

# STUDY OF CAPITAL STRUCTURES AND CORPORATE SOCIAL RESPONSIBILITY OF NEW YORK STOCK EXCHANGE LISTED COMPANIES: THE CASE OF BRAZIL AND CHINA

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## ABSTRACT

*This study aims to verify whether the capital structure of Brazilian and Chinese companies that disclose Corporate Social Responsibility report, listed on the NYSE, are aligned with the theories of Pecking Order and Trade-off, from 2008 to 2015. It was made the comparison test of means, factorial ANOVA and multiple regressions data on unbalanced panel. The results show that the capital structure of Brazilian companies is aligned with the trade-off theory, while Chinese companies align with the pecking order theory. There is a difference in the leverage of companies that disclose (or not) the report for Brazilian companies, with a positive impact of CSR on leverage, while among Chinese companies the result was not significant. Finally, the leverage of Brazilian companies that publish CSR report differs from Chinese companies that also disclose that report.*

**Keywords:** Capital Structure, Pecking Order, Trade Off, Corporate Social Responsibility, Global Reporting Initiative.

## INTRODUCTION

Capital structure is a strongly debated topic in finance theory. Even the subject being discussed in academic circles since the late 1950, with the works of Durand (1952) and the classic Modigliani & Miller (1958) on the irrelevance of capital structure, the heterogeneity of the empirical evidence shows that the theme was not fully explored.

From these works were developed other articles addressing the same subject, adding disregarded variables in early studies: considered the existence of the cost of failure to the extent that the debt increases (Scott, 1976; Miller, 1977; Deangelo & Masulis, 1980); after that, was added the perspective of agency risk (Jensen & Meckling, 1976), later was analysed information asymmetry and the existence of optimal capital structure (Myers, 1984; Myers & Majluf, 1984; Milton et al., 1991), eventually was proposed the theory of hierarchy in funding sources (Myers, 1984). The inclusion of these variables enshrined the belief that the capital structure should be used to maximize company value through long-term policies. This evolution, in the study on the subject, contributed to the development of capital structure theories, including Trade-off and Pecking order theories.

A company's capital structure is often viewed as a trade-off between the costs and benefits of debt, reinvestment of corporate profits, and a constant investment plan (Myers, 1984). He argues that it should be done to balance the advantages of tax relief with the various costs of bankruptcy and financial constraint. Therefore, if the trade-off theory is correct, there is an optimal level of capital at which the value of the company would be maximized.

The pecking order theory is characterized by predicting that companies choose resources in a hierarchical way. The hierarchy is defined as follows: companies prefer internal financing (retention of profits), adapting dividend payments for investment opportunities, although the adjustment in dividend payments is made gradually; if internal financing is not possible, the company opts for debt because it is safer; if even then there is a need for more capital, the option is to launch marketable securities; and finally, the issuance of new shares, due to their high cost and impact on company value (Myers, 1984; Myers & Majluf, 1984).

The determinants of capital structure are many and none of them can fully explain capital structure completely, for several reasons, the main ones being: each capital structure theory uses different assumptions (Myers, 2001), companies use conditional strategies, that is, they change according to market conditions (Almeida, 2014). Therefore, the various existing determinants complement each other.

The studies have shown convergence for some determinants, such as: growth opportunity, tangibility, rentability, company size, risk of business, Gross Domestic Product (GDP) growth and inflation rate (Titman & Wessels, 1988; Rajan & Zingales, 1995; Healy & Palepu, 2001; Kayo & Kimura, 2011; Öztekin & Flannery, 2012; Forte et al., 2013; Chang et al., 2014; Altuntas et al., 2015; Póvoa & Nakamura, 2015).

Occupying a prominent position on the global business agenda, corporate social responsibility (CSR) has been the target of unprecedented resource and effort initiatives, from disaster response to the development of socially sensitive business practices. As such, it reflects the strategy of creating added value in a way that also develops society by surveying its needs and challenges (Janssen et al., 2015).

The discussion about CSR also started in the 1950s (Almeida, 2014), and its concept imposes a responsibility towards society, in addition to economic and social obligations. One of the main reasons for the pressures for sustainability is the possible restriction of access to capital, raising the cost of capital, directly impacting the capital structure (Caridade, 2011).

CSR figures prominently in efforts in global companies, from assistance in great tragedies to the social development sensitive to business need. The businesses around the world are investing an unprecedented amount of capital and time on CSR initiatives in the value creation of hope for themselves and for the society (Janssen et al., 2015). Although there are several definitions of CSR, all agree that companies need to meet the expectations of society regarding the planning of social responsibility strategies (Saeidi et al., 2014).

With the importance of capital structure for companies and increasing pressure for a more relevant CSR, knowledge about both is indispensable. And this interaction is studied at the academy in recent years focused on maximizing value for the shareholder (Lioui & Sharma, 2012). CSR in China is a problem of global consequences. Due to its worldwide importance, China has an unquestionable role in the world economy. With global companies settling on Chinese soil, the ethical and social dimensions of business practices have become the focus of debate, as since 2007, industrialization and urbanization has been accompanied by pollution, the target of news in the international media.

In the Brazilian case, the advance on CSR information occurred earlier than in China, with the requirement to disclose information, as well as stricter laws that burden the company in case of non-compliance (Abreu et al., 2012). On the other hand, such determinations, as they are mandatory, may become less relevant to the market and, consequently, to the capital structure.

As important participants in the world economy, and the BRICS, becomes relevant the study of the capital structure of their companies. However, due to differences in legislation and behaviour, it is necessary to work in an equalizer market that gives the importance of the US market, since it reduces the legal disparities between the two countries. With its strong regulation and legislation, it is applied also for companies from other countries that have American Depositary Receipt (ADR).

As assisting factor, the Global Reporting Initiative (GRI), known voluntary reporting platform, be it environmental responsibility or performance corporate (Brown et al., 2009), provides parameters for disclosure companies' information and their attitudes towards society.

The GRI is defined as a sustainability report the practice of measuring disclosure and being responsible for its internal and external effects, with an organizational performance from the perspective of sustainable development (GRI, 2010).

The most significant points in a sustainability report in recent years include: social impact indicators; corporate governance information; integration between sustainability and financial reporting; regional differences and control practices; and persistence with information and participation issues in multinationals (Kolk, 2005, 2006; Palenberg et al., 2006).

In this sense, the present research seeks to answer the following question: What is the alignment of the Capital Structure of Brazilian and Chinese companies, which publish the Corporate Social Responsibility report on the NYSE, based on the main Capital Structure theories?

## RESEARCH METHODOLOGY

The research population was composed by Brazilian companies and Chinese's capital opened listed on the New York Stock Exchange (NYSE), with 2008 to 2015 information and contained in the database of Bloomberg<sup>®</sup> and Compustat<sup>®</sup>. The first criterion adopted for the selection of companies was that they were negotiable in 2016.

Assuming that corporate social responsibility (CSR) can be an important attribute in explaining debt choices of companies, was used the GRI reports to obtain the sample of companies that discloser CSR information. Of the population of 25 companies in the NYSE, financial sector companies were excluded, which totalled 22 companies in the sample for Brazilian companies. It is noteworthy that BrasilAgro's accounting information was not included in 2015, although it was active and negotiated. For this reason, 2015 has only 21 Brazilian companies.

For Chinese companies, out of the population of 63 companies, the financial sectors (three), Software (two) and Computer Software and Services (four) were excluded. In addition, four other companies that did not have information on long-term debt for at least three years in the period analysed were excluded, totalling the sample with 50 Chinese companies.

To represent the capital structure, the following debt proxy was used as the dependent variable: Leverage (ALAV): Measured by the ratio of long-term debt to the company's total assets. Based on the literature review, the following explanatory variables were used for the research (Table 1):

<b>VARIABLE</b>	<b>INITIALS</b>	<b>OPERAT.</b>	<b>REFERENCES</b>
Size	SIZE	Market Value Log <sub>10</sub>	Titman & Wessels (1988) ; Tristan & Dutra ( 2012) .
Tangibility	TANG	Inventory + Fixed Assets / Total Assets	Rocha ( 2007) ; Bastos et al. (2009); Ceretta et al (2009); Goyal et al. (2011); Tristan & Dutra (2012); Correa et al. (2013).
Growth Opportunity	GROW	(Total Assets - Total Equity + Share Market Value) / Total Assets	Nakamura et al. (2007); Bastos et al. (2009); Goyal et al. ( 2011) ; Correa et al. (2013); Forte et al. (2013).
Profitability	RENT	Net Income / Equity	Brito et al. (2007); Bastos et al. (2009) ; Rocha ( 2009) ; Correa et al. (2013).
Business Risk	RISK	Standard Deviation of EBIT / Total Assets	Titman & Wessels (1988) ; Rocha (2007); Rocha (2009);
GDP growth	GDP	GDP growth over previous year	Bastos et al. (2009); Martins & Terra (2014) .
Inflation rate	INFL	Annual Consumer Price Index Rate	Frank & Goyal (2009) ; Öztekin & Flannery (2012) ; Martins & Terra (2014).

Likewise, based on the preceding empirical evidence, it is equally important to present the expectation for each of them, considering the theoretical predictions of Pecking Order and Tradeoff, which is presented in Table 2 below:

<b>VARIABLE</b>	Expected Relationship With Capital Structure	
	Trade-Off Theory	Pecking Order Theory
Size	Positive	Negative
Tangibility	Positive	Positive
Growth	Negative	Positive
Profitability	Positive	Negative
Business Risk	Negative	Negative
GDP growth	Negative	Negative
Inflation rate	Positive	Negative

The estimates the regression modelling equations, comparison of means test were performed with the aid of Stata 12<sup>®</sup>.

### Statistical Methods of Analysis

To compare the two groups, the hypothesis test was used, which aims to provide a method to verify whether the sample data provide evidence that supports or not a formulated hypothesis. In the present research, we will use the factorial ANOVA (Analysis of Variance), which aims to analyse the variances of the sample groups. This test is used to compare averages of more than two samples (Fávero et al., 2009; Stevenson, 2001). In factorial ANOVA, the hypothesis is to test if the sample means are equal. For the null hypothesis to be rejected, it is enough that there is at least one group with a different average from the others (Fávero et al., 2009).

In the case of the current survey, the companies were divided according to nationality (Brazil and China), and according to the disclosure or not of CSR reports. The test was used to identify whether the average capital structure of the sample companies that release CSR reports from 2008 to 2015 are equal to the average capital structure of companies that do not release the same report.

The second ANOVA test was conducted to verify if there is a difference in the capital structure of Brazilian and Chinese companies that release CSR reports, from 2008 to 2015. To verify that the determinants of capital structure of Brazilian and Chinese companies are supported by theories Tradeoff or Pecking Order, have been performed multiple linear regression analysis with panel data. This technique comprises repeated observations of the same set of cross-sectional units. This technique is suitable for the study, since this research will observe the same transverse units for a period of seven years.

## RESULTS ANALYSIS

Both, Chinese and Brazilian companies show expansion in voluntary dissemination of CSR information. For the Chinese's companies there was growth in all years, except from 2010 to 2011 that the number reduced from 22, 22% to 20, 83%. Although, for the Brazilian companies were observed that in 2012 and 2013 reached the milestone of having 80% of companies disclosing GRI, however, in 2014 there was a decrease, with 76% of companies (Table 3).

<b>COUNTRY</b>	<b>DATA</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>China</b>	<b>Total</b>	43	45	45	48	50	48	47	39
	<b>Reporting</b>	5	6	10	10	11	11	12	12
	<b>%</b>	11.63%	13.33%	22.22%	20.83%	22.00%	22.92%	25.53%	30.77%
<b>Brazil</b>	<b>Total</b>	22	22	22	22	22	22	22	21
	<b>Reporting</b>	10	14	14	16	17	17	16	16
	<b>%</b>	48.00%	68.00%	68.00%	72.00%	80.00%	80.00%	76.00%	76.00%

To perform multiple linear regressions analysis with panel data is necessary to know the best regression method, ordinary least squares, fixed effects or random effects. To determine

whether the regression best fits the fixed or random effect, the Hausman test was performed. The Breusch-Pagan Lagrange test verifies whether the model best fits the regression of random effects or ordinary least squares (Table 4).

<b>Country</b>	<b>test</b>	<b>Statistic</b>	<b>Result</b>
Brazil	Hausman	chi 2	2.37
		<i>P</i>	0,9365
	Breusch-pagan	chi 2	366.64
		<i>P</i>	0
China	Hausman	chi 2	12.15
		<i>P</i>	0,0958
	Breusch-pagan	chi 2	531.44
		<i>P</i>	0

Note that for Brazilian companies, the result of the Hausman test indicates regression in random effects more appropriate than the fixed effects, because. In the analysis for Chinese companies, the results are the same of the Brazilian companies. To complement the analysis, Breusch-Pagan test confirms that the random effects are more appropriate than the regression of ordinary least squares was performed the test factorial ANOVA. This test takes into account the company's leverage throughout the survey period from 2008 to 2015 and whether or not the CSR report is disclosed. The tests were performed for companies in Brazil and China, according to Table 5.

<b>Variable</b>	<b>BRAZIL</b>					<b>CHINA</b>				
	<b>SS</b>	<b>DF</b>	<b>MS</b>	<b>F</b>	<b>P</b>	<b>SS</b>	<b>DF</b>	<b>MS</b>	<b>F</b>	<b>P</b>
<b>Year</b>	0.1284	7th	0.0214	0.755	0.604	0.0116	7th	0.0019	0.093	0.996
<b>CSR</b>	0.5819	1	0.5819	20,534	0.001	0.0005	1	0.0055	0.023	0.961
<b>Year # CSR</b>	0.4189	7th	0.5315	18,486	0.009	0.1166	7th	0.0194	0.941	0.467
<b>Mistake</b>	3,656	129	0.0283			2,861	140	0.0206		

For Brazilian companies, according to this test, there is a difference in the leverage of the Brazilian companies that release CSR report, compared to the Brazilian companies that do not release this report. When comparing only the years, there is no statistically significant difference between the years. When considering only CSR, this difference is significant.

Regarding Chinese companies, in all tests made it was not possible to reject the null hypothesis that leverage is the same in all groups analysed.

After testing for a difference, multiple linear regression estimates with unbalanced panel data were made. In this stage, the CSR dummy variable was included, to know what impact of

disclosing the report on the capital structure, in Brazilian and Chinese companies, according to Table 6.

Country	BRAZIL			CHINA		
		ALAV			ALAV	
Variable	$\beta$	<i>z</i>	<i>P</i>	$\beta$	<i>z</i>	<i>P</i>
SIZE	-0.0514	-1.61	0.106	0.0161	1.44	0.148
TANG	<b>0.258</b>	<b>2.5</b>	<b>0.012</b>	<b>0.1733</b>	<b>4.18</b>	<b>0</b>
RENT	-0.0045	-0.18	0.854	0.0089	1.81	0.07
GROW	-0.0079	-0.4	0.692	-0.0233	-1.32	0.185
RISK	<b>-0.7565</b>	<b>-2.26</b>	<b>0.024</b>	<b>-0.4793</b>	<b>-3.97</b>	<b>0</b>
GDP	-0.0011	-0.58	0.56	-0.0043	-1.2	0.23
INFL	-0.0148	-1.92	0.055	-0.001	-0.48	0.629
CSR	<b>0.0455</b>	<b>2.5</b>	<b>0.012</b>	-0.0042	-0.26	0.791
Const.	<b>0.4824</b>	<b>3.33</b>	<b>0.001</b>	0.0281	0.6	0.549
Est. Chi 2	29.54			70.49		
Prob.	<b>0.0003</b>			<b>0</b>		
R2	0.1977			0.2574		

In Brazilian companies, the size variable stands out, which was statistically significant with a negative relationship with the capital structure. This result presents a similar result to that found by Frank & Goyal (2007); Nicoli Júnior & Funchal (2013) and opposite to that found by Titman & Wessels (1988). This indicates that larger companies have a tendency to use domestic financing, such as reinvestment, with a lower level of debt than smaller companies. This relationship is expected by the pecking order theory.

Also noteworthy for Brazilian companies is the risk, which was significant at 5%, with a negative relationship with leverage. These results are consistent with the results found by Brito et al. (2007), who state that higher risk affects the likelihood that cash flows will be sufficient to meet obligations to creditors. But they are distinct from the results found by Bastos et al. (2009); Correa et al. (2013), who found a positive relationship between risk and leverage. Although there are studies with different results, the ones in this paper are in agreement with what is expected by both Trade-off & Pecking Order theories, since the increase of the company uncertainties reduces the probability of future cash flow, reducing the ability to pay the debts and free cash flow for project investment. As a result, increased corporate risk leads to a reduction in leverage due to higher interest rates and a reduction in lenders' offer.

By analysing CSR and leverage, it appears that there is a positive relationship between these two variables in Brazilian companies. It is also notable that the positive relationship between CSR and leverage is significant at 5%, that is, it can be considered that the disclosure of CSR report in the GRI model has a positive impact on the company's capital structure, allowing for greater debt of the company that releases the report.

The difference between the results of Brazilian and Chinese companies, regarding CSR and capital structure, is that the relationship between these variables for companies in the second

country is negative, which is the opposite of the expected. The explanation may lie in the cultural differences of the two countries; in addition, the legislation of the two countries has significant differences, which may affect the maturity of how the market views CSR reporting.

To examine whether there are differences in the capital structure of Brazilian and Chinese companies that disclose report on CSR, was conducted the test factorial ANOVA, to check whether there are differences between the different groups (Table 7).

<b>Variable</b>	<b>SS</b>	<b>DF</b>	<b>MS</b>	<b>F</b>	<b>P</b>
<b>Year</b>	0.07882	7th	0.01126	0.56	0.7842
<b>China</b>	1.06021	1	1.06021	$\frac{5}{3.16000}$	0
<b>Year # China</b>	0.28267	7th	0.04038	2.02	0.04330
<b>Mistake</b>	42,24,773	213	0.01994		

There is a difference in the capital structure of Brazilian and Chinese companies that release CSR reports. By analysing the variables separately, you can see that there is no difference in average leverage across years, but there is between country averages.

Therefore, the result presented shows that there is a difference in the capital structure of companies that report CSR report from Brazil and China. However, the test does not allow to state which has a higher level of leverage, but when analysing the descriptive statistics of the data of this work, it can be stated that Brazilian companies that report CSR report have a higher level of indebtedness than Chinese companies.

## CONCLUSION

The results presented for Brazilian companies indicate that the determinants of capital structure are more consistent with Trade-off theory. Although, it has not been confirmed for all variables, they were the most significant. It is concluded that the capital structure of Brazilian companies, which operate in the NYSE, is supported by Trade-off theory. This means that Brazilian companies are seeking a capital structure in which to balance the benefits and costs of indebtedness, with the aim of maximizing their value.

In a different way, the results for Chinese companies showed that the capital structure is aligned with the Pecking Order theory. Therefore, it can be said that the capital structure of Chinese companies operating in the NYSE is supported by the Pecking Order theory. This result indicates that Chinese companies do not seek a determined capital structure, but act in accordance with existing financing options, giving preference to domestic financing, then debt, bond issuance and, finally, issuance of new shares.

Using the test factorial ANOVA, was observed that there is a difference in capital structure between the companies and which disclose that do not disclose CSR report, for Brazilian companies. In contrast, for Chinese companies, the result was not statistically significant, also, the relationship enters the RSC and the capital structure is negative.

By verifying that the capital structure of the Brazilian and Chinese companies that report CSR are different, the result is that there is really a difference in the capital structures of these companies.



The Chinese companies adopt less the dissemination of CSR reports on the GRI model, compared with Brazilian companies. The capital structures of companies in these two countries are underpinned by distinct capital structure theories. Brazilian companies showed differences in leverages companies that disclose (or not) the GRI report and has a positive effect on the disclosure of the capital structure. The capital structure of Brazilian companies that release the CSR report is different from the capital structure of Chinese companies that also release this report.

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