THE INFLUENCE OF NATIONAL CULTURAL VALUES IN THE CAPITAL STRUCTURE OF ENTERPRISES

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ABSTRACT

This article identifies the influence of national cultural values in the capital structure in addition to the traditional determinants of the capital structure. With this purpose, studies of panel data are performed in 8,986 non-financial enterprises present on the Compustat Global database and in the research of national cultural values of the Schwartz Value Survey (SVS) covering 30 countries, ranging from 1988 to 2003 with 41,778 questionnaires. Evidence was found that the conservatism - intellectual and affective autonomy axes and the hierarchy - equal commitment axis are significant to explain the differences in the capital structure that are not explained by the determinants. The contribution of this article is on the broad review of the study of Chui, Lloyd and Kwok (2002), in which this idea is presented for the first time using now the three cultural dimensions proposed in Schwartz (1999) in place of the two dimensions proposed in Schwartz (1994).

Keywords: *capital structure, national cultural values, panel data*

1 INTRODUCTION

Shortly after the seminal article of Modigliani and Miller (1958), Durand (1959) wove a series of critiques to the approach employed, whose purpose was to alert researchers to the distance between the proposed model and the reality of the enterprises. Since then, a number of authors have been developing the theory of capital structure in search of the factors capable of explaining the strategies of the enterprises in this field.

Accepting the classification of the models suggested in the work of Terra (2007), we can think about four major model lines: static tradeoff hypothesis, which includes the studies developed by Modigliani and Miler (1963), Miller (1977) and DeAngelo and Masulis (1980), among others; agency cost framework, which includes the studies of Jensen and Meckling (1976), Myers (1977), Myers and Majluf (1984) and Jensen (1986); the signaling framework proposed by Ross (1977); and, the pecking order hypothesis of Myers (1984).

In turn, the theoretical propositions above have motivated empirical research on the capital structure. Several studies were developed, mostly, using data from a single economy, generally the one from the United States of America (USA). Among the most well-known and mentioned, we have: Marsh (1982), Bradley, Jarrel e Kim (1984), Titman and Wessels (1988), Mackie-Mason (1990), Givoly et al. (1992), Graham (1996), Fama and French (1998), among others.

Without locally finding the desired responses, research studies on capital structure have been increasingly addressed at the international level. One of the issues to compose the problem has become: what is the behavior of the models developed in different environments? Several studies have been developed within this framework, such as Kester (1986), Sekely and Collins (1988), Borio (1990), Aggarwal (1991), Rajan and Zingales (1995), Wald (1999), Booth et al. (2001), Chui et al. 2002) and Terra (2007), among others.

However, their results have encountered new questions that need to be answered, in addition to the answers to the problems originally formulated. Unlike the expectations, not only the tax differences, the different conditions imposed to enterprises in bankruptcy condition, the macroeconomic condition of the countries

studied or the security demand in these countries that have determined the differences and similarities between them, even though these had been the initial assumptions of several authors.

The first work to propose the cultural similarities and differences as factors for the capital structure was the work of Stonehill and Stitzel (1969), followed by a hiatus in this matter, whereupon Sekely and Collins (1988), given the result of their research, retake the suggestion of Stonehill and Stitzel (1969). Only in Chui et al. (2002) the possibility of the cultural values of different countries are considered as guiding the capital structure of the enterprises. However, the study does not indicate if the relationship of the national cultural values with the capital structure happens directly or indirectly.

The article exposed herein answers that question: Can the national cultural values influence the capital structure of enterprises? The research base was the study originally formulated by Chui et al. (2002), but using panel data and a series of data corresponding to the entire period in which the Schwartz Value Survey (SVS) was applied.

In the first part, we elaborate the rationale for the study by presenting the research problem, the goal achieved and the structure of the article. In the second part, we perform the theoretical foundation that relates the national cultural values and the capital structure of the enterprises. In the third part, we describe the methodology used in the research, the treatment of the database and the techniques employed in the study. In the fourth part, we analyze the results of the study in panel data, and then the study of the residues of the panel data against the data of cultural values. In the fifth and final part, we elaborate the conclusion of the study.

2 THEORETICAL FOUNDATION

Several international studies have been developed to analyze the feasibility of applying the theoretical formulations of capital structure initially developed in the United States in other countries. In addition to the study of Stonehill and Stitzel (1969), one of the precursors of these studies was Aggarwal (1981). Another initial study on the issue was developed by Kester (1986), who compared American and Japanese enterprises and encountered a significant difference when comparing the indebtedness in accounting values, particularly between the capital-intensive enterprises.

In turn, Sekely and Collins (1988), by studying the relevance and importance of the sectors and countries in the capital structure, found a greater significance in the international difference and a smaller significance in the sectoral difference in the capital structure of enterprises, as well as differences between enterprises of groups of countries composed of similar cultural. The authors also found no significant differences for the internal groups.

Following this line of studies, Borio (1990) identified a significant difference between the countries considered in their study. According to them, the group formed by the USA, United Kingdom and Canada has a smaller debt in relation to the group formed by Japan, Germany and France. For the author, the cultural factors have a more indirect role on the capital structure, influencing the regulations of the capital markets of the countries studied, their legislation regarding reorganization and bankruptcy, and even their taxation.

Another work that can be highlighted is the one developed by Rajan and Zingales (1995); in their study, more than 4,500 non-financial enterprises belonging to G7 (USA, United Kingdom, Canada, Italy, France, Germany and Japan) were analyzed. Despite finding in their study a similarity higher than that expected among the G7 countries, Rajan and Zingales (1995) note that the differences cannot be easily explained by institutional differences.

The article of Booth et al. (2001) advances in the international comparison with a differential in relation to the choice of the sample, as the authors sought a sample of ten emerging countries. The conclusions of the authors include evidence that the determinants of the capital structure in developed countries are relevant to emerging countries and that the host country of the enterprise does not determine more significantly the indebtedness than the set of these indicators. However, the authors point to the fact that the determinants of the capital structure differently influence the level of indebtedness in certain sets of countries.

The next work to conduct an international comparison in the capital structure of enterprises and to consider the variable ‘country of origin of the enterprise’ in the study was the work of Chui et al. (2002). In this study, the authors analyzed the influence of cultural values, in addition to the determinants of the capital structure, using the scale proposed by Schwartz (1994, 1999), named Schwartz Value Survey (SVS). The article of Chui et al. (2002) contributes for the development of the theory of determinants of the capital structure when establishing the theoretical relations so that the national cultural values can be related to the capital structure of the enterprises.

3 RESEARCH METHODOLOGY

We used data from two databases different in purpose: the base known as Compustat Global (Compustat), database organized and maintained by the Standard & Poors, and the base consolidated from several research studies conducted with the methodology of national cultural values, composed by Schwartz (1994, 1999), named Schwartz Value Survey (SVS), and applied between the years of 1988 and 2003. The base extracted from Compustat for this work corresponds to the period of the SVS base. Accounting and market variables were extracted. To do so, we followed the indications for variables of the analyses carried out by Bradley, Jarrel and Kim (1984), Wald (1999), Bouallegui (2006) and by Terra (2007).

Then, two distinct analyses were composed: one prioritizing accounting indicators (CONT) and another with indicators related to the market (MKT). While the first one presents a greater number of cases, given the ease of having accounting data, the second one provides market information that can conceptually increase the accuracy of the analysis.

Treating the variables used, we can identify them according to their purpose in the evaluation of the capital structure. They are variables that measure: size, profitability, tangibility and investment options. In Table 1, we present the sources and the formula used for each of the study variables.

Table 1: Variables used in the models with the accounting and market base

Variables	Sources	CONT formula	MKT formula
Size	Titman and Wessels (1988)	In(Total Assets)	
Profitability	Wald (1999), Carton and Hofer (2006)	Return on Invested Capital (ROIC)	Total Market Value/Capital Employed
Tangibility	Titman and Wessels (1998)	Fixed Assets/Total Assets	
Investment options	Titman and Wessels (1988)	_	Price per cash flow per share

Source: elaborated by the authors.

The operating debt representation was given by the ratio between equity and equity debt odds, in accounting or market values, according to the model studied. Among the various articles that employ and recommend this approach we can highlight Bradley, Jarrel and Kim (1984) and Wald (1999).

We can observe in Table 2 the expected relationship according to the theories of the trade-off and pecking order for the independent variables used and the level of indebtedness (ratio between the equity debt odds and the total capital).

Table 2: Relationship between the parameters and indebtedness

Parameter	Expected sign - Trade-off	Expected sign - Pecking Order
Tangibility	Negative	_
Size	Negative	Positive
Profitability	Negative	Positive
Investment options	_	Positive

Source: Adapted from Wald (1999).

The criteria for the selection of enterprises for the sample were the presence of their country of origin on the SVS research and at least five (5) years of balance sheets in the range sampled. On the SVS base, the selection took place from the identification of countries whose participation in the drafting of the study was significant (both in volume of questionnaires and in temporal dispersion) and that have representation on the Compustat base, with which they were related.

We can observe in Table 3 the indication of the composition of the base between the selected countries, including the number of enterprises studied and the amount of questionnaires employed to compose the average value of the axes that make up the dimensions of the national cultural values in the SVS.

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Table 3: Relation of the countries studied with the respective amounts of enterprises and questionnaires on the Compustat and SVS bases

Country	Enterprises CONT Base	Enterprises MKT Base	SVS Questionnaires
South Africa	89	67	503
Germany	307	238	1491
Australia	398	190	1828.
Belgium	50	37	1115
Brazil	71	49	1776
Canada	288	264	578
Chile	56	49	1225
China	903	80	1006
South Korea	131	113	472
Denmark	76	55	1025
Spain	72	60	939
USA	1475	1378	4012
Philippines	69	59	895
Finland	67	52	6030
France	281	214	5694
Greece	45	40	543
Netherlands	85	76	1196
Hong Kong	63	57	923
India	196	166	301
Indonesia	125	131	206
Italy	110	79	1087
Japan	2498	2208	2014
Malaysia	394	325	763
Norway	42	26	502
New Zealand	35	28	829
United Kingdom	519	463	349
Singapore	195	145	1320
Sweden	91	61	2216
Switzerland	122	92	463
Taiwan	133	117	477
Total	8986	6919	41778

Source: Elaborated by the author.

We calculated two models of panel data for the samples of enterprises. The panel data technique has been widely used as a tool for the study of interrelated phenomena whose relationship is temporally dependent. One of the advantages pointed out by Hsiao (1986) for the technique is the larger number of degrees of freedom and the reduction of collinearity.

The estimation of the models developed was performed as a two-stage regression analysis. As the ratio of the equity on the equity debt odds is not directly observable, the first stage is the performance of a regression analysis described for the static model. In the second stage, the regression-adjusted values are used as a proxy of the ratio of the equity on the equity debt odds in estimating the final equation.

To identify whether we would need to use the data panel with fixed or random effects, we carried out the Hausman specification test (1978), whose null hypothesis is that the individual effects are not correlated with the explanatory variables.

This way, it was open the choice between the two estimators with instrumental variables proposed by Anderson and Hsiao (1982) and that are consistent: the difference (Δy_{it-2}) and level (y_{it-2}). We decided to use the second one since it is usual the use of the level (y_{it-2}) as an instrumental variable in research studies on capital structure

with panel data. The option for the use of instrumental variables in levels is based on Arellano (1989). The author demonstrates that an estimator that uses a difference as instrument suffers from singularities and large variances in view of the different values of ψ. From this demonstration, we can affirm that the estimators that use instrumental variables in levels are preferable to the ones that use differences.

In addition to employing the panel data analysis using conventional indicators, this study includes an extension in that we will test the residues of the previous model against the national cultural value variables provided by the SVS; the model employee will be thus:

$$\varepsilon_{it} = \gamma_i + \beta' z_{it} + \mu_{it} \quad (1)$$

Where i=1,...,N and t=1,...,T, where N is the number of countries and T is the number of periods;

E:

ε_{it} : residues of the previous panel data, totaled per country and year;

z_{it} : average per country and year of the seven variables that compose the dimensions of the SVS;

β' : 7 x 1 vector of constants (b_1, b_2, ..., b_7);

γ_i : Individual effects or a non-observed heterogeneity;

μ_{it} : term of errors (μ_{i1}; μ_{i2};…;μ_{iT}) independent and identically distributed with zero mean and variance σ_μ.

The reason to not use the SVS data directly in the model along with the Compustat base is the limitation of the time continuum that such merging would generate in the total study. Thus, we decided to sacrifice part of the potential conclusions within the base on behalf of the main objective of the study.

Also, in this stage, we employed the two-stage least squares technique for the analysis of the panel data, so that the regression analyzed followed the equation:

$$\varepsilon_{it} - \varepsilon_{it-1} = \psi(\varepsilon_{it-1} - \varepsilon_{it-2}) + \beta'(z_{it} - z_{it-1}) + \varphi_{it} - \varphi_{it-1} \quad (2)$$

This way, we used the same strategy to apply the level of the dependent variable (i of ε_{it-1}) so that we could handle the integrator effect and guarantee better estimates for the parameters. In addition to these improvements, in the second model, the independent variables were selected regarding the statistical significance through the stepwise technique.

To ensure comprehensiveness in the analysis performed, we chose to use an unbalanced panel. This type of approach can be a limiter of the quality of the result of the study (and it can generate survivability and selection bias). However, the use of robust estimation tends to reduce this impact, since extreme values that can be generated by atypical situations (bankruptcy or initial public offering) are smoothed.

4 ANALYSIS OF RESULTS

Table 4: Arellano-Bond autoregression test on multiple regression

Tests	MKT Base	MKT P-value	CONT Base	CONT P-value
Arellano-Bond test for AR(1):	z = 138.88	Pr > z = 0.0000	z = 157.00	Pr > z = 0.0000
Arellano-Bond test for AR(2):	z = 103.25	Pr > z = 0.0000	z = 18.73	Pr > z = 0.0000
Arellano-Bond test for AR(3):	z = 66.02	Pr > z = 0.0000	z = 11.43	Pr > z = 0.0000
Arellano-Bond test for AR(4):	z = 42.84	Pr > z = 0.0000	z = 9.87	Pr > z = 0.0000
Arellano-Bond test for AR(5):	z = 34.67	Pr > z = 0.0000	z = 16.84	Pr > z = 0.0000

Source: elaborated by the author.

We can observe in Table 4 that there is a strong autoregressive component in the panel data; the treatment of this feature came through the application of the model in the panel data according to the technique proposed by Anderson and Hsiao (1982), described above; thus, we decided to apply the Hausman test, according to Table 5.

The autoregression evidence is crucial to choose the panel data study; however, it is through the Hausman test for fixed or random effects that we can determine which methodological procedure among the panel options should be used for a given data sample.

Table 5: Results for the Hausman and Breusch-Pagan test for the MKT and CONT models

MKT Test	Statistics	p-value	Conclusion
Hausman	11382.76	0.0000	Difference in coefficients is not systematic
Breusch-Pagan	5811.27	0.0000	Random effects are significant

CONT Test	Statistics	p-value	Conclusion
Hausman	1975.90	0.0000	Difference in coefficients is not systematic
Breusch-Pagan	1394.25	0.0000	Random effects are significant

Source: Elaborated by the author.

From Table 5, we can identify the non-rejection of the null hypothesis at a 95% confidence level, which lead us to assign fixed effects on the coefficients. We performed both the Hausman test (1978) and the Breush-Pagan Lagrange multiplier test, which evaluates the significance of random effects.

Such findings do not affect the construction by the proposed model of panel data, but points, as seen previously, to a methodology recommended by Anderson and Hsiao (1982) of two-stage least squares (2SLS) using the level as an integrating variable in place of the difference, following the recommendation presented in Arellano (1989).

Additionally, we used the parameter estimation technique known as robust regression to reduce the effect of extreme values in the model. As a positive effect of the use of such estimation technique we have the reduction of the effect of the heteroscedasticity on the estimates performed.

Both the MKT model and the CONT model were significant at the Wald test at 95% confidence. The results for the two models can be seen in Table 6 with their respective significance tests.

Table 6: Parameters estimated for the MKT and CONT models

Variable	MKT Model Coefficients	Statistics	P-value(%)	CONT Model Coefficients	Statistics	P-value(%)
Tangibility	-791.4157	-1.22	0.223	-2270.464	-3.94	0.000
Profitability*	0.0091109	2.64	0.008	0.0157117	0.36	0.721
Size	-111.2016	-2.49	0.013	-177.7378	-4.15	0.000
Options	0.0001064	0.47	0.642	NA	NA	NA

* TMV/CE for the MKT Model or ROIC for the CONT Model
Source: developed by the author.

Analyzing the results of Table 6, we can see that the parameters estimated bring more alignment with the trade-off theory. The main reason may be in the combination of different realities in relation to the capital market development, legislation on enterprises, both regarding the investor's rights and the law on reorganization and bankruptcy, differentiated macroeconomies and a variety of very large sectors. On the other hand, it is natural to expect that the component not explained by these models reflect this diversity, which leads us to the next stage of the analysis.

On the second stage, we analyzed the relationship of the SVS against the residues of the MKT and CONT models, and we obtained the relationship between the metrics proposed by Schwartz (1994, 1999) for the national cultural values and the capital structure. As a resource to improve the identification of variables for the model and avoid collinearity problems among the SVS variables, we decided to use the stepwise variable selection technique, which establishes criteria for the input and output of variables in the model according to pre-established significance levels. For the specific case of this base, we used 5% as the criterion for input and 15% for output. We also chose the robust treatment of residues, which increases the chances of more accurate estimates for the parameters by reducing the effects of possible outliers.

Table 7: Parameters estimated for the CONT and MKT residues with the SVS base

	CONT Model			MKT Model		
Parameter	Coefficients	t	P-value	Coefficients	t	P-value
Conservatism	-392.591	-2.036	0.045	-334.254	-2.931	0.004
Equal Commitment	335.213	1.623	0.108	244.394	2.049	0.044
Hierarchy	-239.725	-1.857	0.067	-103.510	-1.330	0.187
Intellectual and Affective Autonomy	200.083	1.793	0.076	111.355	1.709	0.091

In Table 7, we summarize the parameters obtained for the two models. By adopting the relations between the dimensions of cultural values and the capital structure proposed by Chui et al. (2002) and adapting them to the three dimensions proposed by Schwartz (1999) we have that the first dimension concerns the relationship between societies with conservative features against societies with greater intellectual and affective autonomy. Returning to the proposal, three arguments were presented for this axis: (a) the search for harmonious relationship in conservative countries leading to reduced risk of reorganization and bankruptcy, (b) the importance of public image in conservative countries, and therefore their concern about the risk of reorganization and bankruptcy, and (c) the search for intellectual and affective autonomy in countries that value it can reduce the greed for funding and allow greater freedom of decision.

Analyzing the results in Table 7, we can see that this is one of the dimensions in which two variables have been selected by the stepwise technique. Looking at the sign of the estimated parameters, we can see that the ratio between equity and equity debt odds is smaller in more conservative countries, i.e., there is a higher debt. This argument is in line with argument (c) proposed above, but it is opposed to arguments (a) and (b). On the other hand, we can see by the parameter estimated for the affective autonomy that countries with greater affective autonomy have higher debt, which is in line with (a) and (b), but is, at first, a counterpoint to (c).

One explanation for such an outcome is possible when reflecting about the definition of conservatism and by the fact that this opposes two measures of autonomy, the intellectual and affective ones. Speculating about it, it is possible that there are two "types" of conservatism, a rational one and an affective one. Arguments (a) and (b) are consistent with an emotional conservatism, while (c) is consistent with a rational conservatism. Another indicator that there is an amalgamation of opposing factors is in the low significance of the affective autonomy in both models.

The second dimension addresses the relationship between societies that value hierarchy as opposed to societies that value equal commitment. In this case, two arguments have been proposed: (a) the search to avoid ambiguities in more hierarchical societies leads enterprises to reduce risk and debt, and (b) in more hierarchical societies, the employer and employee relationship is more paternalistic, so the manager's decisions are influenced by the protective image that they want to maintain, leading to reduced risk and debt.

According to Table 7, at least for the model that uses market data, the equal commitment was significant and presented sign in accordance with arguments (a) and (b), i.e., the higher the equal commitment, the lower the ratio between equity and equity debt odds and the higher the debt. It is interesting to note that, although preserved in the model by the stepwise technique, the measure of hierarchy did not show any significance in its parameter for the MKT model, while it presented marginal significance for the CONT model (10% significance confidence).

The third dimension analyzed concerns societies with higher guidance for the control as opposed to harmonic societies. The related arguments concern the tendency on the part of agents in conservative societies of having a locus of control, which leads them to keep a greater decision-making power, and therefore leads to debt reduction. Another argument proposed is that the search for individual success in more controlling societies inhibits indebtedness, since this increases risk and could hinder the creation of an image of success by the managers.

None of the component variables of this dimension were identified as significant in the model; in fact, they were not even selected by the stepwise technique. The fact of not having been selected may indicate that there is collinearity between these and other variables present in previous dimensions.

5 CONCLUSIONS

This article contributes to the understanding of the process of financing enterprises when demonstrating that national cultural values influence the capital structure. We can also see that the decisions of managers are linked

to the values to which they are exposed from birth and, even more so, to the values of those who surround and influence them, since they have certain expectations regarding the pattern of behavior of those who decide the capital structure.

Another question whose answer was obtained is related to the effectiveness of determinant variables of the capital structure that were addressed in this study. The results achieved by the panel analysis allowed us to achieve results compatible with the works that are used as reference in this field, which advocate for the trade-off model. The decision to conduct a study with market data and accounting data in parallel has proved to be a source of greater reliability in the analyses carried out, supporting and enriching the analysis developed.

The relation of the national cultural values with the capital structure was then evaluated based on the residues of the market and accounting models. Such treatment, based on the residues, is identical to that performed by Chui et al. (2002). Three innovations were added in relation to what Chui et al. (2002) used. The first one was the use of the residues of the panel data, the second one was the use of the robust regression, and the third one was the use of the stepwise selection technique.

The first innovation in relation to the study of Chui et al. (2002) aimed to ensure that the results would not be affected by the specificity of the sample used. This change in the approach is in line with previous research studies and is expected to increase the reliability of the results. The second and third changes, the use of robust regression and stepwise technique, aimed to prevent that the high correlation between the indicators of national cultural values would generate collinearity in the estimates of the parameters.

It was evidenced by the results that the main cultural features to influence the capital structure are the ones corresponding to the conservatism - intellectual and affective autonomy axis, followed by the ones corresponding to the hierarchy - equal commitment axis. This result diverges from Chui et al. (2002) because of the use by the authors of the classification of cultural values in two dimensions according to Schwartz (1994), while this study uses three dimensions according to Schwartz (1999); thus, we reach a different outcome by rejecting the significance of features previously included in the second axis of the dimensions of cultural values.

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