Do ultimate owners follow the pecking order theory? Evidence from Brazil

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Abstract

Previous studies that have tested the pecking order theory have been inconclusive. In this paper, we use unique survey results for private Brazilian firms in order to investigate firms' choice of capital structure. We document that ultimate owners of privately owned firms follow the pecking order theory, even in presence of subsidized loans. We also show that whether a firm is debt constrained or unconstrained does not affect this finding.

Keywords: Pecking order; SME; capital structure.

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1. Introduction

There are two main theories regarding capital structure. According to static trade-off theory (Myers, 1984), firms seek an optimal debt ratio; however, according to pecking order theory (Myers, 1984; Myers & Majluf, 1984), firms follow a preferential order when choosing their sources of finance: first, internal resources; then, debt; and last, the issuance of new equity.[1]

Although there is a wide literature that investigate both the static trade-off and pecking order theories, empirical evidence regarding the dominant theory is mixed. Bandyopadhyay and Barua (2016), Chen, Chen, Chen, and Huang (2013), De Jong, Verbeek, and Verwijmeren (2011), Fama and French (2002), Frank and Goyal (2003), Shen (2014), Shyam-Sunder and Myers (1999), and Vanacker and Manigart (2010) present various findings, each of which supports one theory and contradicts the other. Further, Chirinko and Singha (2000) have reservations regarding the empirical tests of these theories.

The foregoing papers, together with a recent paper by Bessler, Drobetz, and Grüninger (2011), serve to confirm that testing the pecking order theory is a question of ongoing interest. In addition, Booth, Aivazian, Demirguc-Kunt, and Maksimovic (2001) show that persistent differences exist across countries in the choice of capital structure, indicating that specific country factors are at work. Further, Lam, Zhang, and Lee (2013) demonstrate that there is a direct link between national culture and capital structure. More recently, Alves and Francisco (2015) evaluate the impact of contemporary financial crises on corporate capital structure. Hence, there is a place to study firms' capital structure policies in various cultural and institutional environments.

Our paper studies privately owned small and medium enterprises (SMEs) in a developing country. This approach contrasts with most of the literature, which deals with publicly listed firms in developed countries (Dong, Loncarski, Horst, & Veld (2012); Leary & Roberts, 2010; Seifert & Gonenc, 2008; Shen, 2014). The Brazilian economy has unique cultural and institutional properties that make our study interesting. In particular, Brazil is beset by high interest rates and difficulties accessing credit. More importantly, most of the long-term credit

[1] For a summary of earlier studies, see Frank and Goyal (2008).

market is in the hands of public banks. Unlike many countries, for most medium- and large-sized firms, long-term credit is cheaper than short-term credit. This should entail a preference for subsidized loans over other sources of financing.

We also contribute to the literature by being the first work, to the best of our knowledge, that directly attempts to provide empirical evidence of the pecking order theory by surveying 159 ultimate owners of privately owned SMEs. Whether or not the ultimate owners (of privately owned SMEs) follow the pecking order theory is important because in most SMEs, decisions about funding sources are taken by the ultimate owners. These firms do not suffer from the agency problems related to the separation between ownership and control.

Our study mostly refers to López-Gracia and Sogorb-Mira (2008), who find that SMEs follow a financing source hierarchy (pecking order); however, López-Gracia and Sogorb-Mira's (2008) results also reveal that greater trust is placed in SMEs that aim to reach target or optimum leverage (in accordance with the static trade-off model). The current study also refers to Bancel and Mittoo (2009), who survey the chief financial officers (CFOs) of public firms in Europe but find scant evidence in favor of the pecking order theory.

We examine the choice of source of capital among the surveyed firms. We consider the choices facing ultimate owners when their firms are debt constrained (firms with more than a 50% debt ratio) and unconstrained (firms with less than a 50% debt ratio). We find, through propensity score matching (PSM), that preferences for retained earnings and other sources of finance do not change with regard to different debt levels. More importantly, SMEs, even those with access to subsidized long-term credit, prefer retained profits to cheap long-term capital in order to fund new investments. We conclude that the pecking order theory holds.

2. The Survey and Descriptive Statistics

Survey data are commonly used in in the corporate finance literature (see, for instance, Brav, Graham, Harvey & Michaely, 2005; Lintner, 1956), even if there are limitations to the conclusions derived from the data (see Campello, Graham, & Harvey 2010). We conduct a survey, from April 26 to May 17, 2013, with ultimate owners of family owned SMEs in Brazil. We reach 527 family owned firms and obtain 159 responses to our 32-question questionnaire. Annual revenue from each of the surveyed firms ranges from roughly USD 8 million to USD 400 million, using the exchange rate at January 2015.

The sample is representative of the spatial distribution of Brazilian firms. Most of the surveyed firms (52.1%) are from the southeast region and only 3% are from the northern, poorer region. These figures may be compared with Relacao Anual de Informacoes Sociais (RAIS) data for 2011. The RAIS data show that in 2010, 51% of SMEs were located in the southeast while only 3.3% were in the northern region.[2]

Table 1 describes the summary statistics of the sample. We present nine characteristics (age, revenue, initial public offering (IPO) likelihood, internal auditing, external auditing, board of directors, growth, capital structure, and ultimate owner gender(s)) that describe the SMEs in our sample. The percentage numbers represent the answers of the ultimate owners of the surveyed family owned SMEs. With regard to half of the sample, ultimate owners estimate that their firms are going to grow more than the market average (47.2%). There is some indication of a lack of professional management because approximately 40% of surveyed firms are neither internally (41.5%) nor externally audited (39.6%). Most of the owners are male, a feature of emerging markets, but 70% of firms already have a board of directors, something that can be attributed more to succession issues (because more than two-thirds of the firms are more than 20 years old) than to a search for professional management. There is an interesting distribution in terms of capital structure, with a normal distribution of debt/equity ratio: 26.4% of firms have less than 10% of debt/equity and 24.5% have more than 90%.[3]

[2] Brazilian financial markets are national. Firms have access to almost the same banks and subsidized loans in every region of the country.

[3] See the full report, in Portuguese, for more statistics. The report can be accessed at http://www.fdc.org.br/professoresepesquisa/publicacoes/Paginas/publicacao-detalhe.aspx?publicacao=18422.

Table 1. Summary statistics of 159 SMEs. Survey data, 2013.

Age		Revenue (USD)		IPO likelihood	
1–3 years	1.3%	<25 million	17.0%	Null	28.3%
5–10 years	6.9%	25–75 million	44.6%	Low	49.1%
10–20 years	24.5%	75–175 million	18.2%	Average	17.6%
>20 years	67.3%	>175 million	20.1%	High	5.0%
Internal auditing		External auditing		Board of directors	
Annually	54.7%	Annually	49.7%	Yes	69.2%
>than annually	3.8%	>than annually	10.7%	No	30.8%
No auditing	41.5%	No auditing	39.6%		
Growth		Capital structure		Ultimate owner gender(s)	
>than market	47.2%	>than market	47.2%	Male	76.7%
Market average	40.9%	Market average	40.9%	Female	5.7%
<market	11.9%	<market	11.9%	Male & female	17.6%

Notes: This table describes the summary statistics of nine different characteristics from the survey data. For each characteristic (age, revenue, IPO likelihood, internal auditing, external auditing, board of directors, growth, capital structure, and ultimate owner gender(s)), we provide the number of firms as a percentage (out of 159) that applies to a specific category (the percentages appear in columns two, four, and six).

Table 2 shows the percentages of firms that consider each alternative source of capital as having high, medium, low, or no relevance. Retained earnings (50%) are by far the option preferred by the SMEs in our sample, followed by subsidized loans (43%) and commercial banks (33%), while other sources of funds such as private equity/venture capital (PE/VC) (4%), debt (3%), and new equity (6%) are relatively irrelevant. This finding implies that firms behave in a way that can be explained by the pecking order theory. The results are even more surprising considering that in Brazil, subsidized loans have a much lower cost of capital than retained earnings. While the risk-free interest rate in Brazil was approximately 11% at the time of the survey, most subsidized lines of credit were approximately 6–7%, and in some cases as low as 2.5%. Long-term credit for SMEs in Brazil is almost exclusively given by public banks. The Brazilian National Economic and Social Development Bank (BNDES is the acronym in Portuguese) is the largest development bank in the world and disbursed, in 2014, almost two times the amount of the World Bank (approximately USD 79 billion and USD 45 billion, respectively) (Torres & Zeidan, 2016). However, SMEs also have access to regional development banks, such as the Northeast Bank (Banco do Nordeste) and the Minas Gerais Development Bank (BDMG in Portuguese). The cost of long-term debt, when firms can access

development banks in Brazil, is much lower than the cost of equity. Even when firms cannot access subsidized loans directly, there are still indirect mechanisms that make access to long-term credit more of an issue for small firms. In our sample, the firms are older than the average small firm. Moreover, most already have some form of access to subsidized loans. Even though the quantity of such loans is not infinite, given the clear disparity between the cost of debt and equity, firms should have a strong preference for them. However, this situation is not reflected in the data. The preferred source of finance for new investments is still retained earnings.

Table 2. Relevance of sources of finance for Brazilian SMEs. Survey data, 2013.

Source relevance	Bonds		PE/VC		Subsidized loans		Commercial banks		New equity		Retained earnings	
None	134	84.3%	112	70.4%	31	19.5%	30	18.9%	68	42.8%	12	7.5%
Low	16	10.1%	27	17.0%	22	13.8%	35	22.0%	59	37.1%	22	13.8%
Medium	4	2.5%	13	8.2%	38	23.9%	41	25.8%	23	14.5%	46	28.9%
High	5	3.1%	7	4.4%	68	42.8%	53	33.3%	9	5.7%	79	49.7%

Notes: This table reports the owners' preferences for raising capital (bonds, PE/VC, subsidized loans, commercial banks, new equity, and retained earnings). "None" means that owners of private SMEs do not expect to use any of these sources to finance their investments. "High" indicates a strong preference for the use of a particular source of funds.

3. Econometric Analysis and Results

The fact that our sample includes firms that prefer retained earnings to subsidized loans does not necessarily mean that the pecking order theory holds because this preference may be caused by debt constraints that force firms to use retained earnings to fund growth. Thus, we have to show that this preference for internal capital is unrelated to firms' debt constraints.

For this purpose, we use a propensity score matching (PSM) approach to compare debt-constrained and unconstrained firms.[4] We conjecture that firms below the optimal debt level should show a preference for higher debt, while constrained firms should pursue deleveraging, with retained earnings playing a larger role in financing.[5] Hence, we compare the preferences for different sources of capital among firms with different debt/equity ratios.

[4] A propensity score relies on the selection of observables. Our implementation via logit also assumes homogeneity, an issue pointed out by Lehrer and Kordas (2013).
[5] We implement PSM in accordance with Campello et al. (2010).

We match debt-constrained and unconstrained firms by size (number of employees) and activity sector. This results in 53 pairs of firms. In order to ensure robustness, we replace each of the matching criteria with a firm's age, geographic location (state), and a binary variable for annual external auditing. The results for the combinations of different criteria follow.

Table 3 shows that constrained and unconstrained firms have the same preferences regarding the sources of finance because most of the coefficients are statistically insignificant. The only significant variable is private equity/venture and capital (PE/VC). This finding is unsurprising because PE/VC implies a greater degree of professional management, which should change the preference for sources of financing toward debt/equity optimization. More importantly, debt-constrained firms should be looking for new equity or have an even stronger preference for retained earnings. IPOs usually follow periods of debt and growth, something that has been known for a while (Pagano, Panetta, & Zingales, 1998). In highly indebted firms, growth is constrained by existing leverage. In this situation, new equity should be an attractive source of financing. However, we find no evidence for this. Regardless of debt constraints, the preference for new equity is strikingly low. Thus, our findings show that ultimate owners follow the pecking order theory regardless of debt constraints.

Table 3. Average treatment effects (matching estimators) for the measurement of financial constraint in terms of sources of financing.

	The difference between constrained and unconstrained firms						
Finance source	Employees/ sector (n=53)	Employees/ firm age (n=49)	Employees/ state (n=46)	Employees/ annual auditing (n=41)	Sector/firm age (n=47)	Sector/state (n=42)	Sector/annual auditing (n=40)
Bonds	-0.012	-0.052	0.031	0.001	-0.008	0.041	-0.012
	(0.567)	(0.492)	(0.783)	(0.454)	(0.536)	(0.418)	(0.567)
PE/VC	-0.651**	-0.131	-0.233**	-0.152	-0.097	-0.353**	-0.116
	(0.327)	(0.235)	(0.147)	(0.177)	(0.225)	(0.166)	(0.270)
Subsidized loans	0.001	0.044	-0.000	0.052	0.000	-0.012	0.001
	(0.100)	(0.089)	(0.077)	(0.073)	(0.081)	(0.070)	(0.067)
Commercial banks	0.058	0.120	-0.061	0.018	0.077	-0.017	0.007
	(0.438)	(0.388)	(0.253)	(0.335)	(0.401)	(0.329)	(0.311)
New equity	0.023	-0.044	0.003	0.051	0.039	-0.001	0.003
	(0.237)	(0.187)	(0.199)	(0.207)	(0.180)	(0.201)	(0.213)
Retained earnings	-0.016	-0.002	0.066	-0.003	0.011	0.000	0.001
	(0.254)	(0.220)	(0.231)	(0.194)	(0.211)	(0.203)	(0.199)

Firms are matched in accordance with Campello et al. (2010) across the number of employees and sectors of activity, resulting in 106 firms in total. We then match firms in accordance with firm age, state, and annual auditing using propensity score matching. Control firms are debt unconstrained (with less than 50% of debt) and treated firms are constrained (with more than 50% of debt). With regard to each case, we estimate the differences in preference for bonds, PE/VC, subsidized loans, commercial banks, new equity, and retained earnings. Standard errors are in parentheses. ** indicates significance at the 5% level.

4. Robustness.

While PSM (Rosenbaum & Rubin, 1983) is the most commonly used matching method, recent research conducted by King and Nielsen (2016) shows that using PSM is suboptimal and that this method can, under certain circumstances, even increase the bias in data. Further, King and Nielsen (2016) show that PSM regularly increases covariate imbalance with respect to other matching methods. Thus, we also implement the Mahalanobis distance matching (MDM) methodology proposed by Abadie and Imbens (2006).

The results in Table 4 are in accordance with the results in Table 3. With regard to half of the combinations, there is a difference in the preference for private equity. Debt-constrained firms have stronger preferences for this source of finance than unconstrained firms. This finding reinforces the pecking order theory, in which the preferred source of financing is retained earnings. Moreover, only restrictions to growth, such as leverage, make ultimate owners look for alternatives. With regard to almost all combinations, there is no difference for debt-constrained and unconstrained firms, with one exception: A difference exists in the preference for subsidized loans for firms with similar characteristics in terms of activity sector and geography ("sector/state" in the table). Moreover, debt-constrained firms have a higher preference for such loans than unconstrained firms. This finding is in accordance with the pecking order theory, but could also be explained by regular corporate finance theory.

Table 4. Mahalanobis distance matching (MDM) for the measurement of financial constraint in terms of sources of financing.

The difference between constrained and unconstrained firms

Finance source	Employees/ sector (n=53)	Employees/ firm age (n=49)	Employees/ state (n=46)	Employees/ annual auditing (n=41)	Sector/firm age (n=47)	Sector/state (n=42)	Sector/annual auditing (n=40)
Bonds	-0.059	-0.082	0.006	-0.076	0.001	0.055	-0.029
	(0.662)	(0.555)	(0.872)	(0.369)	(0.483)	(0.366)	(0.516)
PE/VC	-0.643**	-0.117	-0.256**	-0.061	-0.184	-0.415**	-0.061
	(0.292)	(0.209)	(0.073)	(0.225)	(0.209)	(0.081)	(0.190)
Subsidized loans	-0.037	0.112	-0.021	0.001	0.028	0.050**	0.086
	(0.108)	(0.145)	(0.028)	(0.122)	(0.120)	(0.016)	(0.067)
Commercial banks	-0.006	0.115	-0.135	0.038	0.149	-0.004	-0.033
	(0.488)	(0.432)	(0.198)	(0.358)	(0.395)	(0.289)	(0.371)
New equity	-0.006	-0.118	-0.057	0.029	0.107	-0.097	-0.014
	(0.203)	(0.115)	(0.149)	(0.304)	(0.177)	(0.115)	(0.227)
Retained earnings	-0.040	-0.038	0.158	-0.082	0.074	0.050	0.034
	(0.264)	(0.307)	(0.193)	(0.148)	(0.123)	(0.281)	(0.171)

Notes: Table 4 complements the PSM from Table 3. Firms are matched across the number of employees and sectors of activity, resulting in 106 firms in total. We then match firms in accordance with firm age, state, and annual auditing using Malahanobis distance matching. Control firms are debt unconstrained (with less than 50% debt) and treated firms are constrained (with more than 50% debt). With regard to each case, we estimate the differences in preference for retained earnings, bonds, subsidized loans, commercial banks, new equity, private equity/venture and capital funds (PE/VC), and retained earnings. Standard errors are in parentheses. ** indicates significance at the 5% level.

Additionally, we use a matching sample of almost debt-free firms (with less than 10% debt) compared with leveraged firms (with more than 90% debt) to check if our results hold for firms in the tails of the indebtedness spectrum. As before, we estimate with the regular propensity matching framework and Mahalonobis matching. We present results only for the first of these, given that none of the coefficients in either of the regressions are statistically significant. The results presented in Table 5 show that even at the extreme values of debt constraint, the preferences for sources of funds remain the same. It may be that the lack of statistical significance is due to the number of firms in this subsample. Nevertheless, given that there is a much greater difference between the two groups now (constrained and unconstrained), one would also expect more significant differences as well. Yet there are not. The differences are of the same scale as those of Table 3.

Table 5. Robustness checks for average treatment effects for the measurement of financial constraint in terms of sources of Financing.

The difference between constrained and unconstrained firms

Finance source	Employees/ sector (n=21)	Employees/ firm age (n=21)	Employees/ state (n=18)	Employees/ annual auditing (n=18)	Sector/firm age (n=18)	Sector/stat e (n=17)	Sector/ann ual auditing (n=17)
Bonds	0.000	-0.048	0.021	-0.028	-0.004	0.013	-0.006
	(0.649)	(0.520)	(0,790)	(0.476)	(0.548)	(0.451)	(0.592)
PE/VC	-0.611**	-0.040	-0.032	-0.045	-0.032	-0.329	-0.111
	(0.338)	(0.332)	(0.185)	(0.245)	(0.266)	(0.198)	(0.351)
Subsidized loans	0.004	0.044	-0.029	0.037	0.007	-0.013	0.011
	(0.128)	(0.121)	(0.090)	(0.104)	(0.081)	(0.097)	(0.084)
Commercial banks	0.065	0.122	-0.071	-0.008	0.079	-0.038	0.010
	(0.470)	(0.401)	(0.266)	(0.341)	(0.412)	(0.346)	(0.335)
New equity	0.033	-0.039	-0.015	0.043	0.047	-0.016	0.009
	(0.260)	(0.194)	(0.202)	(0.233)	(0.197)	(0.227)	(0.241)
Retained earnings	-0.003	-0.045	0.016	-0.016	-0.007	0.013	-0.007
	(0.255)	(0.235)	(0.235)	(0.218)	(0.212)	(0.225)	(0.219)

Notes: Firms are matched in accordance with Campello et al. (2010) across the number of employees and sectors of activity, resulting in 42 firms in total. We then match firms in accordance with firm age, state, and annual auditing using propensity score matching. Control firms are debt unconstrained (with less than 10% debt) and treated firms are severely constrained (with more than 90% debt). With regard to each case, we estimate the differences in preference for bonds, private equity/venture and capital funds (PE/VC), subsidized loans, commercial banks, new equity, and retained earnings. Standard errors are in parentheses. ** indicates significance at the 5% level.

Finally, we examine the effect of growth opportunities on the preference to use internal sources. Thus, we run a logit regression with a dummy variable for growth opportunities on the left-hand side. This variable has a value of 1 when planned growth is higher than the market average and 0 otherwise. On the right-hand side, we use a dummy variable for retained earnings (with a value of 1 for firms that have a high preference for this funding source) and a dummy variable for constrained firms. We also control for firm age, annual auditing, and region. The results presented in Table 6 show that growth opportunities increase the likelihood of a preference for retained earnings. This statistically significant result may show that the pecking order is strong and that high-growth firms have a greater preference for retained earnings. A possible explanation is that growth opportunities increase the preference for retained earnings as a means used by ultimate owners to maintain control of a growing firm and have less reliance on external financing.

Table 6. Effect of growth opportunities on the preference for internal sources of Funds.

	(1)	(2)	(3)	(4)
Retained earnings	0.054*	0.076*	0.086*	0.121*
	(0.082)	(0.051)	(0.046)	(0.039)
Debt constraints	-0.001		-0.002	
	(0.105)		(0.083)	
Controls	Yes	Yes	No	No
Pseudo-R^2	0.38	0.43	0.38	0.29
Log likelihood function	-1809.8	-1541.5	-1809.8	-1295.1
Chi squared	1589.6	1410.1	1589.6	1119.4
Cross-dep ($H_0 : R = I_N$)	0.001	0.001	0.001	0.001

Notes: This table reports the logit regression results where the dependent variable is a dummy variable that equals 1 when growth opportunities are higher than the market average and 0 otherwise. The explanatory variables include *debt constraint*, which is a dummy variable that has a value of 1 for debt exceeding 50% of preferred resources. We also use a set of control variables: *firm age*, a dummy variable for annual auditing, and a dummy variable for regions. We report the marginal effects. * indicates significance at the 10% level.

The estimation results for model (1) show that the marginal probability of the coefficient is approximately 5%. This finding means that higher growth opportunities increase the preference for retained profits by 5%. Moreover, the finding reveals that the pecking order is not only present in our sample but is also reinforced with regard to greater investment opportunities. One would expect that increased growth opportunities should leave the preference for retained profits unchanged. It seems that ultimate owners have a stronger preference for control if they can perceive more growth opportunities. Control is only shared, via preferences for debt or new equity, if owners cannot foresee a need for new investments. Ultimate owners place greater value on control for expansion than for use in stagnant firms, a view that is in accordance with the pecking order theory. We repeat the estimation process once, omitting the *debt constraint* variable in model (2), omitting the set of control variables in model (3), and omitting all of these variables in model (4). The qualitative results remain the same.

5. Summary and conclusions

This study aims to investigate whether firms follow the pecking order theory. While the literature has focused on public listed firms in developed countries, we are the first to use a direct approach (via a survey) to explore the behavior of private (unlisted) SMEs in Brazil.

We find that 50% of ultimate owners prefer to use internal resources rather than other resources (such as loans and debt). Using a PSM approach based on firms that are debt constrained and unconstrained, we find no differences between the owners' preferences in terms of sources of financing. This result holds for different robustness checks. Thus we conclude that the pecking order seems to be a better fit for the preferences of owners of SMEs in Brazil.

Another salient result comes from a regression of the preference for retained profits on growth opportunities. We find that the perspective of higher growth, and thus greater profit, enhances the preference for retained profits, a proxy for control. The direct relationship between growth opportunities and retained profits not only verifies the pecking order theory, it also reveals one of the theory's main mechanisms, the preference for control. Finally, the results do not show a preference for subsidized loans. This finding is quite astonishing given that such loans are a much cheaper source of capital than any other in Brazil.

Taken together, it seems that the folklore figure of the ultimate owner who values control over efficiency (see, for instance, Thomsen & Pedersen, 2000), seems to be a valid representation in the context of the Brazilian economy. This pattern should find an echo in countries with a similar background. Control and ownership are tightly associated, even at the expense of growth or the benefits of leverage. In Brazil, as in many emerging countries, the corporate bonds market is small and illiquid, and government debt usually outweighs corporate indebtedness. The new generation of shareholders may allocate capital more efficiently, but there seems to be little doubt that such preference for control comes at the expense of some economic growth.

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