**ACADEMIC
INVESTIGATIONS
& CONCEPTS**

SECTION 1

FIRM AGE, VALUE, PERFORMANCE AND CORPORATE GOVERNANCE IN BRAZIL

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Abstract

Several articles analyze the life cycle of firms and identify throughout time that their performance has an inverted U shape. Firms achieve an optimal level and, thereafter, decline due to lack of flexibility and difficulties to keep up with market changes. The objective of this study is to investigate whether there is a relation between firm age, value and performance in Brazilian companies, and we verify if firm age has an affect on their governance practices. We analyze 250 Brazilian listed firms from 2002 to 2009. Our results indicate that the relation is not shaped as an inverted U in Brazil, and that older firms show higher value and better return on their investments. We also report that older firms show better governance practices.

Keywords: Firm Age, Corporate Governance, Firm Value And Performance

1. INTRODUCTION

Since Arrow's study (1962) on the effects of learning in firms, the age of companies has been an issue in various studies related to such effects. Several models have indicate and listed positive and negative impacts resulted from maturity, reaching to theories of identification of structural lack of flexibility and processes (Leonard-Barton, 1992), studies on life cycle of firms, and to management models, as solution to a scenario where companies show signs of obsolescence (Collins and Porras, 1994).

In the course of time, firms tend to improve their performance by increasingly enhancing their practices, reducing costs and optimizing processes, thereby becoming more and more agile and efficient in their production (Arrow, 1962). Throughout time, the cost for better efficiency is translated into the lack of flexibility in the firms' structure. When an institution operates at its optimal levels, it shows lack of flexibility to innovations imposed by the market. Consequently, it tends to face greater difficulties to get out from a state of inertia that younger firms do not face (Leonard-Barton, 1992). Such inertia is also shown in firm's human resources wherein such knowledge and abilities, perpetuated in their operations, become obsolete whenever facing new market practices.

In several articles analyzing the North-American case, it was detected a lifecycle in firms. Throughout time the efficiency would have an inverted U shape wherein the firm would reach an optimal level and, thereafter, would decline due to lack of flexibility and to difficulty to keep up with market changes.

Evans (1987) and Cooley and Quadrini (2001) show increased performance with age, subsequent negative concavity, and a final stabilization to a certain rate of growth. In other words, firms are benefitted from having at their disposal more efficient processes and greater market knowledge, up to a certain baseline where the rate of growth tends to stabilize.

Loreder and Waelchili (2009) make an experiential study to capture the direct relationship between age and firm performance, viewing the lack of flexibility to innovations as a direct effect of aging. By splitting the variables, such as degree of specialization and size, these authors conclude that firms tend to face serious problems with aging that have a negative impact and a positive concavity. The authors show efficiency deterioration due to aging which results in increasing costs and slimmer profit margins. They conclude that, in general, firms listed

at the stock exchange for over 15 years are unable to keep up with good results showed by younger firms.

There are also studies showing that age is positively related to good practices of governance (Ariff, Ibrahim and Othman (2007) and Almeida and Santos (2008)). Ariff, Ibrahim and Othman (2007) make a comparative study about variables related to governance reporting of firms in Malaysia. Despite the results showing a strong correlation between levels of governance and firm size, firm age is positively related with governance. Firms with history of good reputation and experience have greater skills to separate good and bad governance practices. Almeida and Santos (2008) study 101 Brazilian firms and find the influence of firm's size and age in the levels of governance, which is consistent to Ariff, Ibrahim and Othman (2007).

The objective of this study is to investigate the relation between firm age, value, performance and governance practices of Brazilian companies. We analyze 250 Brazilian listed firms from 2002 to 2009. Our results indicate that the relation does not have the shape of an inverted U in Brazil, and that older firms show greater value and better return. We also show that older firms have better governance practices.

2. DATA AND METHODOLOGY

Our sample is comprised of 250 non-financial firms listed at BM&FBovespa stock exchange from 2002 to 2009. The incorporation dates of these firms (to calculate their age) come from the stock exchange's website, and the financial and accounting data come from Economatica database.

We used the return on asset (ROA) and the price-to-book (P/B) as firm performance and value, respectively. These two variables were tested separately with the objective to confirm the influence of aging in the performance and value of the firms. To measure the quality of governance, we used the corporate governance index (CGI) of Carvalhal and Leal (2005) and the listing on BM&FBovespa's New Market (NM).

We ran panel regressions of 250 firms from 2002 to 2009 to analyze the relation between firm age, value, performance, and governance. The Hausman's test indicated the fixed-effects panel as the most adequate. The regressions using P/B, ROA, CGI and NCG as dependent variables have the following specifications:

$$P/B_{i,t} = \beta_1 + \beta_2 AGE_{i,t} + \beta_3 VOT_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \varepsilon_{i,t} \tag{1}$$

$$ROA_{i,t} = \beta_1 + \beta_2 AGE_{i,t} + \beta_3 VOT_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \varepsilon_{i,t} \tag{2}$$

$$CGI_{i,t} = \beta_1 + \beta_2 AGE_{i,t} + \beta_3 VOT_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \varepsilon_{i,t} \tag{3}$$

$$NM_{i,t} = \beta_1 + \beta_2 AGE_{i,t} + \beta_3 VOT_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \varepsilon_{i,t} \tag{4}$$

where, *P/B* is the price to book (ratio of market value to capital stock value), *ROA* is the return on assets (EBITDA/total asset), *NM* is a dummy variable equal to 1 when a firm is listed at BM&FBovespa's New Market, *CGI* is the governance index by Carvalhal and Leal (2005), *AGE* is the number of years of existence of the firm since its constitution, *VOT* is the voting capital of the major shareholder, *SIZE* is firm size (log of total assets), and *LEV* is firm leverage (liabilities/total assets).

The control variables (VOT, SIZE and LEV) were selected from the literature on determining factors of firms' value, performance and governance. The expected sign of VOT in the value, performance and governance is negative (Carvalhal and Leal (2005)), as the major concentration of voting shares does not represent good governance practices and negatively affect the value and performance of firms.

The expected signs of SIZE and LEV in firm value and performance are not clear. If, on one hand, larger firms may be more solid and with a larger cash flow generation capability, on the other hand, smaller firms may have bigger growth opportunities. The same relation may be applied to leverage. More leveraged firms may show more probability of facing financial difficulties, but may have more investment opportunities; therefore, their leverage is higher to allow successful projects. As regards to the influence of SIZE and LEV in governance, there exists a full range of literature showing that governance is positively related to the size of the firm and negatively to its leverage (Sheifer and Vishny (1997)).

The age concavity was also tested by including the variable AGE^2 in order to ascertain the possibility of predicting an increase in growth or point of inflexion, which allows us to state that – and under what aspect – firms profit as they mature.

3. RESULTS

Table 1 shows the descriptive statistics of the variables from 2002 to 2009. The results show that firm's age varies from 0 to 109 years and the average age of 33.27 years indicates a relatively young market as compared to other economies. On average, firms have a price-to-book of 2.41 and a ROA of 3.94%. Governance practices are regular, only 26% of firms are listed on New Market, with an average CGI of 4.79 (out of 10 possible points). The controlling shareholder has 61% of the voting shares, and firms use more loans than shareholders' funds (average leverage of 60%).

Table 2 shows the correlation matrix among the variables. We note that the firm age is positively correlated with firm value, return and governance, with correlations varying from 0.05 (with P/B) to 0.24 (with CGI).

Table 1. Descriptive Statistics

Descriptive statistics of all variables used in the study from 2002 to 2009. The definition of variables is reported in section 3.

Variable	Mean	Median	Standard Deviation	Min	Max
AGE	33.27	34.00	25.78	0.00	109.00
P/B	2.41	1.40	4.51	0.10	73.90
ROA	3.94	3.30	13.70	-85.20	426.70
NM	0.26	0.00	0.44	0.00	1.00
CGI	4.79	4.50	1.69	0.75	9.50
VOT	61.33	59.65	27.44	2.00	100.00
SIZE	6.03	6.08	0.91	0.48	8.85
LEV	60.23	61.80	23.14	0.00	99.90

Table 2. Correlation Matrix

Matrix of correlation of all variables used in the study from 2002 to 2009. The definition of variables is reported in section 3.

	P/B	ROA	NM	CGI	AGE	VOT	SIZE	LEV
P/B	1.00							
ROA	-0.01	1.00						
NM	0.05	0.03	1.00					
CGI	0.10	0.10	0.59	1.00				
AGE	0.05	0.10	0.15	0.24	1.00			
VOT	-0.06	0.03	-0.22	-0.29	-0.02	1.00		
SIZE	-0.02	0.02	0.35	0.36	-0.05	-0.01	1.00	
LEV	0.20	-0.18	-0.06	-0.09	0.07	0.06	0.30	1.00

We divided the firms in two groups according to the median of age. Table 3 shows the results of the tests of differences in mean and median to analyze if there is a significant difference between value, performance and governance among "young" and "old" firms (average age of 11.58 and 54.97 years, respectively).

Our results indicate that P/B and ROA of old firms (2.73 and 5.10%, respectively) are higher than those of young ones (2.11 and 3.73%, respectively). The differences of mean and median are statistically significant at 1%. Furthermore, the governance practices of old firms are better than those of young firms. On average old firms have higher CGI (5.57 versus 4.56) and tend to list more on New Market (49% versus 30% of the firms). The differences of mean and median are statistically significant at 1%.

Table 3. Characteristics by Firm Age

The sample was divided in two groups: "young" and "old" companies, according to the median of firm age. The mean and median (in parenthesis) of each variable are reported. The definition of the variables is reported in section 3. We performed a test of differences in mean and median to analyze the existence of a significant difference between the two groups, and the p-value of the test is reported. ***, **, and * indicate statistical difference at 1%, 5% and 10%, respectively.

Variables	"Young" Firms	"Old" Firms	P-value of test of differences
P/B	2.11 (1.20)	2.73 (1.80)	0.00*** (0.00***)
ROA	3.73 (3.50)	5.10 (3.80)	0.00*** (0.00***)
NM	0.30 (0.00)	0.49 (0.00)	0.00*** (0.00***)
CGI	4.56 (4.46)	5.57 (5.52)	0.00*** (0.00***)
AGE	11.58 (9.00)	54.97 (51.00)	0.00*** (0.00***)
VOT	57.60 (56.50)	58.48 (56.00)	0.54 (0.81)
SIZE	6.21 (6.22)	6.18 (6.16)	0.37 (0.11)
LEV	57.79 (60.10)	59.81 (60.70)	0.07* (0.06*)

Table 4 shows the panel regressions relating firm age to P/B. The results are consistent to the ones obtained in Tables 2 and 3, indicating a positive relation between firm age and value. The variable AGE^2 was significant and positive in only one model, so we cannot conclude that there is a non-linear relation between age and value.

Table 4. Firm Value and Age

Fixed-effects panel regressions where the depending variable is the price-to-book (P/B) from 2002 to 2009. The definition of variables is reported in section 3. The p-values adjusted by autocorrelation and heteroscedasticity are reported in parenthesis. ***, ** and * indicate statistical significance at 1%, 5% and 10%, respectively.

Variable	I	II	III	IV
AGE	0.13*** (0.00)	0.06 (0.15)	0.20*** (0.00)	0.15*** (0.01)
AGE²		0.05** (0.05)		-0.03 (0.19)
VOT			-0.01 (0.41)	-0.01 (0.42)
SIZE			-1.82*** (0.01)	-1.79*** (0.01)
LEV			0.05*** (0.00)	0.05*** (0.01)
R² adj	0.43	0.45	0.52	0.53

Table 5 shows the panel regressions relating firm age to ROA. Similar to Table 4, the results indicate a positive relation between firm age and performance. The variable AGE² was not significant.

Table 5. Firm Performance and Age

Fixed-effects panel regressions where the dependent variable is the return on assets (ROA) from 2002 to 2009. The definition of the variables is reported in section 3. The p-values adjusted by correlation and heteroscedasticity are reported in parenthesis. ***, ** and * indicate statistical significance at 1%, 5% and 10%, respectively.

Variable	I	II	III	IV
AGE	0.28*** (0.00)	0.26** (0.00)	0.25** (0.05)	0.23* (0.10)
AGE²		0.01 (0.56)		0.02 (0.28)
VOT			0.00 (0.79)	0.01 (0.87)
SIZE			0.34 (0.87)	0.32 (0.87)
LEV			-0.21*** (0.00)	-0.21*** (0.00)
R² adj	0.35	0.35	0.45	0.45

Table 6 shows the panel regressions relating firm age to CGI. The results indicate that, similar to Ariff and Othman (2007) and Almeida e Santos (2008), older firms have better governance practices. The results are all statistically significant at 1%. The variable AGE² was significant and negative in only one model.

Table 6. Corporate Governance Index and Firm Age

Fixed-effects panel regressions where the dependent variable is the governance index by Carvalhal and Leal (2005) from 2002 to 2009. The definition of variables is reported in section 3. The p-values adjusted by autocorrelation and heteroscedasticity are reported in parenthesis. ***, ** and * indicate statistical significance at 1%, 5% and 10%, respectively.

Variable	I	II	III	IV
AGE	0.11*** (0.00)	0.12*** (0.00)	0.06*** (0.00)	0.06*** (0.00)
AGE²		-0.01** (0.02)		-0.01 (0.34)
VOT			-0.02*** (0.00)	-0.02*** (0.00)
SIZE			0.81*** (0.00)	0.81*** (0.00)
LEV			-0.01** (0.03)	-0.01** (0.02)
R² adj	0.82	0.82	0.84	0.84

Table 7 shows the probit regressions relating firm age to New Market listing. The results indicate that older firms show better governance practices. The results are all statistically significant at 1%. The variable AGE² was significant and negative in only one model.

Table 7. New Market Listing and Firm Age

Probit regressions where the dependent variable is the presence of the firm on BM&FBovespa's New Market from 2002 to 2009. The definition of variables is reported in section 3. The p-values adjusted by autocorrelation and heteroscedasticity are reported in parenthesis. ***, ** and * indicate statistical significance at 1%, 5% and 10%, respectively.

Variable	I	II	III	IV
AGE	0.05*** (0.00)	0.05*** (0.00)	0.01*** (0.00)	0.01*** (0.00)
AGE²		-0.01*** (0.00)		-0.01 (0.30)
VOT			-0.01*** (0.00)	-0.01*** (0.00)
SIZE			0.28*** (0.00)	0.28*** (0.00)
LEV			-0.01*** (0.00)	-0.01*** (0.00)
McFadden's R²	0.72	0.72	0.88	0.88

4. CONCLUSION

The objective of this study is to investigate the relation between firm age, value, performance and governance of Brazilian companies. We analyzed 250 Brazilian listed firms from 2002 to 2009. As opposed to international literature, which indicates that firm performance increases with time and declines upon its reaching an optimal level, our results indicate that firm value and return increase with time in Brazil.

Moreover, we show that older companies have better governance practices. This may be due to an inherent natural maturity that mitigates agency problems or, to a great extent, to the evolution of corporate governance in Brazil, which has improved and developed significantly in more recent years.

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