Block ownership by families and financial constraints for investment in Brazil

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Abstract

Some micro and macroeconomic market characteristics seem to be able to interfere on investment and financing policies. That may cause the existence of a link between investment and financing decisions. At micro economic level, the conflict of interests predicted by the theory of the firm and information asymmetry is possibly one of the leading sources of such interdependence of investment process and financial decisions. Financial constraint is characterized as a situation in which the firm may be unable to obtain external financing due to its high cost, mainly as consequence of asymmetric information about firms' projects, being the firm directed to rely on internally generated funds to undertake their investment projects. Prior relevant literature has found evidence of the existence of financial constraints in different markets. Possible factors that may affect the intensity of financial constraints have also been the focus of more recent studies. In this context, firm characteristics like firm size, access to bond market or dividend policy have been considered as able to signal financial constraints. More recently, ownership structure has been taken into consideration as another firm characteristic able to interfere in the intensity of financial constraints. Evidence has been found for ownership concentration, and, more recently, the identity of block ownership have also been taken into account and investigated as able to moderate firm access to external finance. The purpose of this work is investigating whether family ownership in Brazilian firm mitigates financial constraints. Some arguments in favor of family ownership for value creation have been presented in previous literature. Such rationale, mainly related to the alignment of interests between ownership and control and long term perspective associated to family reputation, can be also considered in financing context. The estimation of dynamic investment models for a panel dataset of 289 nonfinancial Brazilian companies for the time period 1995-2006, in a total of 2,808 firm year observations, has shown that, in fact, Brazilian firm faces financial constraints. Most important, family firms have shown to face easier access to external financing in Brazil. Models estimated are based on the Euler equation for optimal capital accumulation in the presence of convex adjustment costs, and controls for previous investment, output fluctuations, cash flow and leverage. Evidence has been found that firms with relevant family ownership have their investment process not dependent on internally generated funds in contrast to the high dependence of the other firms. The attention given to financial constraints by academics from an international perspective and the growing visibility of Brazil as an important emerging market justifies this research. The additional evidence of financial constraints in Brazil signals for the need of more economic changes to strengthen financial markets and mitigate such situations. Most important, evidence has been found that family ownership is a firm characteristic that moderates financial constraints in Brazil.

Keywords: investment, financial constraints, family ownership, Brazil.

1 Introduction

Contrary to the predictions for a perfect market, some micro and macroeconomic aspects seem to be able to interfere in investment policy leading to a connection between investment and financing decisions (Stein, 2003). At micro economic level, the conflict of interests predicted by the theory of the firm is possibly one of the leading sources of such imperfections. Information asymmetry is considered the main market imperfection responsible for the link between investment and financial decisions (Greenwald, Stiglitz, & Weiss, 1984; Hubbard, 1990, 1998). Literature has also found that macro economic conditions, institutional and legal framework may also play a role on it (Gertler & Gilchrist, 1994; La Porta, López-de-Silanes, Shleifer, & Vishny, 1997, 2000).

Financial constraint is a circumstance in which the firm may be unable to obtain external financing due to its high cost and so, may have to rely on internally generated funds. Such circumstance is mainly consequence of asymmetric information about firms' projects (Akerlof, 1970; Greenwald & Stiglitz, 1990). Literature on financial constraints have considered that the high cost of external finance forces firms to use internal funds to undertake their investment projects, and, this way, the investment-cash flow sensitivity has been interpreted as an important signal of financial constraints (Allayannis & Mozumdar, 2004; Alti, 2003; Bond & Meghir, 1994a; Bond, Harhoff, & Van Reenen, 2003b; Fazzari, Hubbard, & Petersen, 1988; Schiantarelli, 1996).

Some firm characteristics have been analyzed as able to moderate the intensity of financial constraints. This is the case, for example, of firm size, access to bond market, or dividend policy (Schiantarelli, 1996; Whited, 1992). More recently, ownership structure and corporate governance have also been seen as able to affect financial constraints. A new stream of research has focused on the identity of dominant large shareholders and its possible effects on the intensity of financial constraints and, on investment and financing policy besides on firm value (Allen & Phillips, 2000; Filatotchev, Isachenkova, & Mickiewicz, 2007; Goergen & Renneboog, 2001).

The still limited research about financial constraints in developing markets, mainly about possible factors that influence it, is an important motivation to the completion of this study that is focused in Brazil, an emerging market that has received increased international attention recently. Brazil has faced some structural changes since the 1990s, relative to the financial system as well as to its macroeconomics, with the purpose of increasing efficiency and productivity of the financial sector with positive effects to firm investment financing (Baer & Coes, 2001; Studart, 2000). Among such reforms, the privatization process, mainly motivated by market forces but also by political decision, has caused ownership restructuring with the reduction of state participation in ownership and a growing proportion of block ownership held by other corporations as well as the emergence of foreign and institutional investors as important owners. Family ownership, a tradition in markets characterized by high ownership concentration, has not changed that much during this process. Family firms have been the center of research with different nuances, like risk aversion, corporate governance, disclosure, value creation and performance (Ali, Chenb, & Radhakrishnana, 2007; Anderson, Duru, & Reeb, 2010; Maury, 2006; Morck & Yeung, 2004; Villalonga & Amit, 2006). Investment and financing policies of family firms have also received some attention in more recent literature (Anderson, Duru, & Reeb, 2010). Is family ownership able to influence firm's investment and financing policies? That's a question still unanswered, mainly in developing economies where such research is very

limited like in Brazil. As far as we are concerned, no research has been dedicated to look for possible links between the financial constraints and block ownership by families in Brazil.

The purpose of this work is to search whether block ownership by families is able to moderate the intensity of financial constraints in Brazil. In a first step, we search for evidence of the existence of financial constraints in the Brazilian market according to some previous evidence. Then, we search whether block ownership by families affects the intensity of financial constraints.

In fact, we find evidence indicating the existence of financial constraints in Brazil, in accordance with previous evidence. More important our findings show that family firms face less financial constraints in the Brazilian market.

In order to achieve its objective, this paper is organized as follows. To support the proposed hypotheses, some aspects of the Brazilian recent scenery are commented together with ownership structure aspects in Brazil. Then, work method, sample and econometric models are detailed. Results are discussed after, and, a final section contains conclusions of the work.

2 Brazilian market, financial constraints, block ownership by families, and hypotheses

2.1 Brazilian market and financial constraints

Some structural macroeconomic reforms started in the 1990s might be seen as important to the recent advances in Brazilian financial services (Baer & Coes, 2001; Mattos, Cassuce, & Campos, 2007; Studart, 2000). Among these reforms are the privatization process, the external liberalization, and the monetary stabilization with the Plan "Real" which has allowed a dramatic decrease in inflation levels and monetary stability since 1995. Perotti & Pieter (2001) have found that the privatization process in Brazil occurred in parallel with the advance in capital markets. Studart (2000) has found that the volume of transactions in the stock exchange Brazilian market has grown 741% in the period 1992-1997. A positive effect of financial liberalization to the allocation of investment funds has been verified for Brazil and other developing countries by Galindo & Schiantarelli (2002) and Galindo, Schiantarelli, & Weiss (2007).

Despite these recent advances, Brazil still has characteristics that favor the high cost of external financing and the existence of financial constraints. For example, protection of minority shareholders and creditors are still inadequate, and Brazilian market also registers high ownership concentration (López Iturriaga & Crisóstomo, 2010) and also high benefits of control (Dyck & Zingales, 2004). Additionally, institutional framework and capital market advances have not been enough to decrease the high interest rates in Brazil, compared to European, North American, or even other undeveloped countries (Marques & Fochezatto, 2007; Oliveira & Carvalho, 2007; Omar, 2008).

In sum, although the recent changes achieved in Brazil represent advances for the enforcement of capital markets and for economic stabilization, low protection of minority shareholders and creditors, as well as high interest rates, may still limit Brazilian firms' access to external funds. The asymmetry of information between firm and market, inherent to any market, also contributes to the emergence of financial constraints situations in Brazil.

International evidence, mainly centered in developed economies, has shown that the use of internal funds as a consequence of financial constraints is a reality in developed economies like USA, Germany, UK, Canada and Spain (Audretsch & Elston, 2002; Bond, Harhoff, & Van Reenen, 2003a; Fazzari, Hubbard, & Petersen, 1988; Maestro, De Miguel, & Pindado, 2007; Rizov, 2004; Whited & Wu, 2006). Evidence has also been found in transition economies such as, the Czech Republic (Lízal & Svejnar, 2002), Bulgaria (Rizov, 2004), and Russia (Perotti & Gelfer, 2001).

As a whole, although the positive changes in the Brazilian market since the mid-1990s the country still has conditions that favor the rise of constraints to external sources of financing. These characteristics, taken together with the inherent information asymmetry problem and international evidence of financial constraints, give support to proposition of the hypothesis that Brazilian firm is financially constrained, in the direction of previous results (Moreira & Puga, 2000; Terra, 2003).

Hypothesis 1: Market imperfections affect firm investment process in a way that firms face financial constraints for investment. As a result, it is expected that firm investment policy is affected by firm financial situation in Brazil.

2.2 Ownership structure and financial constraints

Limited research about possible effects of ownership structure on investment and financing policies has been pointed in the literature and seen as relevant topic to be explored (Hennessy, Levy, & Whited, 2007; Schiantarelli & Sembenelli, 2000). Evidence has been found in favor of a positive effect of ownership concentration in easing firm's access to external finance (Chirinko & Schaller, 1995; Goergen & Renneboog, 2001; Schaller, 1993). According to Chirinko & Schaller (1995), financiers consider high ownership concentrated firms as less probable to misrepresent the quality of investment projects what is important in the bond and debt market.

The identity of the main large block shareholders, and its possible effects on investment and financing policy, has received some attention of research. In a work comparing investment intensity averages, Holderness & Sheehan (1988) find signals that the identity of blockholders seem to have effect on investment policy since they detected a light higher spending on advertising for firms that had a physical person as the majority shareholder. Goergen & Renneboog (2001) present two theoretical arguments to investigate whether ownership concentration in hands of certain shareholder categories is able to reduce financial constraints. First, whether it is possible to reduce overinvestment through a better managerial supervision, what would minimize the possibility of internal funds squandering. Second, information asymmetry between management and shareholders is reduced to the extent that such blockholder receives more and well-timed information, what might also influence positively the relation with external creditors. Evidence has been found that foreign ownership, for example, is a factor that lessens difficulties to access external finance for investment (Galindo & Schiantarelli, 2002; Harrison & McMillan, 2003; Mickiewicz, Bishop, & Varblane, 2004).

2.2.1 Families as blockholders

Recent works have shown that family controlled companies are very common in distinct markets around the world (Anderson, Mansi, & Reeb, 2003; Claessens, Djankov, & Lang, 2000; Faccio & Lang, 2002; La Porta, López-de-Silanes, Shleifer, & Vishny, 1999). In USA, Anderson, Mansi, & Reeb (2003) find that family firms represent one third of S&P

500 index and that control in hands of families last 78 years in average. Faccio & Lang (2002) find that in Continental Europe families are the ultimate controllers in 44.29% of listed firms. The findings of Claessens, Djankov, & Lang (2000) show that in Asia, such numbers are even superior. There, with the exception of Japan with approximately 13% of family firms, family ownership is over 60% in Taiwan, Korea, Singapura and Hong Kong. 13.11% of Brazilian firm-year observations of the sample used in this work have a family as the main voting shareholder.

Research about family ownership is more centered on its effects on firm value creation and growth opportunities, being few and inconclusive the results. Villalonga & Amit (2006) find evidence that there is a positive effect on value creation when firm founder is present as the CEO or as the board chairman with a professional CEO. The results of Anderson, Mansi, & Reeb (2003) are in the same direction that family ownership favors value creation. Some arguments in favor of such positive influence may also hold for easing external financing. The closeness between ownership and control indeed seems to be a factor that reduces agency conflicts what is considered as positive by the market. This is associated with the trend to coincide objectives among management and ownership in family controlled firms. They consider that it reflects reduction of agency conflicts between equity and debt claimants. Also arguing in favor of family ownership, Gugler (2003) considers that there is lower managerial discretion in such companies, be it for ownership and control closeness and/or high presence of block owners in management since both contributes to the reduction of information asymmetry with market. The market may also see as positive the fact that family firms a more risk averse than non-family ones as detect by Anderson, Duru, & Reeb (2010). Family shareholders worry about passing the firm onto future generations and that makes family reputation an important concern to them considering wealth maximization and long-term survival (Anderson, Mansi, & Reeb, 2003).

This set of results favorable to family ownership might be associated with positive effects on mitigating financial constraints. The prevalence of family businesses in emerging markets is highlighted by Fan, Wei, & Xu (2011) who calls attention to the need for further research about the relation of family ownership with investment and other corporate policies.

In summary, family ownership is considered to be associated with the reduction of agency conflicts between owners and debt claimants, more active management monitoring. Reputation of family firms is also important for external financing in a market historically characterized for the use of bank financing. This set of arguments leads us to propose the hypothesis that family ownership mitigates financial constraints in Brazil.

> *Hypothesis 2. The presence of large share blocks held by families has a positive effect in mitigating financial constraints faced by the Brazilian firm. Hence, we expect that companies with high ownership in hands of families will have their investment policy less dependent on internal funds.*

3 Models, sample and methodology

3.1 Models

To contrast the proposed hypotheses, we estimate models of investment that take into account the proposals of the pecking order theory. Such models are based on the Euler equation for optimal capital accumulation in the presence of convex adjustment costs

proposed by Bond & Meghir (1994a). The models are based on the first-order condition of a maximization process. Investment is explained by discounted expected future investment, adjustment costs, output fluctuations, cash flow, and leverage, which captures the effects of tax advantages as well as bankruptcy costs of debt and may cause a nonlinear relation between investment and leverage.

In the absence of financial regimes indicative of possible financial constraints, no investment–cash flow sensitivity is expected. In this Euler equation model, investment in capital goods is adjusted for expected changes in input prices and net marginal output while controlling for future profitability on investment spending, cash flow, and leverage. Future unobservable variable values are approximated by instrumental variables. In the estimated models current investment (Inv/K) is the dependent variable as can be seen in equations of the following models (1), (2) and (3).

$$\left(\frac{Inv}{K}\right)_{i,t+1} = \varsigma + \beta_1\left(\frac{Inv}{K}\right)_{i,t} + \beta_2\left(\frac{Inv}{K}\right)^2_{i,t} + \beta_3\left(\frac{CF}{K}\right)_{i,t} + \beta_4\left(\frac{Y}{K}\right)_{i,t} + \beta_5\left(\frac{D}{K}\right)^2_{i,t} + \beta_6 DF_{it}\left(\frac{Inv}{K}\right)_{i,t} + \beta_7 DF_{it}\left(\frac{Inv}{K}\right)^2_{i,t} + \beta_8 DF_{it}\left(\frac{CF}{K}\right)_{i,t} + \beta_9 DF_{it}\left(\frac{Y}{K}\right)_{i,t} + \beta_{10} DF_{it}\left(\frac{D}{K}\right)^2_{i,t} + \delta_{t+1} + \alpha_i + \mu_{i,t+1} \quad (1).$$

$$\left(\frac{Inv}{K}\right)_{i,t+1} = \varsigma + \beta_1\left(\frac{Inv}{K}\right)_{i,t} + \beta_2\left(\frac{Inv}{K}\right)^2_{i,t} + \beta_3\left(\frac{CF}{K}\right)_{i,t} + \beta_4\left(\frac{Y}{K}\right)_{i,t} + \beta_5\left(\frac{D}{K}\right)^2_{i,t} + \beta_6 DM_{it}\left(\frac{Inv}{K}\right)_{i,t} + \beta_7 DM_{it}\left(\frac{Inv}{K}\right)^2_{i,t} + \beta_8 DM_{it}\left(\frac{CF}{K}\right)_{i,t} + \beta_9 DM_{it}\left(\frac{Y}{K}\right)_{i,t} + \beta_{10} DM_{it}\left(\frac{D}{K}\right)^2_{i,t} + \delta_{t+1} + \alpha_i + \mu_{i,t+1} \quad (2).$$

$$\left(\frac{Inv}{K}\right)_{i,t+1} = \varsigma + \beta_1\left(\frac{Inv}{K}\right)_{i,t} + \beta_2\left(\frac{Inv}{K}\right)^2_{i,t} + \beta_3\left(\frac{CF}{K}\right)_{i,t} + \beta_4\left(\frac{Y}{K}\right)_{i,t} + \beta_5\left(\frac{D}{K}\right)^2_{i,t} + \beta_6 HI_{it}\left(\frac{Inv}{K}\right)_{i,t} + \beta_7 HI_{it}\left(\frac{Inv}{K}\right)^2_{i,t} + \beta_8 HI_{it}\left(\frac{CF}{K}\right)_{i,t} + \beta_9 HI_{it}\left(\frac{Y}{K}\right)_{i,t} + \beta_{10} HI_{it}\left(\frac{D}{K}\right)^2_{i,t} + \delta_{t+1} + \alpha_i + \mu_{i,t+1} \quad (3).$$

In the above models, t refers to time period; i refers to firm; δ_{t+1} is the error term related to time-specific effects; α_i is the error term associated with firm-specific effects, which includes unobservable firm-specific characteristics; $\mu_{i,t+1}$ is the random error term; K is the capital stock of the firm; *Inv* refers to investment in capital goods, measured as the increment in K during the current year, adjusted for depreciation ($(1-\lambda)K_t$), where λ is the depreciation rate; *CF* is the cash flow, defined as the sum of net profits and depreciation; Output fluctuation (Y) is proxied by year sales; and D refers to debt.

Models are composed of basic variables: previous investment, adjustment costs, cash flow, output and debt. Additionally, interacted variables are introduced to take into account three aspects. First, in model (1) basic variables are interacted with a dummy variable indicator of possible financial constraints (*DF*) of firm i in year t ($DF_{i,t}$). Model estimation

allows the evaluation of possible differences of each coefficient across the whole sample and the subsample characterized by the presence of financial constraints. Second, in model (2) basic variables are interacted with a dummy variable indicator of the presence of a family as the main shareholder of firm *i* in year *t* ($DM_{i,t}$). Model estimation allows the assessment of possible differences of each coefficient across the whole sample and the subsample characterized by having a family owner as the main shareholder. And, in model (3), basic variables are interacted with a variable that represents the Herfindahl index of ownership concentration in hands of families relative to firm *i* in year *t* ($HI_{i,t}$). Model estimation allows the evaluation of possible differences of coefficients across the whole sample and the subsample that accounts ownership concentration in hands of families.

3.2 Sample

Annual firm data has been collected from Economática database in order to build an unbalanced panel data of 289 nonfinancial firms listed in São Paulo Stock Exchange (BOVESPA) in the period 1995-2006, in a total of 2,808 firm-year observations. Fifteen sectors are represented in the sample, as shown in Table 1. To allow for dynamic analysis, only firms with six or more consecutive years of valid data have been kept in the sample. Some firm-year observation variables have been "winsorized" at the top and bottom 5% levels to remove the impact of outliers, following prior important works (Bhagat, Moyen, & Suh, 2005; Cleary, 1999, 2006).

Table 1:
Number of firms per sector

Sector	Observations		Firms	
	N	%	N	%
Chemicals	231	8.23	22	7.61
Electrical and instrument engineering	104	3.70	11	3.81
Mining, metals and metal goods	430	15.31	44	15.22
Motor vehicles, and transport equipment	234	8.33	23	7.96
Wood, paper and paper products	101	3.60	9	3.11
Communication and media	122	4.34	15	5.19
Textile, clothing, leather and footwear	293	10.43	28	9.69
Petroleum and fuel products	94	3.35	9	3.11
Food, drink and tobacco	209	7.44	21	7.27
Miscellaneous manufacturing industries	209	7.44	20	6.92
Electrical	310	11.04	34	11.76
Building and transportation	152	5.41	17	5.88
Business sector services	117	4.17	12	4.15
Trade and retailing	103	3.67	11	3.81
Miscellaneous services	99	3.53	13	4.50
Total	2,808	100.00	289	100.00

3.3 Empirical method

We estimate the three proposed models using panel data methodology, which allows the treatment of unobservable heterogeneity associated to fixed firm effects. Unobservable specific firm errors can be eliminated from the equation through variable transformation by first differences (Arellano & Bover, 1990). We estimate the models using Arellano & Bond's (1998) system estimator. We use the two-step system estimator (SE) with adjusted standard errors for potential heteroskedasticity proposed by (Blundell & Bond, 1998). This econometric method considers the unobserved effect transforming the variables into first differences and uses the generalized method of moments (GMM) to deal with endogeneity problems. By using the GMM method, we can build instruments for those variables that are

potentially endogenous. Even more, by using the dynamic dimension of panel data, we may check response processes across time and identify how the different determinants included in our integrated signaling model explain investment.

To test model specifications validity, we calculate the Sargan/Hansen test of over identification of restrictions. This test examines the lack of correlation between the instruments and the error term. Given the use of first-difference transformations, we expect some degree of first-order serial correlation, although this correlation does not invalidate results. However, the presence of second-order serial correlation does signal omitted variables. Thus, we use the adjustment for small samples suggested by (Windmeijer, 2005). Since our sample size is not very large, the Windmeijer's proposal improves the robustness of our results and avoids any potential downward bias in the estimated asymptotic standard errors.

3.4 Detecting financial constraints

The assessment of possible financial constraints in the group of firms considered in a financial regime indicative of it is done according to dividend and share issue policies. That has been considered a good strategy to identify different financial regimes indicative of financial constraint situation. These factors have been incorporated in different strategies of financial constraints evaluation in a number of relevant studies in developed economies (Bond & Meghir, 1994a; Bond & Meghir, 1994b; Cleary, 1999; Kaplan & Zingales, 1997; Maestro, De Miguel, & Pindado, 2007; Whited & Wu, 2006) and also in Bulgaria (Rizov, 2004), a transition economy. Three situations of financial regimes that may be indicative of financial constraints for a firm are considered, as depicted in Figure 1. According to Criterion 1, firm *i* is not considered under financial constraint in year *t* ($DF_{i,t} = 0$) if it increases or, at least, maintains the present level of dividend payout, otherwise the firm is considered subject to financial constraints ($DF_{i,t} = 1$), which happens when the firm decreases dividend payout. Being more restrictive, the two other criteria incorporate new share issues. Criterion 2 defines a firm as not financially constrained if it increases or maintains dividend payout and does not issue new stock in the current year. Finally, according to Criterion 3, a firm is not considered under financial constraint if it does not reduce dividend payout and does not issue new stock in the most recent two consecutive periods.

Figure 1:
Categorization criteria of firms in financial constraints

Criteria	Condition to consider a firm out of financial constraints
Criterion 1	Maintain or increment dividend payout in period t
Criterion 2	Maintain or increment dividend payout and does not issue new stock in period t
Criterion 3	Maintain or increment dividend payout and does not issue new stock in periods t and t-1

Ownership concentration in hands of families has been measured using the Herfindahl index as done by Maury & Pajuste (2005). Annual Herfindahl index ($HI_{i,t}$) for each firm is calculated by the sum of squares of the proportions of voting shares owned by families that are among the five largest voting stockholders. Family ownership has been identified from annual information disclosed by firms that contains data about the main shareholders in Brazil. From the names of such shareholders, we have considered families the ones

identified directly by a person name so that we can be sure that these shareholders are actually family members.

The recent bond market growth in Brazil reported by Sanvicente (2002) has motivated us to use two measures of debt (D): total debt, which includes bank and bond debt, and bank debt only. This use of two different measures of debt is also important for sensitivity analysis of the results. This way, each of the three models proposed has been estimated for each measure of debt separately.

4 Results

Table 2 reports summary descriptive statistics of the sample variables. Average investment intensity of 11.58% is a bit inferior to some more advanced markets such as 12.9% in the United States (Chiao, 2002), 13.9% in Germany (Harhoff, 1998), 12.5% in Belgium, and 11.7% in the United Kingdom (Bond, Elston, Mairesse, & Mulkay, 2003). Brazilian firms present an average (CF/K) ratio of 37.56% with an average output ratio (Y/K) of 256%. Total leverage ratio is high at 107.5%, while bank debt is 80% approximately.

Table 2:
Sample descriptive statistics

Variable	Mean	Std. Dev.	Min.	Max.
Inv/K	0.1158	0.5384	–0.8823	3.8316
CF/K	0.3756	1.1013	–1.2839	2.9916
Y/K	2.5607	2.6906	0.0000	8.5936
Debt/K	1.0750	1.3848	0.0000	4.3110
Bank Debt/K	0.8003	0.9552	0.0000	2.9585

The theoretical dynamic adjustment cost model predicts a negative investment–cash flow correlation under the assumption that the firm may raise the required funds to finance its investment projects at a given cost, which corresponds to the absence of financial constraints.

4.1 Brazilian firm is financially constrained

Results in Table 3 refer to model (1) estimated for each of the three criterion considered to classify firms under financial constraints (see Figure 1). Models are estimated using GMM in system. The Sargan/Hansen test of over identifying restriction of the instruments does not rejected the null hypothesis of valid instruments, and, the Arellano-Bond test of second order auto-correlation in the residuals also does not rejected the null hypothesis of the absence of such correlation. Both tests also validate the other models estimated as outlined in the following discussion. In addition, all standard deviations are estimated robust to heteroskedasticity. As previously mentioned, to avoid omission bias, all models incorporate industry dummies (not reported in virtue of space priority).

According to results reported in Table 3 the null hypothesis of perfect markets and the absence of financial constraints may be rejected, giving support to hypothesis 1 that predicts an inter dependence between investment policy and firm financial situation in Brazil. Indeed, investment of firms *a priori* considered as more prone to face financial constraints is more sensitive to liquidity situation. For each of the three criteria used to evaluate whether a firm is under financial constraints a specific subsample of firm-year observations is created. In each subsample, we create interacted variables corresponding to the product between the dummy (indicative of financial constraint situation) in the year and

the basic variables in model (1). The proposition is that estimated coefficients may differ across the whole sample and the subsample considered under financial constraints. We estimate the dynamic model of equation (1) for each of the files associated with each criterion established in Figure 1.

Table 3 reports coefficients of model estimates for the sample with firm-year observations classified according to criteria 1, 2 and 3, in Panels A, B and C, respectively. In accordance with criterion 1, 1,869 firm year observations (66.56% of the sample) are considered under financial constraints (DF = 1). Results for system GMM estimates show that the subsample of firms classified under financial constraints exhibits a significant positive sensitivity of investment to cash flow [DF*(CF/K)] in contrast to the absence of such a correlation in the whole sample (CF/K). According to Criterion 2, the subsample of 2,041 firm year observations (72.69% of the sample), classified as under financial constraints, also presented significant positive investment–cash flow sensitivity compared to the whole group of firms where such sensitivity is absent. Again, a positive and significant sensitivity of investment to cash flow has also been verified for the group of 2,263 firm year observations (80.59% of the whole sample), considered as under financial constraints according to criterion 3. Results are robust to the estimation of model (1) using two distinct measures of debt (total debt and bank debt).

Table 3:
Euler-equation model, three evaluation criteria for financial constraints situations

	Panel A - Criterion 1 1,869 firm year observations (66.56%)		Panel B - Criterion 2 2,041 firm year observations (72.69%)		Panel C - Criterion 3 2,263 firm year observations (80.59%)	
Variables	Total debt	Bank debt	Total debt	Bank debt	Total debt	Bank debt
$(Inv/K)_{i,t}$	0.0775	0.0953	–0.0503	–0.0404	–0.1156	–0.1263
	(0.229)	(0.212)	(0.277)	(0.278)	(0.395)	(0.407)
$(Inv/K)^2_{i,t}$	–0.0398	–0.0465	0.0013	–0.0021	0.0699	0.0678
	(0.082)	(0.075)	(0.098)	(0.098)	(0.156)	(0.163)
$(CF/K)_{i,t}$	–0.0319	–0.0235	–0.032	–0.022	–0.0268	–0.0315
	(0.061)	(0.056)	(0.069)	(0.062)	(0.085)	(0.077)
$(Y/K)_{i,t}$	0.1048***	0.0876***	0.0870***	0.0810***	0.0627**	0.0588**
	(0.029)	(0.028)	(0.028)	(0.028)	(0.029)	(0.029)
$(D/K)^2_{i,t}$	0.0005	0.0018	–0.0040	–0.017	0.0043	0.0168
	(0.011)	(0.024)	(0.011)	(0.027)	(0.016)	(0.031)
$DF_{i,t}$ *$(Inv/K)_{i,t}$	–0.1309	–0.1337	0.0640	0.060	0.0534	0.0728
	(0.308)	(0.296)	(0.363)	(0.369)	(0.456)	(0.470)
$DF_{i,t}$ *$(Inv/K)^2_{i,t}$	0.0463	0.0472	–0.0190	–0.017	–0.0770	–0.0774
	(0.109)	(0.104)	(0.130)	(0.132)	(0.179)	(0.187)
$DF_{i,t}$ *$(CF/K)_{i,t}$	0.1871***	0.1681***	0.1740**	0.1500**	0.2025**	0.2056**
	(0.066)	(0.062)	(0.071)	(0.068)	(0.088)	(0.086)
$DF_{i,t}$ *$(Y/K)_{i,t}$	–0.0374	–0.0278	–0.0190	–0.021	–0.0022	–0.0134
	(0.028)	(0.029)	(0.026)	(0.027)	(0.025)	(0.025)
$DF_{i,t}$ *$(Debt/K)^2_{i,t}$	0.0021	0.0018	0.0080	0.031	–0.0010	–0.0010
	(0.011)	(0.022)	(0.011)	(0.025)	(0.018)	(0.033)
Intercept	1.1290**	0.0484	1.4920*	1.4360*	–0.0596	0.0701
	(0.545)	(0.563)	(0.780)	(0.744)	(0.386)	(0.395)
N. obs.	2,808	2,808	2,808	2,808	2,808	2,808
N. firms	289	289	289	289	289	289
F	2.98	3.26	3.24	3.46	2.58	2.64
p-value	0.0000	0.0000	0.000	0.000	0.0000	0.0000
AR2	0.728	0.687	0.753	0.709	0.83	0.781
Sargan/Hansen	281.99	282.19	281.31	281.51	278.5	279.26
p-value	0.3890	0.3860	0.400	0.397	0.4470	0.4340

Notes: Models estimated by system generalized method of moments (GMM). Estimated coefficients and standard errors robust to heteroscedasticity (in parentheses), concerning model of Equation 1, are presented. Dependent variable

$(Inv/K)_{i,t+1}$. Sargan/Hansen is the test of over identifying restrictions. AR2 is the test of absence of second-order correlation in the residuals. ***, **, and * denote statistical significance of the coefficients at 1, 5, and 10% levels.

4.2 Family ownership mitigates financial constraints

Once detected the presence of financial constraints in the Brazilian market, more important contribution of this work has been the search for possible effects of block ownership by families on financial constraints situations.

To check whether block ownership by families moderates financial constraints we have collected annual ownership data of families among the five main voting shareholders. We have identified the presence of such blockholders as the main voting shareholder and also calculated ownership concentration in their hands.

As shown in Table 4, a family as the main voting shareholder has been verified in 368 firm-year observations (13.11% of the sample). Families also hold important proportions of shares according to the Herfindahl index of 0.0391. As a whole we can see that, effectively, the presence of families in Brazil firm ownership remains relevant.

Table 4:
Ownership in hands of families in the period 1995-2006

	N. observ.	%	N. Firms	%
Family as the main voting shareholder	368	13.11	57	19.72
	Mean	**Std. Dev.**	**Min.**	**Max.**
Ownership concentration in hands of families	0.0391	0.1207	0.0000	1.0000

Models (2) and (3) were estimated to evaluate the effects of family ownership on financial constraints. Model (2) refers to the presence of a family as the main voting shareholder while model (3) accounts for voting ownership concentration in hands of families. Models (2) and (3) were estimated for the sample with interacted variables accounting for the group of firms with high family ownership.

Results are reported in Table 5. For all estimations, the Sargan/Hansen test of over identifying restriction of the instruments has not rejected the null hypothesis of valid instruments, and, the Arellano-Bond test of second order auto-correlation in the residuals also has not rejected the null hypothesis of the absence of such correlation. All standard deviations are estimated robust to heteroskedasticity.

Results for the whole group of firms (Table 5) show that there is a severe difference in the investment-cash flow sensitivity between the whole sample and the subsample characterized by the strong presence of families in ownership. Looking at Panel A, one can see the significant cash flow coefficient (CF/K) for the whole sample in contrast to the absence of such correlation in the subgroup of firms that have a family as the main voting shareholder when the cash flow coefficient turns to negative [DM*(CF/K)]. Similar result can be seen for the subsample characterized by high ownership concentration in hands of families (Panel B). The significant positive coefficient of cash flow for the whole sample contrasts with the negative one for firms with strong presence of families.

Table 5:
Effects of block ownership families on financial constraints

Panel A Family as the main shareholder (Model 2)			Panel B Ownership concentration in hands of families (Model 3)		
Variables	Total debt	Bank debt	Variables	Total debt	Bank debt
$(Inv/K)_{i,t}$	0,0339	0,0594	$(Inv/K)_{i,t}$	0,0138	0,0067
	(0,091)	(0,081)		(0,227)	(0,083)
$(Inv/K)^2_{i,t}$	-0,0530	-0,0647**	$(Inv/K)^2_{i,t}$	-0,0427	-0,0430
	(0,034)	(0,032)		(0,053)	(0,030)
$(CF/K)_{i,t}$	0,1291**	0,1446***	$(CF/K)_{i,t}$	0,1538***	0,1568***
	(0,053)	(0,048)		(0,048)	(0,046)
$(Y/K)_{i,t}$	0,0274	0,0264	$(Y/K)_{i,t}$	0,0273	0,0206
	(0,023)	(0,019)		(0,069)	(0,019)
$(D/K)^2_{i,t}$	0,0000	0,0016	$(D/K)^2_{i,t}$	0,0001	0,0014
	(0,000)	(0,001)		(0,000)	(0,001)
$DM_{i,t}*(Inv/K)_{i,t}$	-0,1508	-0,1207	$HI_{i,t}*(Inv/K)_{i,t}$	-0,3325	-0,3623
	(0,272)	(0,283)		(0,647)	(0,484)
$DM_{i,t}*(Inv/K)^2_{i,t}$	0,1142	0,1123	$HI_{i,t}*(Inv/K)^2_{i,t}$	0,3429	0,3533
	(0,087)	(0,090)		(0,232)	(0,224)
$DM_{i,t}*(CF/K)_{i,t}$	-0,1180	-0,1009	$HI_{i,t}*(CF/K)_{i,t}$	-0,4007*	-0,4142**
	(0,088)	(0,087)		(0,206)	(0,198)
$DM_{i,t}*(Y/K)_{i,t}$	-0,0214	-0,0201	$HI_{i,t}*(Y/K)_{i,t}$	-0,1011	-0,0820
	(0,020)	(0,020)		(0,100)	(0,065)
$DM_{i,t}*(Debt/K)^2_{i,t}$	0,0001	-0,0002	$HI_{i,t}*(Debt/K)^2_{i,t}$	-0,0004	-0,0026
	(0,000)	(0,002)		(0,001)	(0,005)
Intercept	1,2518	1,0461	Intercept	1,9054	1,8139**
	(0,984)	(0,947)		(2,293)	(0,862)
N. obs.	2,808	2,808	N. obs.	2,808	2,808
N. firms	289	289	N. firms	289	289
F	2,92	2,95	*F*	16,67	2,51
p-value	0	0	*p*-value	0	0
AR2	0,885	0,994	AR2	0,933	0,958
Sargan/Hansen	237,54(264)	235,12(264)	Sargan/Hansen	269,95(264)	271,61(264)
p-value	0,878	0,899	*p*-value	0,388	0,361

Notes: Models estimated by system generalized method of moments (GMM). Estimated coefficients and standard errors robust to heteroscedasticity (in parentheses), concerning model of Equation 1, are presented. Dependent variable $(Inv/K)_{i,t+1}$. Sargan/Hansen is the test of over identifying restrictions. AR2 is the test of absence of second-order correlation in the residuals. ***, **, and * denote statistical significance of the coefficients at 1, 5, and 10% levels.

As a whole, our estimation results, which are robust to model specification using two different measures of debt, provide evidence that the Brazilian firm faces financial constraints for investment as depicted by the dependence of investment to firm liquidity situation (Table 3). Estimations of model (1) for samples composed of firm-year observations that account for possible financial constraints situations (see Figure 1), have shown that the subsample of firms classified as under financial constraints indeed have investment policy dependent of internally generated funds.

More relevant is the evidence that block ownership by families mitigates financial constraints problem in Brazilian market. This result has been evidenced through the inferior investment-cash flow sensitivity verified in subsamples characterized by the strong presence of families in ownership (Table 5). Firms characterized by the high ownership presence of families have shown to have their investment policy not dependent on internal funds compared to the others.

5 Conclusions

We find evidence family firms have easier access to external finance in Brazil. Using an unbalanced panel data of 2,808 firm-year observations relative to 289 nonfinancial firms

quoted in São Paulo Stock Exchange in the period 1995-2006 we have found evidence that firms characterized by high presence of families have their investment much less dependent on internal funds in comparison to other firms.

Brazilian firm has been characterized by high ownership concentration with strong family and state presence. In recent years, Brazil's government has implemented a far-reaching policy of capital markets liberalization and reduction of state participation in economy. This has led to changes in Brazilian firm ownership structure with an increase in the ownership of new players, like institutional and external investors. Although these economic changes, family firms are still a reality in Brazil and such firm ownership characteristic may influence some firm policies. As far as we are concerned, no research has looked for the effects of family block ownership on investment and financing polices in Brazil.

Our results show that Brazilian firm is financially constrained. The sensitivity of investment to cash flow has been verified. Investment of firms classified as more prone to face financial constraints according to dividend payout and share issue policies is more dependent on internal funds than investment of other firms.

Most importantly, we find evidence that firms with strong presence of families in firm ownership do not face financial constraints as the whole group of firms. Capital expenditures of firms characterized by the strong presence of families in voting ownership capital do not depend on internally generated funds. This result has been consistent to distinct model estimations, using two distinct measures of debt, total debt and bank debt only. Perhaps the long term perspective of families in ownership, associated with their reputation, should be very favorable for external financing in high concentrated markets like Brazil.

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