

FUNDING DECISIONS IN BRAZILIAN COMPANIES: A COMPARISON BETWEEN STATIC TRADEOFF AND PECKING ORDER THEORY IN BRAZIL

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ABSTRACT

The comparison between two theories in the finance field on the capital structure in the companies is the aim of this work. Using tests developed by Shyam-Sunder & Myers (1999) and Rajan & Zingales (1995), the data from 2000 to 2010 of non-financial Brazilian companies of open capital were analysed to verify if they preferred the behaviors previewed in the Static Trade-off Theory or the ones of the Pecking Order Theory. The results obtained point to the probable preference for the behavior foreseen by the Pecking Order Theory, that is, the companies studied, in the analysed period, used, at first, sources internally generated (operating cash), using, in second place, the resources from third parties, through bank loans or emissions of debentures, issuing shares just as the last resource. Another conclusion was that the open capital Brazilian companies probably did not try to reach or keep an ideal indebtedness goal, which balances the costs and benefits generated by the loans.

Keywords: Capital Structure. Static Trade-off Theory, Pecking Order Theory, Financial Decisions, Funding Sources

1. INTRODUCTION

How must a company fund itself in order to obtain the greatest advantages, not only for its owners, but also for the benefit of the society it works on? This is a question which remains without an unambiguous answer, even after intense research work which has been carried on in several countries for many years. Which capital brings more advantages for the company, its own or a third party's? Should the company pay as little as possible of dividends in order to fund itself with the profit retention? The researches have given several answers to those questions, but there has not been a complete theory yet that explains how and why the companies take their financial decisions, or how they should act in order to increase their value and usefulness.

The aim of this work was to verify how the open capital Brazilian companies, with the exception of the banks and insurance companies, fund themselves. The research verified whether they try to keep a target for the value of the loans concerning their own capital, as foreseen in the *Static tradeoff theory* (STT), or they search resources according to the investment need always looking for less burdensome sources, as expected by the *Pecking order theory* (POT).

2. LITERATURE REVIEW

In the article "The Capital Structure Puzzle" written by Myers (1984, p. 575), the author asks, "How do firms choose their capital structures?" Again, the answer is, "We don't know", which means that the choice of the structure of capital, even after everything which had been written up to that date, was still a great unknown thing. It was in that article that, maybe for the first time, an author compared the theories known as the Pecking Order Theory and the Static Tradeoff Theory.

There are many works about Brazilian Companies and their capital structure (Carvalho et al., 2011; Lima et al., 2011; Matias Jr. et al., 2011). The propositions tested to check the behavior pattern of the Brazilian companies analysed were the following:

I – The Brazilian companies fund themselves mainly with their own capital, that is, propitiated by their operating cash flow. In case of need of more resources, they appeal to, in second place, third party's loans and funding or the sale of debentures or similar bonds. Just as the last resource, those companies issue shares in the Securities Market (POT).

II – The funding model used by the open capital Brazilian companies is the one of the maintenance of an optimal capital structure, behaving according to the model known as "*Static Tradeoff Theory*" (POT), seeking, this way an ideal target of loans which balance costs and benefits.

After the articles of Myers (1984) and Myers & Majluf (1984), several researchers have been working on the examination of the effectiveness of the POT and STT Theories, but without conclusive results. In several researches, the conclusions have been on a possible new theory which agglutinates valid aspects of both approaches as well as of others. Many premises related to both theories, such as information asymmetry and the agency conflicts, keep on being researched and have confirmed, partially, its validity.

Up to 1998, most of the works sought evidences of one or another theory, separately, looking for behavior evidences based on the information asymmetry for the POT or of cost and benefit balance of indebtedness for the STT. There were also researches on the factors which led to a determined level of indebtedness or that explained why the companies preferred to use internal sources and debts instead of shares.

In the researched literature review, the first work that did the empirical comparison between both theories was the one of Shyam-Sunder and Myers (1999), who sought to check how the companies cover their financial deficits. Using a hierarchy of sources, as previewed in the POT or trying to maintain a target for the funding percentage in relation to the own capital, as previewed in the STT, the conclusion of the authors was that the POT explains the behavior of the companies studied much better than the STT.

The variables used by Shyam-Sunder and Myers (1999) were the Deficit (DEF) of each "t" period for each "i" company, computed by adding the payment of dividends (DIV), the expenditures of capital (X), the working capital variation (ΔW) and the installment of current expiration of long-term debts (R) and subtracting the operational cash flow after interests and taxes (C). The authors, then, set a regression in which the dependent variable was the variation in loans in each period (D) and the independent one was the deficits (DEF).

The main novelty of the Shyam-Sunder and Myers' article (1999) was that the authors did not use factors to prove the theories indirectly, but they checked how the liabilities due to the payment of new investments and dividends were covered, year after year. The conclusion, as previously mentioned, was that after using the funds generated internally, the use of loans surmounts greatly the share issue.

Opposed to the method of Shyam-Sunder and Myers (1999), Chirinko & Singha (2000) showed that there can be situations in which the equation used by those authors points falsely to results that do not correspond to the reality. They pointed out three kinds of main problems. In the first case, the authors gave the example of a company that despite giving preference to loans after having used internal funds, still sought about 22% of its needs of equity capital. In this case, the equation points falsely to the STT, since the company uses the hierarchy previewed in the semi-strong POT.

In the second case, Chirinko & Singha (2000) showed that a company using, at first, issue shares and only afterwards seeking loans, can also be falsely considered as obeying the POT. In the third and last example, the same authors show that even if the company issues shares and bonds in fixed proportions (using more loans than shares, though), the equation will give results favorable to the POT, since this kind of procedure demonstrates the company's attempt to keep a fixed funding target as previewed in the STT.

Despite the lucky hit of Chirinko & Singha's criticism (2000), in this dissertation, Shyam-Sunder and Myers's Method (1999) will be used with the adaptations showed in the work methodology, taking the precautions of checking if any of the factors showed by those authors are disfiguring the results.

Fama & French (2000) also compared both theories, checking the matter of the financial leverage and the payment of dividends. In this research, factors such as size, profitability, investment opportunity, among others were used, but the authors could not conclude in favor of any of the two theories. Many factors with shared previews by both models were confirmed. In the not-common previews, the negative correlation between the profitability and the indebtedness level favored the POT.

Frank & Goyal (2002), while studying a great number of American companies, found out that the external funds and share issues between 1971 and 1998 were way above what is accepted by the Pecking Order Theory (POT). The great afflux of smaller companies in the open market during the 80's, but mainly in the 90's, influenced very much result reached by Frank & Goyal (2002), since those companies issue many more shares than the big and mature ones.

The main novelty of Lemmon and Zender's work (2002, p.7) was that, to use the equation of Shyam-Sunder and Myers (1999), the authors selected the companies according to the "Capacity in taking

debts" (debt capacity). According to the authors, this capacity is an important premise defined by Myers (1977) as the point in which, when issuing more bond debts, the company loses its market value. The authors showed that the behavior of new companies, of great growth, is different from the mature companies. The first ones, in general, have fewer internal fund generation, and, therefore, greater deficits and many times they prefer to fund themselves with share issues. This difference, which authors such as Frank & Goyal (2002) point as contrary to the POT, are in fact previewed in the theory.

The results obtained by Lemmon & Zender (2002) were that the companies with greater growth opportunities (high market value when compared to the book one), use fewer loans and companies with more tangible assets, use more. Older companies also have a financial leverage level a little greater than the new ones. The authors also found out negative correlation between profitability and indebtedness level, corroborating the preview of the POT. The conclusion of Lemmon & Zender (2002) was favorable to the POT.

3. METHODOLOGY

The methodology to test empirically the *Peking Order Theory* (POT) had the model used by Shyam-Sunder & Myers (1999), and adapted by Frank & Goyal (2002) as basis. The main difference of this research is that the total deficit of each company was used instead of the operational deficit, like the original authors did. To test the *Static Trade-off Theory* (STT) the regression used originally by Rajan & Zingales (1995) was applied.

The method to test the POT uses the following variables, always for the "t" period and for the "i" companies; *Def*, which is the deficit of funds for each company; *Div*, which is the payment of dividends in the period; *Inv*, which are the expenditures of fixed capital; *Cg*, which represents the variation of working capital in the period; *Oa*, which are the other investments of the company; *Of*, which are the other sources of non-financial resources, and *Fc*, which represents the operational cash flow of the period. So, the formula used to calculate the deficit of each period is the following:

$$Def = Div + Inv + Cg + Oa - Of - Fc \quad (1)$$

With the deficit calculated for all the periods, a regression is set up using the following variables, also for the "i" companies and "t" periods. ΔD , which is the dependent variable and which represents the variation of the loans in the period, and which may be negative or positive; "a", which is the regression intercept; "bpo", which is the coefficient of the dependent variable and "e", the error of the regression. The dependent variable is the *Def*, calculated in the formula 1. The model to be tested is as shown in the equation below:

$$\Delta D_{it} = a + b_{po} Def_{it} + e_{it} \quad (2)$$

The tendency in the regression represented in the formula three is that, if the *pecking order theory* hypothesis is correct, the intercept "a" gets close to zero and "bpo" gets close to the unity. The reasoning is that if the companies do not use the share issues, the variations in the debts will be equal to the variation in the deficits of the periods.

In the second part of the empirical work, in which the model known as "*Static Tradeoff Theory*" (STT) is tested, the regression below was used, according to the model proposed by Rajan & Zingales (1995):

$$D_{it} = \alpha + \beta_T T_{it} + \beta_{MBV} MBV_{it} + \beta_{LS} LS_{it} + \beta_{LCR} LCR_{it} + \varepsilon_{it} \quad (3)$$

In which *Dit* is the total of the indebtedness in the "t" period by the "i" company, the indexes α and β are the regression coefficient, ε is the error of the period, *T* is the tangibility of the assets, represented by fixed/permanent, *MBV* is the index resulting from dividing the market value/asset value, *LS* is the natural sales logarithm ($Ln(Turnover)$) and *LCR* the profitability, represented by net Profit/Equity.

The coefficients expected, in the case of the STT, are positive for the tangibility (*T*), negative for the growth opportunity (*MBV*), positive for size (*LS*) and positive for the profitability (*LCR*). Those signals expected for the coefficients are the same of Frank & Goyal's work (2002) and Medeiros and Daher's (2008), with the different that Frank & Goyal (2002) tested the POT and this research tests the STT; therefore, they expected negative signal for the profitability, while this work expects positive signal.

4. ANALYSIS OF RESULTS

The table below summarizes the results of this first part of the empirical research which uses the equations 1 and 2 to test whether the companies fit the behavior previewed by the POT.

Table 1 - Def Regression X Debts(POT)

	Number of Companies	Square R adjusted	Regression Significance	Regression Coefficient			
				Constant	Signif.	DEF	Signif.
2000	324	0.88	0.000	-15.987	0.009	0.84	0.000
2001	321	0.92	0.000	NSign	0.232	0.92	0.000
2002	314	0.83	0.000	NSign	0.374	0.80	0.000
2003	314	0.98	0.000	NSign	0.078	0.95	0.000
2004	338	0.92	0.000	NSign	0.331	0.86	0.000
2005	323	0.70	0.000	NSign	0.307	0.65	0.000
2006	321	0.98	0.000	-72.709	0.002	0.97	0.000
2007	313	0.99	0.000	NSign	0.755	0.82	0.000
2008	331	0.56	0.000	NSign	0.127	0.50	0.000
2009	326	0.95	0.000	-90.470	0.011	0.95	0.000
2010	282	0.87	0.000	-39.025	0.033	0.91	0.000

The values in bold face have significance at the level of 1%, the others at 5%. Up to June 2010..

In nine out of the twelve periods analysed, the square RS adjusted in the regressions became very good, all of them above 0.83, having reached values above 0.92 in five years. The F-ANOVA test validated all the square RS, with statistical significance at the level of 1%, including 2005 and 2008, which were below what was hoped for the validation of the POT.

Therefore, within the sample analysed and in the years in discussion, there are enough evidences to prove that the financial behavior of the companies was within what was previewed by the semi-fort *Pecking Order Theory* , proving that the researched companies always preferred, in the first place, to use resources internally generated.

The results reached in the second part of the empirical research are shown in table 2 below, where the Square Rs and coefficients found are reported using the equation 3, which are useful in checking whether the companies studied fit the behavior previewed by the STT.

Table 2 – Factor Regression x Indebtedness (STT).

Year	Number of companies	Square R Adjusted	Regression Significance	Multiple regression Coefficient			
				LCR	MBV	LS	T
2000	212	0.88	0.000	0,01	1.57	-0.60	NSign
2001	201	0.60	0.000	-5.59	-11.04	-52.41	NSign
2002	186	0.94	0.000	-6.57	NSign	NSign	NSign
2003	187	0.76	0.000	NSign	104.19	-24.00	NSign
2004	195	0.44	0.000	NSign	422.42	NSign	NSign
2005	185	0.08	0.000	-0.27	NSign	NSign	NSign
2006	196	0.85	0.000	-1.40	73.19	NSign	161.14
2007	246	0.50	0.000	-0.97	6.61	9.31	NSign
2008	238	0.01	0.145	NSign	NSign	NSign	NSign
2009	237	0.88	0.000	-8.79	43.41	42.57	255.51
2010	230	0.99	0.000	-0.63	369.57	NSign	NSign

The values in bold face have significance at the level of 1%, the others at 5%. Up to June, 2010.

The square Rs adjusted in the regression were way below in 2005, with value of 0.08, and in 2008, with 0.01. According to the F-ANOVA test, in 2005, the square R was above zero with significance of 0.000. In 2008, however, the same test indicated that there was not the expected regression since the significance was in 0.145. In 2001, 2004 and 2007, as it can be observed in Table 2, the square Rs were reasonable, between 0.44 and 0.60, also with significance of 0.000. In all the other years, the

square Rs were good, with values between 0.76 and 0.99, also statistically significant at the level of one percent.

Summarizing this second part of the research, there are evidences in the results presented in table 2 which point to the behavior foreseen in the POT. The main factor which corroborated the hypothesis favorable to the *Pecking Order Theory* was the profitability that in seven years, out of the ten studied, associated negatively with the total of loans of the companies and just in 2000, there was the signal foreseen by the *Static Tradeoff Theory*. On the other hand, the growth capacity factor, represented by the market value/book value (MBV), had positive signal in seven out of the eleven periods studied, contradicting both theories studied.

5. CONCLUSIONS

The results reached in this work are in accordance with the *Pecking Order Theory* elaborated by Myers (1984) and Myers & Majluf (1984), which deals with the hierarchy of funding sources preferred by the companies. The preference of the companies studied, in most of the years, was, in first place, for the use of internal resources. In case there were deficit for working capital or investment, they fell back upon loans and issued shares in rare occasions. There were not detected evidences which point to the behavior foreseen in the *Static Tradeoff Theory*, that is, the companies studied probably do not keep a loan target that balances costs and benefits provided by the indebtedness.

The reasons which lead to those preferences were not analysed by this study, but they may involve the theory of Myers (1984) and Myers & Majluf (1984) in which the information asymmetry among the managers of the company and the possible buyers of the shares play the main role. It can also be that due to the difficulties and costs of new share issue in Brazil, those companies preferred making loans to issuing new shares.

Concerning the use of the own capital with the profit retention, the most obvious explanation is that those are the cheapest and easier resources to obtain. It is part of the capitalism's own logic that the companies grow using their own profits.. Galbraith (1983, p.168), for instance, shows that most part of the American savings between 1950 and 1980 was done with the profit retention of the companies. In 1976, for example, according to the same author, the private savings in that country added up to 77,8 billion dollars, against 198,6 billion of the companies, mainly great corporations. For the Brazilian companies, the same reasoning is valid.

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