Winsorized all ratios/variables at the first and ninety-ninth percentiles. This technique replaces the values in the 1 percent uppermost and lowermost tails by the next value counting inward from the extremes.

Because it is expected that the current debt decisions depend also on the past decisions, an autoregressive equation model is used, taking the follow form:

$$\begin{aligned} BDTD_{it} = {} & \beta_0 + \beta_1 BDTD_{it-1} + \beta_2 Q_{it} + \beta_3 Q_{it}^2 + \beta_4 LNTAB_{it} + \beta_5 ROA_{it} \\ & + \beta_6 FATA_{it} + \beta_7 SDROA_{it} + \beta_8 DIFD_{it} + \beta_9 IPSA_{it} + \beta_{10} DUMMYTEMP_t \\ & + \beta_{11} DUMMYIND_{it} + \eta_i + \eta_t + \varepsilon_{it}, \end{aligned} \tag{1}$$

where η_i represents the individual effect of each firm i; η_t is the temporal effect for the t periods considered in this study; and ε_{it} is the stochastic error. The individual effect corresponds to the characteristics of the firms considered individually, such as the managerial style, the patterns of financial decisions, and so on, which are assumed to be constant over time. The temporal effect includes all the elements that simultaneously, and with the same intensity, affect all firms in the sample, such as the macroeconomic variables and the legal and institutional setting. The stochastic error takes into account the measurement errors as well as the omission of some independent variables in our model. This model can be used to estimate the value at which bank debt is optimized relative to the growth opportunity set (critical value of growth opportunities). In this case, the critical value is the nonlinear combination $-\beta_2/2\beta_3$.

To test the interaction effect of firm size and growth opportunities on bank debt, we use the following model:

$$\begin{aligned} BDTD_{it} = {} & \beta_0 + \beta_1 BDTD_{it-1} + \beta_2 Q_{it} + \beta_3 Q_{it} * DUMMYSIZE_{it} + \beta_4 Q_{it}^2 + \beta_5 Q_{it}^2 \\ & * DUMMYSIZE_{it} + \beta_6 DUMMYSIZE_{it} + \beta_7 ROA_{it} + \beta_8 FATA_{it} + \beta_9 DSROA \\ & + \beta_{10} DIFD_{it} + \beta_{11} IPSA_{it} + \beta_{12} DUMMYTEMP_t + \beta_{13} DUMMYIND_{it} + \eta_i + \eta_t + \varepsilon_{it}. \end{aligned} \tag{2}$$

Because of the construction of *DUMMYSIZE* (and *DUMMYSIZEIND*), the critical value of growth opportunities for large firms will be $-(\beta_2 + \beta_3)/(2(\beta_4 + \beta_5))$; for small firms it will take the form $-\beta_2/2\beta_4$.

Methodology

Due to the panel structure of our data, which is a combination of cross-sectional and time-series information, we have estimated the model using the generalized method

of moments (GMM). The panel data methodology allows us to control for two basic problems in this kind of study: the heterogeneity problem and the endogeneity problem (Arellano 2002).

The relationships between firms' characteristics and financial decisions must be interpreted carefully because of the possibility of observing spurious relations. One of the factors contributing to the appearance of spurious relations is the endogeneity problem. An exogenous variable is an independent variable whose value is not affected by the dependent variable, which is said to be endogenous. There is an endogeneity problem when one or more of the explanatory variables are not strictly exogenous. To control for this issue in Equations (1) and (2), we use the GMM system estimator proposed by Blundell and Bond (1998) and Bond (2002).

The GMM system estimator is an enhanced estimator of the first-difference GMM estimator, which is based on the endogeneity of the instruments and allows us to eliminate the bias derived from the fixed and specific effects of each firm considered individually.[6] The joint endogeneity of the explanatory variables requires the application of instrumental variables to obtain consistent estimators of the relevant coefficients. Due to the possible weakness of the instruments (Alonso-Borrego and Arellano 1999), the GMM system estimator returns the most efficient and consistent estimations. These estimators are derived under the following assumptions: (1) there is no serial correlation in the disturbance error and (2) there is no correlation between the disturbance term and the individual effect.

The selection of the instruments is central in handling the endogeneity problem. These instruments are based on the contemporary and lagged values of the independent variables that are not strictly exogenous. In our case, the only variable that presents this problem is the growth opportunity set. According to the previous empirical literature on capital structure decisions, the growth opportunity set seems to be an endogenous variable (Bevan and Danbolt 2004; Billett et al. 2007; Danbolt et al. 2002; Dang 2011; Goyal et al. 2002; Krishnaswami and Subramaniam 1999; López and Sogorb 2008; Moon and Tandon 2007; Saona 2010; Saona and Vallelado 2005; Serrasqueiro and Nunes 2010). We require at least two years' lag to allow the explanatory variable to be introduced as an instrument. We test the validity of the instruments using the Hansen test for overidentifying restrictions, which checks the validity of the selected instruments (Arellano 2002; Hansen et al. 1996). Finally, we perform the Wald test of joint significance for all the dependent variables.

The consistency of the GMM system estimator depends on the absence of second-order serial autocorrelation in the residuals and on the validity of the instruments (Arellano 2002; Arellano and Bond 1991, 1998). The GMM system estimator addresses the serial autocorrelation by combining a system of regressions in levels and regressions expressed in first differences, each one of them properly instrumentalized. The instruments for the regression expressed in differences—those that by construction eliminate the firm-specific effect—correspond to the lagged levels of the dependent variables. For the regression in levels, the instruments are the lagged differences of the dependent variables. These are suitable instruments under the assumption that the correlation between the dependent variables and the firm-specific effect is constant across time.

The AR1 and AR2 statistics measure first- and second-order serial correlation. Since first-difference transformations have been used, some level of first-order serial correlation is expected. However, this correlation does not invalidate the results (Gallego and Loayza 2000; López and Crisóstomo 2010; López and Rodríguez 2008).

Results

Descriptive Analysis

In Table 2, we observe that a typical Chilean firm has about 43.8 percent of its total financial debt issued with private institutions. Although aggregate results by Lefort and Walker (2000b) report slightly higher proportions of bank debt relative to total debt (46.0 percent, 47.0 percent, and 51.0 percent for 1990, 1994, and 1998, respectively), Saona and Vallelado (2010) report that the average proportion of private debt in total debt is about 41.0 percent in their sample of Chilean firms for the 1991–99 period. Our descriptive statistics concerning bank debt over total financial debt are similar also to the recent work by Jara and Sánchez (2012), who report an average ratio of 39.6 percent. Bank debt represents 15.4 percent of total assets, which is close to the results reported by Saona and Vallelado (2010) (12.0 percent) and Jara and Sánchez (2012) (12.4 percent). Concerning the two alternative measures of growth opportunities used in this study, *Q1* and *Q2*, we observe that an average firm has future growth opportunities because the means for *Q1* and *Q2* are greater than one. The average profitability (*ROA*) is about 4.8 percent of total assets. Nevertheless, we observe a high standard deviation for this variable (*SDROA*), which means that there is a large dispersion: some firms make very high profits while others perform very poorly. In general, larger firms seem to have a lower insolvency risk than small firms.

The proxy used for collateral (*FATA*) indicates that, on average, 35.1 percent of total assets are fixed assets. In other words, a typical Chilean firm has more current assets than fixed assets. This is a source of inefficient liquidations. Finally, according to the statistics, an average firm has about forty-three years since its founding.

Table 2 includes also the difference-of-means test between small and large firms for all the variables under analysis. The mean for *LNTAB* is the cut point used to differentiate small firms from large firms. We use the mean of *LNTAB* by industrial sector to differentiate small and large firms within each sector. There is a statistically significant difference in the average bank debt (*BDTD* and *BDTA*) between small and large firms. Regardless of the measure used to differentiate between small and large firms, small firms have more bank debt than do the largest firms. This preliminary finding is consistent with the extant literature (Gander 2012; Ghosh 2007; Hooks 2003; Kale and Meneghetti 2011). We observe that large firms, on average, have more growth opportunities than do small firms, but smaller firms have almost double the size of collateral (*FATA*) as a proportion of total assets. Finally, we can say that large firms are older (*AGE*), and most of them are part of the index of the most-traded firms in the Chilean capital market (*IPSA*).

Multivariate Analysis

The Effect of Growth Opportunities on Concentration of Bank Debt

Table 3 describes the effect of growth opportunities on bank debt concentration. As one would expect, the one-period lagged dependent variable ($BDTD_{t-1}$) is positively correlated with the current level of bank debt concentration. In fact, the average coefficient of this variable is 0.396, which means that the changes in the current bank debt concentration are explained in about 39.6 percent of cases by the changes in bank debt concentration in the previous period.

Table 2. Descriptive statistics

	Total sample				Subsample by size based on the mean of LNTAB				Subsample by size based on the mean of LNTAB by industrial sector			
Variables	**Mean**	**SD**	**Min**	**Max**	**Small**	**Large**	**Diff**	***p*-value**	**Small**	**Large**	**Diff**	***p*-value**
BDTD	0.438	0.287	0.000	1.000	0.487	0.397	0.090	0.000	0.473	0.414	0.059	0.001
BDTA	0.154	0.133	0.000	0.714	0.173	0.138	0.036	0.000	0.172	0.141	0.031	0.000
Q1	4.030	0.931	0.004	7.314	3.921	4.138	–0.216	0.000	3.939	4.106	–0.167	0.000
Q2	4.070	0.967	0.004	7.954	3.973	4.165	–0.192	0.000	4.070	4.367	–0.296	0.000
LNTAB	17.739	2.020	10.631	23.245	16.161	19.290	–3.129	0.000	16.089	19.114	–3.026	0.000
ROA	0.048	0.175	–2.786	2.931	0.035	0.060	–0.025	0.009	0.032	0.061	–0.029	0.003
FATA	0.351	0.311	0.000	1.000	0.422	0.281	0.142	0.000	0.432	0.284	0.148	0.000
SDROA	0.095	0.275	0.001	3.478	0.671	0.123	0.548	0.000	0.118	0.076	0.042	0.000
DIFD	–0.024	0.203	–0.565	0.752	–0.033	–0.016	–0.018	0.114	–0.049	–0.004	–0.045	0.000
IPSA	0.121	0.326	0.000	1.000	0.030	0.210	–0.180	0.000	0.031	0.195	–0.164	0.000
LNAGE	3.415	0.910	0.000	5.056	3.301	3.528	–0.227	0.000	3.343	3.476	–0.133	0.008
AGE	42.784	32.316	1.000	157.000	38.667	46.833	–8.166	0.000	39.909	45.180	–5.271	0.003
Observations	1,792				889	903			815	977		

Notes: SD = standard deviation; Min = minimum; Max = maximum; Diff = difference. These variables are bank debt, which is estimated with two alternative measures (*BDTD* and *BDTA*); growth opportunities (*Q1* and *Q2*); company size (*LNTAB*); return on assets (*ROA*); tangibility of assets (*FATA*); insolvency risk (*SDROA*); distance from the firm debt position to the industry average leverage (*DIFD*); and the firm's reputation (*IPSA*, *LNAGE*, and *AGE*). The table includes mean difference tests for the same variables between small and large firms. The classification between small and large firms is based on (1) the mean of the firm's size relative to the mean size for the whole sample, and (2) the mean of the firm's size relative to the mean size of the firm's industrial sector.

Table 3. The effect of growth opportunities on bank debt concentration

Variables	Coefficient standard error	Coefficient standard error	Coefficient standard error	Coefficient standard error	Coefficient standard error	Coefficient standard error
Intercept	0.2281*** 0.1171	0.4157*** 0.0969	0.3895*** 0.0971	0.3866*** 0.0950	0.5170*** 0.0819	0.5469*** 0.0908
$BDTD_{t-1}$	0.3653*** 0.0009	0.3499*** 0.0011	0.3699*** 0.0012	0.4303*** 0.0017	0.4296*** 0.0017	0.4286*** 0.0017
Q1	–0.0991*** 0.0001	–0.0876*** 0.0001	–0.0776*** 0.0001			
$Q1^2$	0.0136*** 0.0000	0.0132*** 0.0000	0.0129*** 0.0000			
Q2				–0.0573*** 0.0001	–0.0576*** 0.0001	–0.0684*** 0.0001
$Q2^2$				0.0078*** 0.0000	0.0085*** 0.0000	0.0094*** 0.0000
LNTAB	–0.0031*** 0.0009	–0.0092*** 0.0009	–0.0144*** 0.0009	–0.0132*** 0.0018	–0.0221*** 0.0017	–0.0253*** 0.0019
ROA	–0.0811*** 0.0022	–0.0664*** 0.0024	–0.0805*** 0.0022	–0.1086*** 0.0038	–0.1066*** 0.0039	–0.1171*** 0.0045
FATA	0.1939*** 0.0058	0.1992*** 0.0077	0.1799*** 0.0072	0.1509*** 0.0123	0.1560*** 0.0121	0.1371*** 0.0136
SDROA	0.3473*** 0.0392	0.3145*** 0.0367	0.2628*** 0.0358	0.4011*** 0.0458	0.3134*** 0.0422	0.2960*** 0.0432
DIFD	0.2752*** 0.0053	0.3445*** 0.0055	0.2709*** 0.0052	0.2315*** 0.0069	0.2339*** 0.0071	0.1859*** 0.0080
IPSA	–0.2271*** 0.0673			–0.2022*** 0.0694		

(continues)

Table 3. Continued

Variables	Coefficient standard error	Coefficient standard error	Coefficient standard error	Coefficient standard error	Coefficient standard error	Coefficient standard error
LNAGE		–0.0286*** 0.0022			–0.0029 0.0028	
AGE			–0.0005*** 0.0001			–0.0010*** 0.0001
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Time dummy	Yes	Yes	Yes	Yes	Yes	Yes
AR1	–5.4900***	–5.4400***	–5.4900***	–5.6000***	–5.5900***	–5.6100***
AR2	–0.77	–0.78	–0.77	–72	–0.72	–0.75
Sargan	151.42*** (0.000)	155.95*** (0.000)	154.37*** (0.000)	138.63*** (0.000)	142.26*** (0.000)	139.8*** (0.000)
Hansen	76.39 (0.624)	74.29 (0.688)	76.07 (0.634)	76.23 (0.629)	75.08 (0.664)	77.58 (0.587)
Wald	7.65E+06***	9.49E+06***	8.45E+06***	9.95E+06***	1.26E+07***	1.07E+07***
Observations	1,420	1,420	1,420	1,420	1,420	1,420
H_0: critical value = 0	3.643***	3.318***	3.014***	3.673***	3.388***	3.638***

Notes: Coefficients are estimated from the GMM system estimator of the following model:

$$BDTD_{it} = \beta_0 + \beta_1 Q_{it-1} + \beta_2 Q_{it} + \beta_3 Q_{it}^2 + \beta_4 LNTAB_{it} + \beta_5 ROA_{it} + \beta_6 FATA_{it} + \beta_7 SDROA_{it} + \beta_8 DIFD_{it} + \beta_9 IPSA_{it} + \beta_{10} DUMMYTEMP_t + \beta_{11} DUMMYIND_{it} + \eta_i + \eta_t + \varepsilon_{it}$$

The dependent variable is bank debt over total debt (BDTD). $BDTD_{t-1}$: the one-period lagged variable of BDTD; *Q1* and *Q2*: growth opportunities; *LNTAB*: company size; *ROA*: return on assets; *FATA*: tangibility of assets; *SDROA*: insolvency risk; *DIFD*: distance from the firm debt position to the industry average leverage; *IPSA*, *LNAGE*, and *AGE*: the firm's reputation. We control for industry effect and temporal effect. To deal with the potential endogeneity problems, the instruments selected are based in lagged values of right hand variables of the estimated model. AR1 and AR2 are the test of first-order and second-order serial autocorrelation of the residuals, respectively. The Sargan and Hansen contrasts represent the test of overidentifying restrictions, asymptotically distributed as a χ^2. We show the Wald tests of significance of the explanatory variables. We test the hypothesis that the critical values are zero through the nonlinear combinations test. Standard errors are given below each coefficient. *** Significance at < 1 percent; ** significance at < 5 percent; * significance at < 10 percent.

Since the growth opportunities are typically unobservable by outsiders, a common practice is to rely on proxy variables. To minimize the bias caused by the measurement of growth opportunities in our results, we use two alternative proxies. *Q1* considers the replacement value of total assets; *Q2* considers the market value of the firm. These two are the usual approximations of the Tobin's *Q* and may be used for robustness purposes as well.[7]

In all cases, for the whole sample in Table 3, we observe that there is a nonmonotonic U-shaped relationship between the growth opportunities and the level of bank debt for the two proxies of the growth opportunity set, *Q1* and *Q2*. The relationship is negative for low levels of growth opportunities and positive once the critical level of growth opportunities is reached. The critical level of growth opportunities is recorded for each regression at the bottom of the table. The applied test on nonlinear restriction verifies that the estimated values are statistically different from zero. In fact, bank debt level is minimized when the average levels of growth opportunities are 3.33 and 3.57 for *Q1* and *Q2*, respectively.

This finding is consistent with the hypothesis about the effect of growth opportunities on bank debt. The negative relationship between growth options and bank debt is supported by the hold-up problem. Private creditors can take advantage of their informational monopoly and extract rents from the company and its future investment projects. To avoid the excessive power that banks can exert over the firm, managers will reduce the level of bank debt as growth opportunities increase. This argument comes from the side of the demand for external funds.

Once the critical point of growth opportunities is achieved (bottom line of Table 3), a positive relationship is observed between this variable and bank debt. This finding is supported by the following arguments: First, the asymmetries of information generated by the growth opportunities might cause more severe agency problems. As a result, shareholders might use bank debt to reduce the informational gap of growth opportunities, and, by doing so, to more efficiently monitor the firm. Second, the strategic advantage of growth opportunities might be jeopardized if the information is shared with a large number of creditors, as occurs in the case of public debt. However, if these growth opportunities are financed through one or a few bank creditors, the strategic advantage is kept inside the firm and not disseminated to outsiders. In this case, the firm will prefer to finance the growth options with private debt and not spread the strategic information into the capital markets. Finally, when information about growth opportunities is asymmetrically distributed, managers might opportunistically use the free cash flow to undertake negative NPV projects. To avoid these agency problems, shareholders will persuade their managers to issue more debt, particularly bank debt. By doing this, shareholders force managers to afford periodic payments of both interest and principal, which reduces the free cash flow available for opportunistic behavior. Therefore, this last argument also supports a positive relationship between growth opportunities and bank debt.

Regarding the other variables included in the estimations, we observe that the larger the firm (*LNTAB*), the lower the proportion of bank debt. This finding is consistent with the additional sources of funds available for large firms. It has been widely recognized that large firms can take advantage of the economies of scale issuing corporate bonds, for instance, or additional equity in national markets and abroad (e.g., American Depository Receipts [ADRs]). In less integrated capital markets, smaller firms are usually constrained to issuing bank debt because they cannot take advantage of the economies of scale when issuing, for instance, public debt.

Concerning the firm's profitability (*ROA*), we observe a negative and statistically significant relationship with private debt. This finding is supported by the pecking order theory, which argues that firms will first use internally generated funds and will issue debt only when this internal source of funds is exhausted. More profitable firms are able to generate higher inflows, and therefore, their dependence on external sources of funds, such as banks, is lower.

The tangibility of assets, which might be used also as a proxy for collateral (FATA), shows a positive relationship with bank debt. Firms with a higher degree of information asymmetry (lower collateral in the form of fixed assets) will be less likely to issue debt privately. The idea that if a firm pledges collateral when taking a bank loan, the price at which it obtains credit will be lower and thus will improve debt capacity is widely accepted in the extensive empirical literature (Benmelech and Bergman 2009). Our findings seem to support this idea.

In Table 3, we observe a positive relationship between *SDROA* and bank debt. The explanation for this result is that in the Chilean corporate sector, shareholders are trying to transfer the insolvency risk to private creditors. This agency conflict is materialized in the asset substitution problem. We might say that high-risk companies are interested in sources of funds that can mitigate inefficient firm liquidation (De Andrés et al. 2005). Therefore, firms with more volatile returns will prefer bank debt rather than public or market debt in case they need to avoid liquidation.

The results show that the higher the difference between the firm's leverage and its industry's leverage (*DIFD*), the higher the proportion of bank debt. When the firm's leverage is further from its industry's leverage, bank debt is the resource used by the firm to finance its operations.

Finally, we have used a number of measures for a firm's reputation (*IPSA*, *LNAGE*, *AGE*). *IPSA* is a dummy variable that indicates whether the company is one of the twenty most-traded firms in the Chilean corporate sector; *AGE* and *LNAGE* are the number of years since the founding of the company and its logarithmic transformation, respectively. The three proxies for reputation are negatively related with bank debt (note that *AGE* and *LNAGE* are not significant in the third and fifth regressions in Table 3, respectively). In general, we can suggest that there is a negative impact of a firm's reputation on private debt. There seems to be a substitution effect of private debt by public debt when reputation improves. In other words, firms use their reputation to access capital markets other than bank debt (Ang et al. 1982).

The Effect of Firm Size on the Relationship Between Growth Opportunities and Concentration of Bank Debt

The most interesting result of this study is that we find empirical evidence that the behavior of small and large companies is not the same when they choose their financial resources. Although in both cases, the relationship between growth opportunities and bank debt is first negative and then positive, the critical level is reached sooner for small firms than for large firms. This finding is consistent for the two proxies of growth opportunities used in this paper (see Table 4 for *Q1* and *Q2*). In other words, the minimum of bank debt is obtained at lower levels of growth opportunities for smaller firms than for larger firms. To determine what the critical values are, we use the dummy variable for firm size (*DUMMYSIZE*, which takes value 1 when the size of the firm is greater than the mean value for *LNTAB* and 0 otherwise), which is interacted with the different

Table 4. The effect of firm size on the relationship between growth opportunities and bank debt

Variables	Coefficient standard error	Coefficient standard error	Coefficient standard error	Coefficient standard error	Coefficient standard error	Coefficient standard error
Intercept	0.1491***	0.2077***	0.1257***	0.1478***	0.1900***	0.1214***
	0.0020	0.0051	0.0035	0.0041	0.0053	0.0038
$BDTD_{t-1}$	0.5459***	0.5657***	0.5703***	0.5862***	0.6079***	0.6107***
	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005
Q1	–0.3717***	–0.2305***	–0.1554***			
	0.0000	0.0000	0.0000			
*Q1 * DUMMYSIZE*	0.1057***	0.1442***	0.1302***			
	0.0150	0.0168	0.0164			
*Q1 + Q1 * DUMMYSIZE*	–0.2660***	–0.0862**	–0.0252**			
	0.0056	0.0168	0.0164			
$Q1^2$	0.0519***	0.0380***	0.0292***			
	0.0000	0.0000	0.0000			
$Q1^2$ * *DUMMYSIZE*	–0.0187***	–0.0257***	–0.0256***			
	0.0036	0.0046	0.0045			
$Q1^2 + Q1^2$ * *DUMMYSIZE*	0.0333***	0.0123***	0.0037***			
	0.0015	0.0046	0.0045			
Q2				–0.1184***	–0.0930***	–0.0966***
				0.0000	0.0000	0.0000
*Q2 * DUMMYSIZE*				0.0893	0.0868	0.0567
				0.0145	0.0113	0.0128
*Q2 + Q2 * DUMMYSIZE*				–0.0291**	–0.0062*	–0.0399**
				0.0145	0.0113	0.0128

(continues)

Table 4. Continued

Variables	Coefficient standard error	Coefficient standard error	Coefficient standard error	Coefficient standard error	Coefficient standard error	Coefficient standard error
$Q2^2$				0.0194***	0.0176***	0.0167***
				0.0000	0.0000	0.0000
$Q2^2$ * *DUMMYSIZE*				–0.0161	–0.0168**	–0.0119
				0.0034	0.0027	0.0030
$Q2^2 + Q2^2$ * *DUMMYSIZE*				0.0033**	0.0008*	0.0047**
				0.0034	0.0027	0.0030
DUMMYSIZE	–0.0242	–0.0595***	–0.0550***	–0.0041	–0.0389***	–0.0376***
	0.0156	0.0149	0.0145	0.0157	0.0112	0.0130
ROA	–0.0129***	–0.0068***	–0.0064***	–0.0229***	–0.0171***	–0.0164***
	0.0010	0.0012	0.0011	0.0014	0.0013	0.0012
FATA	0.1373***	0.1740***	0.1832***	0.1071***	0.1559***	0.1663***
	0.0021	0.0033	0.0030	0.0040	0.0036	0.0034
SDROA	0.0629***	0.0795***	0.0656***	0.0535***	0.0557***	0.0484***
	0.0073	0.0102	0.0095	0.0144	0.0128	0.0125
DIFD	0.1751***	0.1454***	0.1162***	0.2028***	0.1653***	0.1432***
	0.0018	0.0018	0.0018	0.0020	0.0018	0.0018
IPSA	–0.2465***			–0.2343***		
	0.0437			0.0472		
LNAGE		–0.0277***			–0.0236***	
		0.0006			0.0009	
AGE			–0.0004***			–0.0004***
			0.0000			0.0000

Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Time dummy	Yes	Yes	Yes	Yes	Yes	Yes
AR1	–5.7500***	–5.7600***	–5.7600***	–5.7400***	–5.7600***	–5.7600***
AR2	–0.46	–0.47	–0.47	–0.49	–0.48	–0.48
Sargan (*p*-value)	232.63*** (0.000)	236.11*** (0.000)	236.02*** (0.000)	220.38*** (0.000)	222.63*** (0.000)	222.78*** (0.000)
Hansen (*p*-value)	123.57 (0.805)	123.26 (0.811)	127.69 (0.725)	122.27 (0.828)	125.82 (0.763)	130.65 (0.659)
Wald	1.04E+08***	8.92E+07***	9.26E+07***	1.08E+08***	9.93E+07***	1.01E+08***
Observations	1,420	1,420	1,420	1,420	1,420	1,420
Large firms' critical value	3.997	3.501	3.444	4.477	4.072	4.211
Small firms' critical value	3.579	3.031	2.659	3.058	2.647	2.897
H_0: difference critical value = 0	0.418***	0.470***	0.786***	1.418***	1.425***	1.314***

Notes: Coefficients are estimated from the GMM system estimator of the following model:

$$BDTD_{it} = \beta_0 + \beta_1 BDTD_{it-1} + \beta_2 Q_{it} + \beta_3 Q_{it} * DUMMYSIZE_{it} + \beta_4 Q_{it}^2 + \beta_5 Q_{it}^2 * DUMMYSIZE_{it} + \beta_6 DUMMYSIZE_{it} + \beta_7 ROA_{it} + \beta_8 FATA_{it} + \beta_9 Z_{it} + \beta_{10} DIFD_{it} + \beta_{11} IPSA_{it} + \beta_{12} DUMMYTEMP_t + \beta_{13} DUMMYIND_{it} + \eta_i + \eta_t + \varepsilon_{it}$$

The dependent variable is bank debt over total debt (BDTD). $BDTD_{t-1}$: the one-period lagged variable of BDTD; *Q1* and *Q2*: growth opportunities; *LNTAB*: company size; *ROA*: return on assets; *FATA*: tangibility of assets; *SDROA*: insolvency risk; *DIFD*: distance from the firm debt position to the industry average leverage; *IPSA*, *LNAGE*, and *AGE*: the firm's reputation; *DUMMYSIZE*: a dummy variable for the size of the company). We control for industry effect and temporal effect. To deal with the potential endogeneity problems, the instruments selected are based in lagged values of right hand variables of the estimated model. AR1 and AR2 are the test of first-order and second-order serial autocorrelation of the residuals, respectively. The Sargan and Hansen test represents test of overidentifying restrictions, asymptotically distributed as a χ^2. We show the Wald tests of significance of the explanatory variables. We test the hypothesis that the critical values for large and small firms are the same throughout the nonlinear restrictions test. Standard errors are given below each coefficient. *** Significance at < 1 percent; ** significance at < 5 percent; * significance at < 10 percent.

proxies for growth opportunities and their respective squared transformations (*Q1*, $Q1^2$, *Q2*, and $Q2^2$). We run nonlinear restriction tests to validate the addition of *Q1* and *Q1 * DUMMYSIZE* and their squared transformations. The same tests apply for the *Q2* variable. The results in Table 4 correspond to the estimations of Equation (2). We also test the null hypothesis, which states that the critical values for large and small firms are the same. The hypothesis is rejected in all the regressions shown in Table 4. Thus, we can accept the assertion that the critical value for small firms is achieved at statistically lower levels of growth opportunities than for large firms. Once this threshold is passed, the growth opportunities tend to be financed with higher levels of bank debt.

It is important to note that the divergence in the critical values of growth opportunities between large and small firms is due to inherent characteristics of the Chilean marketplace. There are several arguments supporting this idea. First, in general, larger firms have easier access to public debt markets than do smaller firms. This is because larger firms have relatively lower bankruptcy costs, can diversify more easily than smaller firms, and can take advantage of the economies of scale of the fixed flotation costs of public debt more easily than small firms (Saona 2011). Therefore, small firms must issue bank debt sooner than large companies to be able to finance their growth opportunity set. Second, according to Hackbarth (2009), in an institutional environment with weak protection of investors, small firms are forced to accept "take it or leave it" loans because the supply of alternative funds for this kind of firm is much less than for large and mature companies. Consequently, small firms must issue bank debt to finance their growth opportunities in situations where a large firm might still be able to issue financial securities other than private debt. Third, according to the institutional setting, Beck et al. (2008) argue that bank-based financial systems, such as the Chilean system, foster disproportionately the development of small firms relative to large firms. Therefore, the most important source of funds to finance the future growth opportunities of small firms is private borrowing.

Considering the other explanatory variables included in the specification of our model, we observe some other interesting findings. For instance, the *DUMMYSIZE* variable is in accordance with *LNTAB* (from Table 3), showing a negative and statistically significant coefficient. In other words, larger firms issue less bank debt than do small firms for financing their operations. The descriptive statistic also shows that small firms have about 48.7 percent of their debt issued through private banks while large firms have only 39.7 percent of their total debt issued with banks (see Table 2).

The other explanatory variables as well as the control variables show roughly the same results as those displayed in Table 3.

As a robustness test, we run the regressions of Equation (2) one more time, but in this case, we use *DUMMYSIZEIND* as a dummy variable for the firm size (Table 5). This dummy takes into consideration the average size of the firm relative to its industrial sector. This variable takes the value 1 when the size of the company is larger than the average firm size in its own industrial sector and 0 otherwise. The results are consistent with those shown in Table 4. Therefore, we can conclude that the major findings are robust regardless of the criteria used to differentiate between large and small companies. Once again, the nonlinear U-shaped relationship between the set of growth opportunities and private debt is observed. The bottom line of Table 5 shows that the critical values for small firms are different from those for large firms, supporting the idea that small firms seek private loans sooner than do large firms as growth opportunities increase.

Table 5. The effect of firm size on the relationship between growth opportunities and bank debt: robustness test

Variables	Coefficient standard error	Coefficient standard error	Coefficient standard error	Coefficient standard error	Coefficient standard error	Coefficient standard error
Intercept	0.2020***	0.1201***	0.1308***	0.1669***	0.1071***	0.1222***
	0.0016	0.0087	0.0061	0.0046	0.0087	0.0065
$BDTD_{t-1}$	0.4565***	0.4574***	0.4594***	0.4901***	0.4870***	0.4902***
	0.0005	0.0007	0.0007	0.0011	0.0012	0.0012
Q1	–0.5067***	–0.6493***	–0.7553***			
	0.0016	0.0017	0.0002			
*Q1 * DUMMYSIZEIND*	0.0335**	0.0294*	0.0367***			
	0.0123	0.0100	0.0109			
*Q1 + Q1 * DUMMY-SIZEIND*	–0.4732**	–0.6200**	–0.7186**			
	0.0154	0.0034	0.0152			
$Q1^2$	0.1136**	0.1064***	0.1302***			
	0.0000	0.0000	0.0000			
*$Q1^2$ * DUMMYSIZEIND*	–0.0318***	–0.0320***	–0.0387*			
	0.0041	0.0033	0.0037			
*Q1 + $Q1^2$ * DUMMY-SIZEIND*	0.0818**	0.0744***	0.0915**			
	0.0046	0.0056	0.0033			
Q2				–0.0991***	–0.0949***	–0.0865***
				0.0027	0.0037	0.0039
*Q2 * DUMMYSIZEIND*				0.0745**	0.0315**	0.0600*
				0.0152	0.0152	0.0108
*Q2 + Q2 * DUMMY-SIZEIND*				–0.0246**	–0.0634**	–0.0265**
				0.0175	0.0175	0.0124

(continues)

Table 5. Continued

Variables	Coefficient standard error	Coefficient standard error	Coefficient standard error	Coefficient standard error	Coefficient standard error	Coefficient standard error
Q2²				0.0191***	0.0272***	0.0277***
				0.0000	0.0000	0.0000
*Q2² * DUMMYSIZEIND*				–0.0170*	–0.0185*	–0.0200***
				0.0048	0.0048	0.0035
*Q2² + Q2² * DUMMY-SIZEIND*				0.0021**	0.0087**	0.0078**
				0.0033	0.0040	0.0030
DUMMYSIZEIND	–0.0390***	–0.0327***	–0.0380***	0.0057**	0.0068*	–0.0123
	0.0091	0.0075	0.0080	0.0121	0.0122	0.0085
ROA	–0.0226***	–0.0260***	–0.0240***	–0.0173***	–0.0200***	–0.0184***
	0.0006	0.0012	0.0011	0.0010	0.0012	0.0013
FATA	0.0855***	0.1065***	0.1025***	0.1160***	0.1243***	0.1191***
	0.0019	0.0055	0.0057	0.0043	0.0056	0.0061
SDROA	0.0322**	0.0075	0.0333***	0.0370*	0.0319**	0.0099
	0.0057	0.0103	0.0097	0.0156	0.0159	0.0168
DIFD	0.2210***	0.2006***	0.1496***	0.1733***	0.1675***	0.1385***
	0.0023	0.0025	0.0024	0.0024	0.0034	0.0034
IPSA	–0.0399**			–0.0400**		
	0.0166			0.0196		
LNAGE		–0.0193*			0.0163	
		0.0012			0.0016	
AGE			0.0014			0.0011
			0.0000			0.0001
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Time dummy	Yes	Yes	Yes	Yes	Yes	Yes

AR1	–5.7400***	–5.7500***	–5.7700***	–5.7500***	–5.7600***	–5.7800***
AR2	–0.51	–0.49	–0.49	–0.59	–0.58	–0.56
Sargan (*p*-value)	245.09*** (0.000)	244.62*** (0.000)	239.65*** (0.000)	238.17*** (0.000)	238.08*** (0.000)	235.01*** (0.000)
Hansen (*p*-value)	138.45 (0.449)	130.79 (0.633)	123.25 (0.794)	131.52 (0.616)	131.23 (0.623)	126.63 (0.727)
Wald	1.85E+08***	2.09E+08***	2.27E+08***	2.02E+08***	2.16E+08***	2.41E+08***
Observations	1,420	1,420	1,420	1,420	1,420	1,420
Large firms' critical value	2.892	4.165	3.926	5.741	3.648	1.708
Small firms' critical value	2.230	3.051	2.901	2.593	1.744	1.560
H_0: Difference critical value = 0	0.662*	1.114***	1.025***	3.148***	1.904***	0.148

Notes: Coefficients are estimated from the GMM system estimator of the following model:

$$BDTD_{it} = \beta_0 + \beta_1 BDTD_{it-1} + \beta_2 Q_{it} + \beta_3 Q_{it} * DUMMYSIZEIND_{it} + \beta_4 Q_{it}^2 + \beta_5 Q_{it}^2 * DUMMYSIZEIND_{it} + \beta_6 DUMMYSIZEIND_{it} + \beta_7 ROA_{it} + \beta_8 FATA_{it} + \beta_9 SDROA + \beta_{10} DIFD_{it} + \beta_{11} IPSA_{it} + \beta_{12} DUMMYTEMP_t + \beta_{13} DUMMYIND_{it} + \eta_i + \eta_t + \varepsilon_{it}$$

The dependent variable is bank debt over total debt (BDTD). $BDTD_{t-1}$: the one-period lagged variable of BDTD; *Q1* and *Q2*: growth opportunities; *LNTAB*: company size; *ROA*: return on assets; *FATA*: tangibility of assets; *SDROA*: insolvency risk; *DIFD*: distance from the firm debt position to the industry average leverage; *IPSA*, *LNAGE*, and *AGE*: the firm's reputation; *DUMMYSIZEIND*: a dummy variable for the size of the company. We control for industry effect and temporal effect. To deal with the potential endogeneity problems, the instruments selected are based in lagged values of right hand variables of the estimated model. AR1 and AR2 are the test of first-order and second-order serial autocorrelation of the residuals, respectively. The Sargan and Hansen test represents test of overidentifying restrictions, asymptotically distributed as a χ^2. We show the Wald tests of significance of the explanatory variables. We test the hypothesis that the critical values for large and small firms are the same throughout the nonlinear restrictions test. Standard errors are given below each coefficient. *** Significance at < 1 percent; ** significance at < 5 percent; * significance at < 10 percent.

Conclusions and Final Remarks

This paper goes one step beyond Jara et al.'s (2012) article, analyzing the extent to which firm size determines the nonmonotonic relationship between future growth opportunities and bank debt in the Chilean corporate sector. We use the agency theory and the asymmetries of information theory to ascertain how firm size determines the capital structure and particularly the bank debt decision.

The empirical analysis shows that the U-shaped relationship between growth opportunities and bank debt is justified by the rent consumption done by banks, which use their informative advantage (hold-up problem) to create the negative relationship; the positive relation between growth options and private debt is justified by the overinvestment problems and by the disciplining role of debt in reducing the agency problems of debt. Moreover, we conclude that this nonmonotonic relationship has a different pattern depending on the size of the firm. Consistently, smaller firms resort to bank debt sooner than do larger firms as the growth opportunities set rises. Several factors support this finding: the higher transaction costs of public debt for smaller firms relative to larger firms, the lower availability of external sources other than private debt for small companies, the lesser reputation and credit quality of smaller companies, the higher insolvency risk for smaller firms, among others.

The results obtained in this paper suggest possible future changes in economic policies in order to develop the Chilean financial and corporate sectors. Policy makers should address future regulation in order to facilitate more diversified capital structures in Chilean firms, particularly in small firms. This will make access to external sources of funds other than bank debt easier, which will lower the cost of capital and prevent firms from rejecting profitable projects due to financial constraints.

Finally, a future research line derived from this paper might be addressed by a cross-country analysis, including other emerging economies, to study the extent to which country-level factors determine bank debt decisions.

Notes

1. This political process was known as "popular capitalism," wherein several important firms were part of a privatization process. Some examples of these firms are LAN (now LATAM), Copec, Inforsa (now CMPC), Banco de Chile, Banco Santiago (now Banco Santander de Chile), CTC (now Telefónica Chile), Enersis, IANSA, and SOQUIMICH (Sociedad Química y Minera), among others.

2. Some of the main differences related to the country of legal origin are creditors' rights (Levine 1998), quality of accounting standards and the accounting process in general, ownership structure (Himmelberg et al. 1999), market development, and per capita income (La Porta et al. 2000). In general, common-law systems provide greater investor protection than do French civil-law systems.

3. The ability of public lenders to anticipate the agency problems of debt is related to the degree of financial market development. According to the empirical literature about financial development, the Chilean capital markets are quite developed compared with capital markets of the United States and the most developed markets in South America (Beck et al. 2008; Beck et al. 2000; La Porta et al. 1998; World Economic Forum 2009, 2012). Although Chilean financial market development scores have experienced significant improvements (World Economic Forum 2009, 2012), recent financial scandals such as *La Polar* case cast doubts on the ability of Chile's public lenders to anticipate properly the agency problems of debt.

4. Berger and Udell (2002) provide evidence that size reflects reputation in financing choices.

5. Accounts payable, debt with related parties, and other non–interest-bearing debt in our records represent about 18.4 percent of total assets. In their aggregate statistics, Lefort and Walker (2000b)

report that these types of debt represent about one-third of total assets. Lefort and Walker's statistics are substantially higher than ours because their time span covers the decade of the 1990s, when high capital markets and economic growth were observed in Chile. The use of internal capital markets and a sharp increase in accounts payable occurred as a response to the pronounced growth and some financial restrictions originated by the Asian financial crisis in the middle of the 1990s.

6. For further detail about the differences and advantages of the GMM system estimator relative to the first-difference GMM estimator, see Roodman (2009).

7. The theoretical definition of Tobin's *Q* coefficient is the ratio of market value of the firm to replacement cost of assets. Chung and Pruitt (1994) have compared the values of *Q* obtained by the method of Lindenberg and Ross (1981) with the market-to-book ratio, finding that at least 96.6 percent of the variability of Tobin's *Q* is explained by the market-to-book ratio. A similar correlation coefficient (96 percent) is found by Perfect and Wiles (1994). The findings reported by Adam and Goyal (2008) show that, on a relative scale, the market-to-book assets ratio has the highest information content with respect to investment opportunities.

8. To avoid losing a few observations for year 1997, $SDROA_{it}$ is computed from year t to year $t - 4$.

References

Adam, T., and V. Goyal. 2008. "The Investment Opportunity Set and Its Proxy Variables." *Journal of Financial Research* 31, no. 1: 41–63.

Akisik, O. 2013. "Accounting Regulation, Financial Development, and Economic Growth." *Emerging Markets Finance & Trade* 49, no. 1: 33–67.

Albring, S.M.; I.K. Khurana; A. Nejadmalayeri; and R. Pereira. 2011. "Managerial Compensation and the Debt Placement Decision." *Journal of Corporate Finance* 17, no. 5: 1445–1456.

Alonso-Borrego, C., and M. Arellano. 1999. "Symmetrically Normalized Instrumental-Variable Estimation Using Panel Data." *Journal of Business & Economic Statistics* 17, no. 1: 36–49.

Andritzky, J. 2003. "Leverage, Industries, and Countries: Evidence from Seven Countries." Working paper, Universität St. Gallen, November 17.

Ang, J.; J. Chua; and J. McConnell. 1982. "The Administrative Costs of Corporate Bankruptcy: A Note." *Journal of Finance* 37, no. 1: 219–226.

Arellano, M. 2002. "Sargan's Instrumental Variables Estimation and the Generalized Method of Moments." *Journal of Business & Economic Statistics* 20, no. 4: 450–459.

Arellano, M., and S. Bond. 1991. "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *Review of Economic Studies* 58, no. 2: 277–297.

———. 1998. "Dynamic Panel Data Estimation Using DPD98 for GAUSS: A Guide for Users." Working paper, Institute of Financial Studies, London.

Azofra, V.; P. Saona; and E. Vallelado. 2004. "Estructura de propiedad y oportunidades de crecimiento como determinantes del endeudamiento de las empresas chilenas" [Ownership Structure and Growth Opportunities as Determinants of Debt in Chilean Companies]. *Revista ABANTE* 7, no. 2: 105–145.

Barclay M.; C. Smith; and R. Watts. 1995. "The Determinants of Corporate Leverage and Dividend Policies." *Journal of Applied Corporate Finance* 7, no. 4: 4–19.

Beck T.; A. Demirgüç-Kunt; L. Laeven; and R. Levine. 2008. "Finance, Firm Size, and Growth." *Journal of Money, Credit and Banking* 40, no. 7: 1379–1405.

Beck T.; A. Demirgüç-Kunt; and R. Levine. 2000. "A New Database on the Structure and Development of the Financial Sector." *World Bank Economic Review* 14, no. 3: 597–605.

Benmelech E., and N.K. Bergman. 2009. "Collateral Pricing." *Journal of Financial Economics* 91, no. 3: 339–360.

Berger, A., and G. Udell. 2002. "Small Business Credit Availability and Relationship Lending: The Importance of Bank Organizational Structure." *Economic Journal* 112, no. 477: F32–F53.

Bessler, W.; W. Drobetz; and M. Grüninger. 2011. "Information Asymmetry and Financing Decisions." *International Review of Finance* 11, no. 1: 123–154.

Bevan, A.A., and J. Danbolt. 2004. "Testing for Inconsistencies in the Estimation of UK Capital Structure Determinants." *Applied Financial Economics* 14, no. 1: 55–66.

Bharath, S.T.; P. Pasquariello; and G. Wu. 2009. "Does Asymmetric Information Drive Capital Structure Decisions?" *Review of Financial Studies* 22, no. 8: 3211–3243.
Billett, M.; T. King; and D. Mauer. 2007. "Growth Opportunities and the Choice of Leverage, Debt Maturity, and Covenants." *Journal of Finance* 62, no. 2: 697–730.
Blundell, R., and S. Bond. 1998. "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models." *Journal of Econometrics* 87, no. 1: 115–143.
Bond, S. 2002. "Dynamic Panel Data Models: A Guide to Micro Data Methods and Practice." *Portuguese Economic Journal* 1, no. 2: 141–162.
Boyd, J.H., and E.C. Prescott. 1986. "Financial Intermediary-Coalitions." *Journal of Economic Theory* 38, no. 2: 211–232.
Chung, K., and S. Pruitt. 1994. "A Simple Approximation of Tobin's *q*." *Financial Management* 23, no. 3: 70–74.
Črnigoj, M; and D. Mramor. 2009. "Determinants of Capital Structure in Emerging European Economies: Evidence from Slovenian Firms." *Emerging Markets Finance & Trade* 45, no. 1: 72–89.
Danbolt, J.; I. Hirst; and E. Jones. 2002. "Measuring Growth Opportunities." *Applied Financial Economics* 12, no. 3: 203–212.
Dang, V.A. 2011. "Leverage, Debt Maturity and Firm Investment: An Empirical Analysis." *Journal of Business Finance & Accounting* 38, nos. 1–2: 225–258.
De Andrés, P.; F. López; J. Rodríguez; and E. Vallelado. 2005. "Determinants of Bank Debt in a Continental Financial System: Evidence from Spanish Companies." *Financial Review* 40, no. 3: 305–333.
Demirgüç-Kunt, A., and V. Maksimovic. 1998. "Law, Finance, and Firm Growth." *Journal of Finance* 53, no. 6: 2107–2137.
———. 2002. "Funding Growth in Bank-Based and Market-Based Financial Systems: Evidence from Firm-Level Data." *Journal of Financial Economics* 65, no. 3: 337–363.
Denis, D., and V. Mihov. 2003. "The Choice Among Bank Debt, Non-Bank Private Debt and Public Debt: Evidence from New Corporate Borrowings." *Journal of Financial Economics* 70, no. 1: 3–28.
Dennis, S.A., and I.G. Sharpe. 2005. "Firm Size Dependence in the Determinants of Bank Term Loan Maturity." *Journal of Business Finance & Accounting* 32, nos. 1–2: 31–64.
Detragiache, E.; P. Garella; and L. Guiso. 2000. "Multiple Versus Single Banking Relationships: Theory and Evidence." *Journal of Finance* 55, no. 3: 1133–1161.
Diamond, D. 1991. "Debt Maturity Structure and Liquidity Risk." *Quarterly Journal of Economics* 106, no. 3: 709–737.
Djankov, S.; O. Hart; C. McLiesh; and A. Shleifer. 2008. "Debt Enforcement Around the World." *Journal of Political Economy* 116, no. 6: 1105–1149.
Elsas, R., and D. Florysiak. 2011. "Heterogeneity in the Speed of Adjustment Toward Target Leverage." *International Review of Finance* 11, no. 2: 181–211.
Fama, E. 1985. "What's Different About Banks?" *Journal of Monetary Economics* 15, no. 1: 29–39.
Fernández, V. 2005. "Monetary Policy and the Banking Sector in Chile." *Emerging Markets Finance & Trade* 41, no. 3: 5–36.
———. 2006. "Emerging Derivatives Markets: The Case of Chile." *Emerging Markets Finance & Trade* 42, no. 2: 63–92.
Fitzpatrick, J., and J.P. Ogden. 2011. "The Detection and Dynamics of Financial Distress." *International Review of Finance* 11, no. 1: 87–121.
Flannery, M., and K. Rangan. 2006. "Partial Adjustment Toward Target Capital Structures." *Journal of Financial Economics* 79, no. 3: 469–506.
Gallego, F., and N. Loayza. 2000. "Financial Structure in Chile: Macroeconomic Developments and Microeconomic Effects." *Economía Chilena* 3, no. 2: 5–30.
Gander, J.P. 2012. "Firm Debt Structure, Firm Size and Risk Volatility in U.S. Industrial Firms." *Applied Financial Economics* 22, no. 5: 387–393.
García-Teruel, P.J.; P. Martínez-Solano; and J.P. Sánchez-Ballesta. 2009. "Accruals Quality and Corporate Cash Holdings." *Accounting & Finance* 49, no. 1: 95–115.
Gaud, P.; E. Jani; M. Hoesli; and A. Bender. 2005. "The Capital Structure of Swiss Companies: An Empirical Analysis Using Dynamic Panel Data." *European Financial Management* 11, no. 1: 51–69.

Ghosh, S. 2007. "Bank Debt Use and Firm Size: Indian Evidence." *Small Business Economics* 29, nos. 1–2: 15–23.
Goyal, V.; K. Lehn; and S. Racic. 2002. "Growth Opportunities and Corporate Debt Policy: The Case of the U.S. Defense Industry." *Journal of Financial Economics* 64, no. 1: 35–59.
Hachette, D. 2001. "Privatizaciones: Reforma estructural pero inconclusa" [Privatization: Structural Reform but Unfinished]. In *La transformación económica de Chile* [The Economic Transformation of Chile], ed. F. Larraín and R. Vergara, pp. 111–153. Santiago: Center for Public Studies.
Hackbarth, D. 2009. "Determinants of Corporate Borrowing: A Behavioral Perspective." *Journal of Corporate Finance* 15, no. 4: 389–411.
Hansen, L.; J. Heaton; and A. Yaron. 1996. "Finite-Sample Properties of Some Alternative GMM Estimators." *Journal of Business & Economic Statistics* 14, no. 3: 262–280.
Hernández, L., and E. Walker. 1993. "Estructura de financiamiento corporativo en Chile (1978–1990): Evidencia a partir de datos contables" [Corporate Financing Structure in Chile (1978–1990): Evidence from Accounting Data]. *Estudios Públicos* 51: 87–156.
Himmelberg, C.; R. Hubbard; and D. Palia. 1999. "Understanding the Determinants of Managerial Ownership and the Link Between Ownership and Performance." *Journal of Financial Economics* 53, no. 3: 353–384.
Hooks, L.M. 2003. "The Impact of Firm Size on Bank Debt Use." *Review of Financial Economics* 12, no. 2: 173–189.
Houston, J., and C. James. 1996. "Bank Information Monopolies and the Mix of Private and Public Debt Claims." *Journal of Finance* 51, no. 5: 1863–1889.
Hovakimian, A. 2006. "Are Observed Capital Structures Determined by Equity Market Timing?" *Journal of Financial and Quantitative Analysis* 41, no. 1: 221–243.
Iglesias, A. 2000. "Pension Reform and Corporate Governance: Impact in Chile." *Revista ABANTE* 3, 1: 109–141.
James, C. 1987. "Some Evidence on the Uniqueness of Bank Loans." *Journal of Financial Economics* 19, no. 2: 217–236.
James, C., and D.C. Smith. 2000. "Are Banks Still Special? New Evidence on Their Role in the Corporate Capital-Raising Process." *Journal of Applied Corporate Finance* 13, no. 1: 52–63.
Jara, M.; M. Moreno; and P. Saona. 2012. "Non-Linear Relationship Between Growth Opportunities and Bank Debt: A Panel Data Analysis of Chilean Firms." *Academia, Revista Latinoamericana de Administración* 50, no. 1: 44–65.
Jara, M., and S. Sánchez. 2012. "Factores determinantes del endeudamiento bancario en la empresa no financiera chilena" [Determinants of Bank Debt in Chilean Nonfinancial Companies]. *El Trimestre Económico* 79, no. 313: 53–84.
Jensen, M. 1986. "Agency Cost of Free Cash Flow, Corporate Finance, and Takeovers." *American Economic Review* 72, no. 6: 323–329.
Johnson, S. 1997. "An Empirical Analysis of the Determinants of Corporate Debt Ownership Structure." *Journal of Financial and Quantitative Analysis* 32, no. 1: 47–69.
———. 1998. "The Effect of Bank Debt on Optimal Capital Structure." *Financial Management* 27, no. 1: 47–56.
Kale, J.R., and C. Meneghetti. 2011. "The Choice Between Public and Private Debt: A Survey." *IIMB Management Review* 23, no. 1: 5–14.
Krishnaswami, S., and V. Subramaniam. 1999. "Information Asymmetry, Valuation, and the Corporate Spin-Off Decision." *Journal of Financial Economics* 53, no. 1: 73–112.
La Porta, R.; F. Lopez-de-Silanes; and A. Shleifer. 1999. "Corporate Ownership Around the World." *Journal of Finance* 54, no. 2: 471–517.
La Porta, R.; F. Lopez-de-Silanes; A. Shleifer; and R. Vishny. 1998. "Law and Finance." *Journal of Political Economy* 106, no. 6: 1113–1155.
———. 2000. "Investor Protection and Corporate Governance." *Journal of Financial Economics* 58, nos. 1–2: 3–27.
Larraín, F., and R. Vergara. 2000. "Un cuarto de siglo de reformas fiscales" [A Quarter Century of Tax Reforms]. In *La transformación económica de Chile* [The Economic Transformation of Chile], ed. F. Larraín and R. Vergara, pp. 70–107. Santiago: Center for Public Studies.
Lefort, F., and R. González. 2008. "Hacia un mejor gobierno corporativo en Chile" [Toward Better Corporate Governance in Chile]. *Revista ABANTE* 11, no. 1: 17–37.

Lefort, F., and E. Walker. 2000a. "The Effects of Economic and Political Shocks on Corporate Governance Systems in Chile." *Revista ABANTE* 2, no. 2: 183–206.
———. 2000b. "Ownership and Capital Structure of Chilean Conglomerates: Facts and Hypotheses for Governance." *Revista ABANTE* 3, no. 1: 3–27.
Levine, R. 1998. "The Legal Environment, Banks, and Long-Run Economic Growth." *Journal of Money, Credit and Banking* 30, no. 3: 596–613.
Lindenberg, E., and S. Ross. 1981. "Tobin's *q* Ratio and Industrial Organization." *Journal of Business* 54, no. 1: 1–32.
López, F. 2005. "Debt Ownership Structure and Legal System: An International Analysis." *Applied Economics* 37, no. 3: 355–365.
López, F., and V.L. Crisóstomo. 2010. "Do Leverage, Dividend Payout, and Ownership Concentration Influence Firms' Value Creation? An Analysis of Brazilian Firms." *Emerging Markets Finance & Trade* 46, no. 3: 80–94.
López, F., and J. Rodríguez. 2008. "Capital Structure and Institutional Setting: A Decompositional and International Analysis." *Applied Economics* 40, no. 14: 1851–1864.
López, J., and F. Sogorb. 2008. "Testing Trade-Off and Pecking Order Theories Financing SMEs." *Small Business Economics* 31, no. 2: 117–136.
Meneghetti, C. 2012. "Managerial Incentives and the Choice Between Public and Bank Debt." *Journal of Corporate Finance* 18, no. 1: 65–91.
Modigliani, F., and M. Miller. 1958. "The Cost of Capital, Corporation Finance and the Theory of Investment." *American Economic Review* 48, no. 3: 261–297.
Moon, D., and K. Tandon. 2007. "The Influence of Growth Opportunities on the Relationship Between Equity Ownership and Leverage." *Review of Quantitative Finance and Accounting* 29: 339–351.
Morgado, A., and J. Pindado. 2003. "The Underinvestment and Overinvestment Hypotheses: An Analysis Using Panel Data." *European Financial Management* 9, no. 2: 163–177.
Myers, S. 1984. "The Capital Structure Puzzle." *Journal of Finance* 39, no. 3: 575–593.
Myers, S., and N. Majluf. 1984. "Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have." *Journal of Financial Economics* 13, no. 2: 187–221.
Nakamura, L. 1993. "Commercial Bank Information: Implications for the Structure of Banking." In *Structural Change in Banking*, ed. M. Klausner and L. White, pp. 131–160. Homewood, IL: Business One/Irwin.
Ozkan, A., and N. Ozkan. 2004. "Corporate Cash Holdings: An Empirical Investigation of UK Companies." *Journal of Banking & Finance* 28, no. 9: 2103–2134.
Perfect, S., and K. Wiles. 1994. "Alternative Constructions of Tobin's q: An Empirical Comparison." *Journal of Empirical Finance* 1, nos. 3–4: 313–341.
Raddatz, C. 2006. "Liquidity Needs and Vulnerability to Financial Underdevelopment." *Journal of Financial Economics* 80, no. 3: 677–722.
Rajan, R. 1992. "Insiders and Outsiders: The Choice Between Informed and Arm's-Length Debt." *Journal of Finance* 47, no. 4: 1367–1400.
Rajan, R., and A. Winton. 1995. "Covenants and Collateral as Incentives to Monitor." *Journal of Finance* 50, no. 4: 1113–1146.
Rajan, R., and L. Zingales. 1995. "What Do We Know About Capital Structure? Some Evidence from International Data." *Journal of Finance* 50, no. 5: 1421–1460.
Roodman, D. 2009. "How to Do xtabond2: An Introduction to 'Difference' and 'System' GMM in Stata." *Stata Journal* 9, no. 1: 86–136.
Saona, P. 2010. "Growth Opportunities as Determinants of the Partial Adjustment Toward Target Debt Ratio: Evidence for the Chilean Case." *International Review of Business and Finance* 2, no. 2: 179–207.
———. 2011. *Endeudamiento bajo la teoría de agencia y el enfoque "Law & Finance": Un estudio para Chile y España* [Endebtedness Under the Agency Theory and the "Law & Finance" Approach: A Study of Chile and Spain]. Saarbrücken: Editorial Académica Española.
Saona, P., and E. Vallelado. 2005. "Ownership Structure and Growth Opportunities as Determinants of Bank Debt: Evidence from Chilean Companies." *Management Research: The Journal of the Iberoamerican Academy of Management* 3, no. 2: 119–134.

———. 2010. "Is the Use of Bank Debt as a Governance Mechanism Conditioned by the Financial System? The Cases of Chile and Spain." *Applied Economics* 42, no. 13: 1709–1726.
———. 2012. "Firms' Capital Structure Under Akerlof's Separating Equilibrium." *Spanish Journal of Finance and Accounting* 41, no. 156: 471–495.
Serrasqueiro, Z., and P.M. Nunes. 2010. "Non-Linear Relationships Between Growth Opportunities and Debt: Evidence from Quoted Portuguese Companies." *Journal of Business Research* 63, no. 8: 870–878.
Titman, S., and R. Wessels. 1988. "The Determinants of Capital Structure Choice." *Journal of Finance* 43, no. 1: 1–19.
Wald, J. 1999. "Capital Structure with Dividend Restrictions." *Journal of Corporate Finance* 5, no. 2: 193–208.
World Economic Forum. 2009. *The Global Competitiveness Report 2008–2009.* Geneva.
———. 2012. *The Global Competitiveness Report 2012–2013.* Geneva.
Yosha, O. 1995. "Information Disclosure Costs and the Choice of Financing Source." *Journal of Financial Intermediation* 4, no. 1: 3–20.

Appendix

Dependent Variable

The dependent variable is bank debt, which is measured by private borrowing as a fraction of total financial liabilities. In private borrowing we have included the short- and long-term debt issued with banks and private institutions only. Following Azofra et al. (2004), in the denominator we consider only the financial liabilities, excluding accounts payable, debt with related parties, and other non-interest-bearing debt:

$$BDTD = BD_{it}/TD_{it},$$

where BD_{it} is the bank debt for firm i at year t and TD_{it} is total financial liabilities for firm i at year t excluding accounts payable, debt with related parties, and other non-interest-bearing debt.

$$BDTA = BD_{it}/TA_{it},$$

where TA_{it}, is the total assets for firm i at year t.

Independent Variables

Growth Opportunities

$$Q1 = MkCptz_{it} + TD_{it}/K_{it},$$

where $MkCptz_{it}$ is market capitalization computed as the product of the year-end closing price per share and the number of shares outstanding per firm; K_{it} is the replacement value of assets of firm i at year t, which is estimated in Perfect and Wiles (1994) as follows:

$$K_{it} = RNP_{it} + RINV_{it} + (TA_{it} - BNP_{it} - BINV_{it}),$$

where RNP_{it} is the replacement cost of net property, plant, and equipment (net fixed assets); $RINV_{it}$ is the replacement value of inventories; BNP_{it} is the book value of net fixed assets; and $BINV_{it}$ is the book value of inventories.

$$RNP_{it} = RNP_{it-1}[(1 + \phi_t)/(1 + \delta_{it})] + I_{it}$$

for $t > t_0$, where t_0 is the first year observed for a given company in this study. $RNP_{it_0} = BNP_{it_0}$. ϕ_t is the growth of capital goods prices in year t, which is defined by the gross domestic product (GDP) deflator. In other words, $\phi_t = (NomGDP_t/RealGDP_t)100$, where $NomGDP_t$ is the nominal GDP and $RealGDP_t$ is the real GDP, both reported by the National Institute of Statistics of Chile. δ_{it} is the real depreciation rate, defined as $\delta_{it} = Dep_{it}/BNP_{it}$, where Dep_{it} is the book depreciation.

I_{it} is the new investment in property, plant, and equipment (capital expenditure), which is defined as $I_{it} = BNP_{it} - BNP_{it-1} + Dep_{it}$.

$$RINV_{it} = BINV_{it}\left[\frac{2WPI_t}{WPI_t + WPI_{t-1}}\right],$$

where WPI_t is the wholesale price index reported by the National Institute of Statistics of Chile. This estimation for the replacement value of inventories assumes that the inventory accounting method is the average cost. For this method, the value of inventories reported at time t is approximately equal to the average of the prices at $t - 1$ and t.

$$Q2 = MkCptz_{it} + TD_{it}/TA_{it}.$$

Size of the Firm

$$LNTAB_{it} = \ln(TA_{it})$$

$$DUMMYSIZE_i = \begin{cases} 1 \text{ for large firms } (LNTAB_{it} > 17.739) \\ 0 \text{ for small firms } (LNTAB_{it} \le 17.739) \end{cases}$$

$$DUMMYSIZEIND_i = \begin{cases} 1 \text{ for large firms } (LNTAB_{it} > \text{mean of } LNTAB_{it} \text{ by industrial sector}) \\ 0 \text{ for small firms } (LNTAB_{it} \le \text{mean of } LNTAB_{it} \text{ by industrial sector}) \end{cases}$$

Profitability

$$ROA_{it} = EBT_{it}/TA_{it},$$

where EBT_{it} is earnings before taxes.

Collateral

$$FATA_{it} = BNP_{it}/TA_{it}.$$

Insolvency Risk

$SDROA_{it}$ is the standard deviation of ROA_{it} from year t to year $t - 6$.[8]

Distance from the Firm's Debt Position to the Industry Average Leverage

$$DIFD_{it} = LEV_{it} - LEVI_{indt},$$

where $LEV_{it} = TD_{it}/TA_{it}$ and $LEVI_{indt} = TD_{indt}/TA_{indt}$, TD_{indt} and TA_{indt} are the total debt and total assets for firms belonging to the *ind* industrial sector at the year t, respectively.

Reputation

$$IPSA_{it} = \begin{cases} 1 \text{ if the firm belongs to the ISPA index} \\ 0 \text{ if the firm does not belong to the IPSA index} \end{cases}$$

where *IPSA* is the Indice de Precio Selectivo de Acciones, which is a market index that considers the forty most-traded companies in the Santiago Stock Exchange.

$$LNAGE_{it} = \ln(AGE_{it}),$$

where AGE_{it} is the number of years since the founding of the company.