

THE ASSOCIATION BETWEEN CORPORATE GOVERNANCE AND PRODUCT DIVERSIFICATION IN BRAZILIAN FIRMS: AN EMPIRICAL STUDY

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Abstract

In this paper we examine the association between product diversification and corporate governance. We add to the pool of current knowledge in three ways. First, we include the effects of strategy on diversification in our model. Second, we eliminate observations that have both good corporate governance and unchanging, high diversification that Anderson et al (2000) attribute to a confounding theory. Third, we use Brazilian data. Using Brazilian companies allows us to see the corporate governance norms, diversification norms, and the existence of a diversification discount in a developing market. We find that there is a positive association between the strength of corporate governance and a company's level of diversification. We also find that the level of corporate governance significantly affects whether a company is highly diversified. Finally, we find that there is a diversification discount for Brazilian companies. However, after controlling for the effect of corporate governance on diversification, we find that highly diversified firms do not have a significantly different Tobin's Q.

Keywords: corporate governance, Brazil, product diversification

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1. Introduction

According to agency theory, the strategic decision to diversify the operations of a company could be initiated by owners' interests or by executives as an attempt to satisfy their personal needs and desires. Several studies, such as Lang and Stulz (1994), Berger and Ofek (1996), and Servaes (1996), suggest that diversified firms have substantially discounted market values compared to the market values of similar companies with more concentrated operations. This diversification discount would seem to indicate that most diversification is undertaken to satisfy management rather than owners.

However, Anderson et al (2000) argue that the association between diversification and discounted market value does not necessarily imply bad corporate governance. Anderson et al posit that the level of diversification could be the result of either of two corporate governance hypotheses. First, diversified firms could have an excellent governance structure that refuses to divest the company of value-reducing segments because the transaction costs associated with the divestiture are greater than the benefits from having concentrated operations. Second, diversification could be the result of an inefficient

governance structure, allowing managers to receive private benefits at the owners' expense. Anderson et al test the two hypotheses and find that poor corporate governance is not associated with diversification in U.S. firms.

The objective of this paper is to empirically study the relationship between corporate governance structures and levels of product diversification, using data from industrial companies listed on the São Paulo Stock Exchange between 1997 and 2001. Specifically, the study examines whether there is a linear association between diversification and corporate governance strength, whether governance structures are significantly different between focused and diversified companies, and if these differences explain any existing diversification discount. In this way we test the results of Anderson et al (2000) on foreign companies.

The results of our analysis reveal that a Brazilian firm's level of diversification is sensitive to the firm's governance structure and that executive profit sharing and corporate disclosure appear to be the drivers in the association. Our analysis also confirms that diversified companies have a significantly lower Tobin's Q than non-diversified firms. However, the significance disappears when corporate governance is

taken into account, indicating that the “diversification discount” may actually be a “corporate governance discount.”

The remainder of the paper is organized as follows: section 2 develops the theory for our hypotheses by discussing Anderson et al and the theory that links corporate strategy and diversification; section 3 explains our methodology, including variable selection and summary statistics; the results of the study are discussed in section 4, and the conclusions are presented in section 5.

2. The Theoretical Links Between Strategy and Diversification

2.1 Anderson et al (2000)

Anderson et al (2000) address the relationship between corporate governance and diversification in U.S. companies. They hypothesize that poor corporate governance leads to over-diversification. They test the hypothesis and find that there is no significant “systematic relation between the decision to diversify and the choice of governance structure.” Anderson et al also present a second reason why firms may be diversified even if the firm has good corporate governance mechanisms. They propose that executives may decide to keep the firm diversified because divesting the unrelated segment would cost the firm more than it would benefit the firm. It is therefore possible, according to Anderson et al, to

have a properly motivated executive team running an over-diversified firm.

This paper builds on Anderson et al. by examining the relationship between diversification and corporate governance. We add to their analysis in three ways: (1) we incorporate the effects of corporate strategy into our model, (2) we attempt to isolate the two diversification theories put forward by Anderson et al, and (3) we use data from a developing market. Our contributions increase the clarity and power of the tests of association between corporate governance and over-diversification, and provide us with new insights into corporate governance norms, diversification practices, and the presence of a diversification discount in an emerging market.

2.2 Strategy and Diversification

Although corporate governance affects diversification decisions, so do other variables. One important influence on diversification, regardless of the corporate governance structure, is the company’s strategy. At any point in the business life cycle, a company might diversify its operations into new industries for one of several reasons (see Table 1). The company may diversify its operations to protect its cash flows from inherent industry-specific risks, to build on cross-product or cross-industry synergies, to reduce costs through vertical or horizontal integration, or to benefit executives at the owners’ expense.

Table 1. Reasons, Incentives, and Resources for Diversification

Reasons to improve strategic competitiveness	Economies of scale Activity sharing Transfer of Competencies Market Power (related diversification) Block competitors through multipoint competition Vertical integration Financial economies (unrelated diversification) Effective allocation of internal capital Business restructuring
Incentives and Resources with Neutral Effects on Strategic Competitiveness	Antitrust regulation Fiscal legislation Poor performance Uncertain future cash flows Reduction in risk for the firm Tangible resources Intangible resources
Administrative Motives (Reduction of value)	Diversification of risk of administrative jobs Increased administrative compensation

Source: Adapted from Hitt, Ireland, and Hoskisson (2002, p. 238)

Some firms, under the guidance of good corporate governance, create a strategy of diversification. Developing the strategy for a diversified company involves the steps summarized in Figure 1.

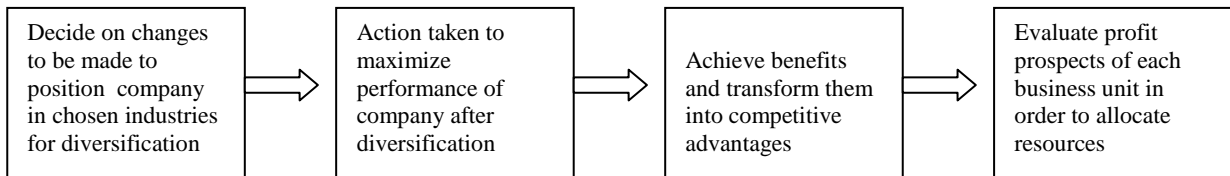
After implementing the planned diversification, each business segment chooses and implements a strategy that will allow it to compete effectively and

achieve above-average returns. If the strategy works out as planned, each business segment should add value to the diversified firm as a whole, creating value from the diversification. In other words, the corporate-level strategy for some companies is to obtain a competitive advantage and increase shareholder value by diversifying into several unique industries (Hitt, Ireland, and Hoskisson, 2002, p. 232).

Because some strategic plans call for diversification, and because diversification of that type is in the best interest of both the company owners and the executives, we want to ensure that the increase in diversification due to the corporate

strategy is not included in the increase in diversification due to poor corporate governance. Accordingly, we add a proxy into our model to account for a company's strategic plans.

Figure 1. The Strategy Development Process for a Diversified Company



Source: Adapted from Thompson and Strickland III (2000).

2.3 Separating the Effects of Different Theories

In addition to addressing the impact of strategy on diversification, we attempt to isolate the effects of each of the two theory proposed by Anderson et al. The first of the two theories is that executives of overly-diversified firms do not divest the overly diversified segments because the divestment is too costly to the company's owners; the second theory is that executives of overly diversified firms are taking advantage of poor corporate governance by effecting the diversification. Executives can initiate personally advantageous diversification for different reasons, including reduced personal employment risk, increased salary (Cannella Jr. and Monroe, 1997), or other personal benefits. By diversifying, an executive can also obtain non-financial benefits such as power, prestige, and social status (Denis, Denis, and Sarin, 1997)¹⁶. In situations where the governing mechanisms are not sufficiently strong to control executives' decisions, the executives can diversify the firm to the point that the company fails to earn average returns (Hoskisson and Turk, 1990).

This study is interested only in the population defined by the second theory, so we assign each observation in our initial sample to one of the two types of populations. Using only the observations from the second population type keeps the results from being muddled and weakened by firms whose behavior is modeled by a different theory. We therefore identify the two population types within our sample and test only the observations related to the second population type. The details of the identification process are included in the methodology section of this paper.

2.4 Hypotheses

Based on the findings of Anderson et al, we expect that—after eliminating the observations related to the first diversification theory—there will be a negative correlation between the strength of a company's corporate governance measures and the same company's diversification level. One important question is whether the correlation is causal or is simply an association. The correlation could be considered causal because there is only one theory supporting the behavior and the window of observation is relatively short. However, the size of the data set reduces the viability of the correlation as a causal relationship. Because of this limitation in our data we treat the correlation as an association with potential causal implications, and that those causal implications should be explored in future research. Therefore, our first hypothesis (**H1**) is that there will be a significantly negative association between the corporate governance variables as a whole and the level of product diversification.

Several studies, such as Lang and Stulz (1994), Berger and Ofek (1996), and Servaes (1996), suggest that diversified firms have substantially discounted market values compared to the market values of similar companies with more concentrated operations. We expect to find the same phenomena in our data, so our second hypothesis (**H2**) is that a firm's market value as measured by the Tobin's Q is smaller for highly diversified firms than it is for not highly diversified firms. We expect that the result will hold after controlling for the effects of corporate governance, but with less statistical impact. The reduced statistical impact indicates that some—but not all—of the drop in Tobin's Q experienced by highly diversified firms is due to the poor corporate governance structure.

¹⁶ According to Anderson et al (2000), prestige and social status are a result of how well the executive is known across different industries. Consequently, managers may diversify to gain recognition, even if the diversification does not add value to the corporation.

Hypothesis	Dependent Variable	Independent Variable(s)	Predicted Sign
H1	Product Diversification	Chairman Independence	-
H1	Product Diversification	Board Independence	-
H1	Product Diversification	Board Size	+
H1	Product Diversification	Ownership Concentration	-
H1	Product Diversification	Profit Sharing	-
H1	Product Diversification	Transparency	-
H1	Product Diversification	All six variables combined	-
H2	Tobin's Q	Product Diversification	-

3. Methodology

3.1 Corporate Governance Variables

Because different companies have different environments and operating goals and structures, there are many possible governance mechanisms through which owners can influence upper-level management. Despite these many possible structures, some variables appear to be consistently good proxies for the strength of a company's corporate governance structure. Ashbaugh, Collins, and LaFond (2004) and Anderson et al (2000) agree that many corporate governance measures in the U.S. fall into three general categories: board structure, ownership structure, and CEO compensation and turnover.

One concern is that the measures used for U.S. corporate governance are not valid for other countries. Leal and Carvalhal-da-Silva (2005) address the problem by creating a corporate governance index for Brazilian companies. The index uses public data to answer 24 questions for each company in the sample. Leal and Carvalhal-da-Silva divide the questions into four categories that somewhat mimic the ones used for U.S. companies. The four categories are board composition and functioning, ethics and conflicts of interest (half of the questions relate to governance malpractice; the rest deal with ownership structure), shareholder rights, and disclosure. Our study combines the measures used by Leal and Carvalhal-da-Silva (2005) and Anderson et al (2000). Similar to Anderson et al, we divide our corporate governance measures into four categories: board structure, ownership structure, CEO compensation, and disclosure¹⁷. In our study, board structure is represented by three variables: chairman independence, board independence, and board size. We use chairman independence as a binary variable to indicate whether the chairman of the board is also a company executive. We estimate the independence of the rest of the board of directors by dividing the number of independent members by the total size of

the board. An independent board member is one who does not simultaneously occupy an executive position within the company. We measure the size of the board by the log of the number of board members.

Ownership structure is represented by a measure of owner power. The variable, which sums the ownership percentages of the top three shareholders and then squares that value, addresses the ability of owners to unite and influence corporate decisions. We represent CEO compensation with a binary variable indicating whether the CEO's compensation plan includes profit sharing. Disclosure is measured by the transparency of the financial statements. Together, the six corporate governance measures listed above are used to represent the corporate governance structures of the companies in our sample.

In this study, the variables are not combined into a single index for the initial regressions. Instead, we leave them as individual variables to see which measures have the most impact on product diversification. To see if corporate governance as a whole is associated with diversification, we run tests of joint significance on all of the corporate governance variables.

3.2 Other Variables

To account for the influence of corporate strategy on a company's level of diversification, we include a strategy variable in our model. The expectation is that including a strategic control variable in the model will allow the impact of corporate governance structures on levels of product diversification to be seen more clearly. Hoskisson, Johnson, and Moesel (1994) propose that relative R&D expenditures and relative debt levels are good proxies for strategic control. We use their suggestion and include the relative level of debt (debt-to-equity ratio) as a control for corporate strategy. Control variables in our model are firm performance (Sales Growth, Return on Assets, and Return on Equity), firm size, company type (dummy variables for foreign and holding companies), and the company's main industry.

3.3 Sample Collection and Summary Statistics

In May 2001, there were 459 companies listed on the São Paulo Stock Exchange, of which 289 had data

¹⁷ The four categories used by Anderson et al are CEO compensation, ownership structure, CEO turnover, and the size of the board of directors. Thus, our modification is the replacement of CEO turnover with disclosure, consistent with Leal and Carvalahl-da-Silva and Ashbaugh, Collins, and LaFond.

available on the *Economática*® database. To develop this study, all manufacturing companies with product diversification data available for at least three of the five years studied (1997 to 2001) are included, resulting in 83 manufacturing companies with open capital. Companies from 13 different industrial

segments (see Table 3) are included in the set. The data were collected from the *Economática*® database and the Annual Report Information (ARI) that companies send annually to the *Comissão de Valores Mobiliários* (CVM). Table 4 provides a summary of the basic statistics for each variable used in the study.

Table 2. Sample Selection Criteria and Number of Resulting Observations

Step	# of Firms	# of Firm Years
Companies listed on Sao Paulo Stock Exchange (May 2001)	459	N/A
Data available on the Economática database	(170)	N/A
Product diversification data for 3 years	(206)	N/A
Observations explained by Anderson et al's alternate theory	(1)	(5)
Final Sample	82	441

Table 3. Occurrence of Participating Companies of the Study by Economic Sector

Sector	Occurrence before selection	Occurrence after
Chemical	?	13
Textile	?	14
Siderurgy and Metallurgy	?	11
Vehicles and Parts	?	7
Food and Drink Sector	?	7
Electronics (or 7)	?	3
Construction (or 3)	?	7
Industrial Machine Sector (or 4)	?	5
Others (or 5)	?	4
Paper and Cellulose	?	6
Mining	?	2
Oil and Gas (or 1)	?	2
Non-metallic Minerals (or 2)	?	1
Total		82

Table 4. Summary Statistics for Total Sample

Variable	Mean	Median	Standard Dev.
Level of Product Diversification	3,069	2,395	3,323
Board Independence	79,921	80,000	15,847
Chairman Independence	0,528	1,000	0,500
Ln (# of Board Members)	1,828	1,792	0,455
Ownership Concentration	4.519,960	4.200,250	2.789,460
Transparency	0,664	1,000	0,473
Profit Sharing	0,599	1,000	0,491
Tobin's Q	0,340	0,329	0,400
Sales Growth	12,227	10,739	34,844
Return on Assets	0,328	1,600	9,329
Return on Equity	(12,837)	3,400	76,874
Debt to Equity Ratio	3,598	1,293	10,719
Ln (Total Assets)	12,881	12,902	1,553
Supplier Concentration	2.502,510	806,681	4.620,610
State-owned Company	0,005	0,000	0,067
Holding Company	0,070	0,000	0,255
Foreign Company	0,070	0,000	0,255
Foreign*Holding	0,009	0,000	0,096
Metallurgy	0,134	0	0,341
Vehicles	0,077	0	0,267
Textile	0,172	0	0,378
Food	0,088	0	0,284
Elec_Constr	0,07	0	0,256
Constr_Elec	0,057	0	0,232
Machine_other	0,07	0	0,256
Mining	0,02	0	0,142
Gas_minerals	0,018	0	0,134
Minerals_gas	0,011	0	0,106
Paper	0,068	0	0,252
other_machine	0,059	0	0,236

** median is reported instead of mean (all other variables are dummies and median is not

3.4 Separating Observations by Level of Diversification

For the purposes of this study, we put each firm-year in one of three diversification levels derived from Rumelt (1974). A firm is classified as not diversified if the revenue generated by the three largest product lines accounts for more than 95% total annual sales.

A low-diversification business generates between 70% and 95% of its total annual sales from its three largest product lines, and a high-diversification business generates less than 70% of its total annual sales from its three largest product lines. In Table 5, we break down the summary statistics by diversification type.

Table 5. Summary Statistics by Diversification Level

Variable	> 30% Diversified (n=292)	5% - 30% Diversified (n=114)	<5% Diversified (n=35)
	Mean	Mean	Mean
Level of Product Diversification**	3,024	1,722	1,043
Board Independence**	82,643	77,777	83,333
Chairman Independence	0,549	0,473	0,529
Ln(# of Board Members)**	1,946	1,792	1,792
Ownership Concentration**	3,928,360	5,000,000	4,217,610
Transparency	0,669	0,679	0,529
Profit Sharing Plan	0,665	0,477	0,441
Tobin's Q**	0,296	0,346	0,459
Sales Growth**	9,900	11,706	13,559
Return on Assets**	1,800	1,400	0,500
Return on Equity**	4,750	1,800	1,150
Debt to Equity**	1,454	1,068	1,098
Ln (Total Assets)**	12,996	12,530	12,298
Supplier Concentration**	672,731	851,556	1,418,190
State-owned Firm	0,000	0,000	0,057
Holding Company	0,056	0,083	0,147
Foreign Company	0,056	0,101	0,088
Foreign*Holding	0,007	0,018	0,000
Metallurgy Industry	0,144	0,105	0,143
Vehicle Industry	0,055	0,096	0,200
Textile Industry	0,185	0,184	0,029
Food Industry	0,106	0,061	0,029
Elec_Constr	0,099	0,018	0,000
Constr_Elec	0,051	0,088	0,000
Machine_other	0,092	0,035	0,000
Mining Industry	0,021	0,026	0,000
Gas_minerals	0,000	0,044	0,086
Minerals_gas	0,010	0,018	0,000
Paper Industry	0,055	0,079	0,143
other_machine	0,045	0,053	0,200

** median is reported instead of mean (all other variables are dummies and median is not as useful).

3.5 Dividing Observations According to Anderson et al's Two Theories

In theory, a firm that has both high diversification and good corporate governance controls will either remain at its current level of diversification or it will become less diversified. However, the company will not become more diversified than it currently is. If the high-diversification, good-governance firms can be identified and removed from the sample, the remaining firms should provide a clearer picture of whether poor corporate governance is associated with high levels of diversification.

To determine which observations belong to Anderson et al's first theory of diversification (the theory that explains consistently high diversification and good corporate governance), we first calculate the complete sample median for each of the six corporate governance variables. We create an index of corporate governance quality by dividing each of the medians by itself and then taking the product of the

quotients. The average corporate governance quality is therefore 1. The index is then calculated for every high-diversification firm, substituting in the firm's values for the numerators in the index. We note which firms have a corporate governance quality index is better than the median (greater than 1). All that is left is to determine which firms do not change diversification levels during the sample period. We take the difference in product diversification between years t and $t-3$, and count any firm as unchanged where the product diversification has not changed by more than $\pm 5\%$. All firm-years of firms with unchanged, high diversification and a corporate governance quality index of more than 1 are labeled as theory 1 observations. Only one of the 83 firms qualifies as a theory 1 firm, minimizing our ability to draw conclusions about the improvement of our sample methodology over Anderson et al. However, we can be confident that the observations in our sample are not explained by the first theory.

4. Empirical Results

Our first hypothesis is that there is a negative association between a company's level of diversification and the strength of its corporate governance. We test H1 by running an OLS regression on the level of diversification. The results show that holding companies tend to be more concentrated than other types of companies, and a few industries have significantly different diversification levels than the holdout industry (Chemical). We also see that profit sharing (t-value: 4.20) and disclosure (t-value: 2.62) are important by themselves in predicting product diversification. Finally, we predicted that all but one of the corporate governance variables would have negative coefficients. In other words, we expected that more of those variables indicated stronger corporate governance and stronger corporate governance minimized high diversification. However, all of the signs are positive except for the

independence of the chairman of the board (see Table 6). The discrepancy between expected and actual signs might mean that more is not better for corporate governance mechanisms.

Because corporate diversification is measured using six different variables, we run two additional procedures to test our hypothesis. We first run an F-test on the three variables used as proxies for the board structure to see whether board structure as a whole is significant. We then run another F-test on all six corporate governance variables. As the results show, board structure is not significant, but the six measures of corporate governance are jointly significant (F-value: 4.36). Their joint significance means we can reject the null hypothesis that corporate governance does not affect product diversification. The OLS results indicate that the main drivers in the association are the existence of a profit sharing plan and transparency.

Table 6. Estimated Parameters for the OLS Regression Model

Independent Variables	Non-Standardized Coefficients		t-stat	p-value	Adjusted R-Square
	B	Standard Error			
(Constant)	0.740	2.328	0.320	0.751	0.196
Chairman Independence	-0.486	0.443	-1.100	0.274	
Board Independence	0.012	0.014	0.820	0.412	
ln (Board Size)	0.095	0.476	0.200	0.841	
Profit Sharing	1.800	0.428	4.200	<.0001	
Ownership Concentration	0.000	0.000	1.560	0.120	
Transparency	1.313	0.501	2.620	0.009	
ln (Total Assets)	-0.091	0.164	-0.560	0.578	
ROA	-0.042	0.027	-1.590	0.113	
ROE	0.002	0.003	0.570	0.566	
Debt to Equity	-0.008	0.017	-0.470	0.641	
Sales Growth	0.002	0.006	0.410	0.681	
Foreign Company	-0.155	0.749	-0.210	0.837	
Holding Company	-1.597	0.736	-2.170	0.031	
Foreign*Holding	1.910	1.977	0.970	0.335	
paper	1.414	0.828	1.710	0.089	
metallurgy	-0.537	0.657	-0.820	0.414	
Vehicles	-1.426	0.852	-1.670	0.095	
textile	-0.118	0.688	-0.170	0.864	
food	5.515	0.745	7.400	<.0001	
Elec_Constr	0.291	0.824	0.350	0.724	
Constr_Elec	0.820	0.932	0.880	0.379	
Machine_other	-0.437	0.792	-0.550	0.582	
other_machine	-0.218	0.864	-0.250	0.801	
mining	0.524	1.212	0.430	0.666	
Gas_minerals	-1.023	1.279	-0.800	0.425	
Minerals_gas	0.587	1.571	0.370	0.709	

n=370

Table 7. F-tests of Corporate Governance Variables (Based on OLS Results in Table 6)

Grouped Constructs (# of variables in group)	F-value	df (num, den)	p-value
Board Composition (3)	0.46	3, 343	0.713
All Corporate Governance (6)	4.36	6, 343	<0.001

We run a second set of tests for the first hypothesis to see if the corporate governance variables have a significant influence on whether a

company is highly diversified. This second set of tests is different from the first set because the first set examines the constant, linear association between

corporate governance and the level of product diversification, while the second set of tests asks if corporate governance significantly affects the likelihood that a company is highly diversified. Another way of asking the question is Are the corporate governance variables significantly different for highly diversified firms than for the rest of the firms?

To test the influence of corporate governance on a company’s likelihood of being highly diversified, we run a probit regression on a binary variable indicating high diversification. We run the model

with all of the same explanatory variables used in the OLS model, and then rerun the probit regression without the board structure variables and again without any of the six corporate governance variables. Using the three resulting log-likelihood values, we compute LR statistics for both the set of board structure variables and the complete set of corporate governance variables. The results indicate that both the board structure ($p < .0001$) and the corporate governance variables ($p < .0001$) are significant in explaining the likelihood of a company being highly diversified.

Table 8. Estimated Parameters for the Probit Regression Model

Independent Variables	Non-Standardized Coefficients		t-stat	p-value	Log Likelihood
	B	Standard Error			
(Constant)	-0.597	1.024	-0.58	0.559	-187.818
Chairman Independence	-0.014	0.196	-0.07	0.942	
Board Independence	0.004	0.006	0.64	0.524	
ln (Board Size)	0.845	0.217	3.9	<.0001	
Profit Sharing	0.428	0.198	2.16	0.031	
Ownership Concentration	0.000	0.000			
Transparency	0.329	0.229	1.44	0.151	
ln (Total Assets)	-0.093	0.073	-1.27	0.204	
ROA	0.006	0.013	0.45	0.651	
ROE	-0.003	0.002	-1.63	0.103	
Debt to Equity	0.000	0.007	0.04	0.965	
Sales Growth	-0.002	0.002	-0.85	0.393	
Foreign Company	-0.470	0.316	-1.49	0.136	
Holding Company	-0.730	0.334	-2.18	0.029	
Foreign*Holding	1.148	0.863	1.33	0.184	
paper	-0.324	0.348	-0.93	0.351	
metallurgy	0.004	0.288	0.01	0.989	
Vehicles	-0.551432	0.360106	-1.53	0.1257	
textile	0.05512	0.310516	0.18	0.8591	
food	0.786582	0.357794	2.2	0.0279	
Elec_Constr	1.330986	0.508139	2.62	0.0088	
Constr_Elec	-0.307289	0.390426	-0.79	0.4312	
Machine_other	0.774261	0.40077	1.93	0.0534	
other_machine	-0.508586	0.357621	-1.42	0.155	
mining	-0.148651	0.519881	-0.29	0.7749	
Gas_minerals	-11.258188	0			
Minerals_gas	-0.295296	0.63364	-0.47	0.6412	

n=370

We then test hypothesis 2 to see if diversified firms suffer from a discounted market value relative to similar, concentrated firms. We run a difference-of means test and find that the Tobin’s Q for highly diversified firms is significantly lower than the Tobin’s Q for the rest of the firms (t-value: 2.44). This result provides preliminary evidence that the diversification discount exists in Brazilian firms.

To see how much of the diversification discount can be attributed to poor corporate governance, we run an OLS regression of Tobin’s Q on the binary variable “diversified,” the corporate governance variables, and the control variables. Because we have previously shown that there is a valid theoretical and empirical association between diversification and corporate governance, we must correct for

endogeneity in the Tobin’s Q OLS regression. To do so, we regress the variable “diversified” on the remaining variables in the Tobin’s Q regression. We keep the residual of “diversified,” or the part of the high-diversification variable that is not explained by corporate governance and the control variables, and use it in place of “diversified” in the OLS Tobin’s Q regression. The results in Table 10 show that after accounting for the effects of corporate governance, being a highly diversified firm does not significantly affect a company’s Tobin’s Q. The results support our hypothesis, showing that although highly diversified firms have lower Tobin’s Q the association is not significant after accounting for corporate governance.

Table 9. Results of Tobin's Q Difference-of-Means Test

	t	df	p-value	Average Difference	Standard Dev.
Tobin's Q	2.44	342	0.015	0.111	0.397

Table 10. Results of Tobin's Q OLS Regression (with Residual of "Diversified")

Independent Variables	Non-Standardized Coefficients		t-stat	p-value	Adjusted R-Square
	B	Standard Error			
(Constant)	-0.530	0.275	-1.930	0.0549	0.289
Residual of Diversified	-0.043	0.046	-0.920	0.3585	
Chairman Independence	0.171	0.051	3.350	0.0009	
Board Independence	0.001	0.002	0.860	0.3922	
ln (Board Size)	-0.096	0.054	-1.780	0.0765	
Profit Sharing	-0.083	0.049	-1.710	0.0877	
Ownership Concentration	0.000	0.000	0.540	0.5894	
Transparency	0.157	0.058	2.730	0.0067	
ln (Total Assets)	0.053	0.019	2.800	0.0054	
ROA	-0.002	0.003	-0.760	0.4492	
ROE	-0.001	0.000	-1.670	0.0951	
Debt to Equity	0.009	0.002	4.730	<.0001	
Sales Growth	0.001	0.001	2.300	0.0221	
Foreign Company	-0.038	0.082	-0.460	0.6446	
Holding Company	0.000	0.076	0.000	0.9983	
Foreign*Holding	-0.033	0.208	-0.160	0.8748	
paper	0.060	0.089	0.670	0.5013	
metallurgy	-0.093	0.071	-1.310	0.1928	
Vehicles	0.220	0.093	2.360	0.0188	
textile	0.087	0.075	1.160	0.2472	
food	-0.076	0.081	-0.930	0.353	
Elec_Constr	-0.206	0.094	-2.180	0.0299	
Constr_Elec	-0.095	0.112	-0.850	0.3977	
Machine_other	0.081	0.087	0.940	0.3502	
other_machine	0.386	0.102	3.790	0.0002	
mining	-0.076	0.125	-0.610	0.5446	
Gas_minerals	0.120	0.141	0.850	0.3941	
Minerals_gas	-0.070	0.162	-0.430	0.6648	

n=311

5. Conclusion

Strategic decisions made by executives are supposed to result in better firm performance. However, executives may incorporate their own personal interest into strategic decisions. One possible result of including personal interests in strategic decisions is the over-diversification of the firm's operations. Effective governance systems should prevent the potential over-diversification by motivating the executives to consider the creation of stockholder value before the executive's personal needs. Thus, companies with effective governance structures should be less prone to high product-diversification.

Our study contributes to current knowledge in three ways. First, simple regression analysis shows that the strength of corporate governance is positively associated with a firm's level of product diversification. Although we expected to find the association, we did not expect it to be positive in sign. The association is driven by a firm's transparency and the use of a profit-sharing plan, and supports the

existence of a causal relationship between corporate governance and diversification. However, our results do not provide conclusive evidence of that causality. Additional analysis shows that the variables of corporate governance, individually and jointly, have a significant impact on whether a company is highly diversified (whether more than 30% of total sales come from outside the three largest product lines).

Second, we control for the theory put forward by Anderson et al that explains why some firms have consistently high diversification and good corporate governance. We cannot comment on the improvement in power or clarity of the tests before and after controlling for Anderson et al's first theory because our sample contained an insufficient number of theory 1 observations, but we can be confident that our results are not confounded by observations described by theory 1.

Third, after confirming the existence of a diversification discount in our sample, we show that much of the diversification discount is actually due to the corporate governance structure. After controlling

for corporate governance, highly diversified firms have lower Tobin's Q values than the remaining firms but the difference is not significant.

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Appendix. Description of Variables Involved in the Study

	Variable	Description	Conceptual
Financial performance variable	SALES_GROWTH	Rate of revenue growth per year, calculated by $[(Sales_{t+1}) - (Sales_t)] / Sales_t \cdot 100$	Bhagat & Black (1999)
	Q	Tobin's Q index, measure of market value of a company is calculated by the relation between the market value of a company and the reposition value of its assets. This indicator reveals the aggregate wealth by the market as an indication of its performance. If Tobin's Q is greater than 1.0, it indicates that the market value of the company exceeds the reposition value of its assets. On the other hand, when Tobin's Q is less than 1.0, the company's liquidation value would not be sufficient to meet the total cost of repositioning the assets of the company.	Chung & Pruitt (1994)
	ROA	Return on total assets in year t. It is expressed by the ratio between company profit and the book value of the total assets in the same period.	Anderson et al. (2000)
	ROE	Return on equity in year t. It is expressed by the ratio between company profit and the book value of its equity in the same period.	Anderson et al. (2000)
	Corporate governance variable	CHAIRMAN_INDEPENDENCE	Dummy variable that expresses the independence of the chairman of the board of directors of a company. The variable = 1 if the chairman of the board of directors doesn't simultaneously occupy a position in executive management (independent) and, it equals zero in the alternative case (non-independent).
BOARD_INDEPENDENCE		Proxy that measures the degree of independence of board of directors. It is expressed by the fraction of the total number of members of the board of directors that are independent, that is, the percentage of the board that don't simultaneously belong to executive management in year t.	Bhagat & Black (2002)
lnBOARD_SIZE		Natural logarithm of the number of members of the board of directors of a company i, in year t.	Bhagat & Black (2002)

	OWNER_PWR	<p>Index of the voting power concentration under control of the three main stockholders. Calculated with the following equation:</p> $HPOD = \sum_{i=1}^3 \left(\frac{P_i}{P} \times 100 \right)^2$ <p>where P_i is the number of common shares of a company i in the control of a determined shareholder, and P represents the total quantity of common shares of the company.</p>	Hoskisson, Johnson & Moesel (1994)
	PROFIT_SHARING	Dummy variable that expresses the profit sharing of the executives in the company. Value = 1 if the executives have profit sharing, and value = 0 in the contrary case.	Volpin (2002)
Dependent Variable	PRODUCT_CONCENTRATION	<p>Index of the realized-sales concentration of the three main product lines of a company i. Calculated with the following equation:</p> $HPROD = \sum_{i=1}^3 \left(\frac{p_i}{p} \times 100 \right)^2$ <p>where p_i is the value of sales within a product line, and p is the total value of sales of a company j in year t. Size of the firm i expressed by the natural logarithm of the total assets of a company in year t.</p>	Anderson et al. (2000) Bhagat & Black (2002)
Control Variables	lnASSETS	Size of the firm i expressed by the natural logarithm of the total assets of a company in year t . Politoic variable that expresses the year of the data of a company i . Value = 1 for 1997; value = 2 for 1998; value = 3 for 1999; value = 4 for 2000; value = 5 for 2001.	Bhagat & Black (2002)
	Debt-to-Equity Ratio	Equal to $(1/ROA - 1/ROE) * ROE$	Hoskisson, Johnson, and Moesel (1994)
	Holding Company	Dummy variable that expresses the type of stockholder control of a company. Value = 1 when a company is a foreign holding, domestic holding, or state-owned holding. Value=0 otherwise.	Volpin (2002)
	Foreign Company	Dummy variable that expresses the type of stockholder control of a company. Value = 1 when a company is a foreign holding or foreign; value = 0 if a company is domestic or state-owned.	Volpin (2002)