

Diversification and control in emerging markets: the case of Chilean Firms

ABSTRACT

This study is the first to analyze the effect on firm value of companies when they participate in the ownership of others companies in an emerging South American economy. For a sample of 83 nonfinancial Chilean companies traded in the 2005–2009 period, we find evidence of a discount when firms participate in the ownership of others companies. However, this discount turns into a premium when this participation in others firm's ownership serves to obtain their control, especially in related sectors. In addition, we find a discount for unrelated corporate diversification similar to that found in previous evidence for several others countries.

RESUMEN

En el presente trabajo se analiza el efecto que tiene sobre el valor de la empresa la participación que tiene una empresa en la propiedad y el control de otras compañías para una economía sudamericana. Para una muestra de 83 empresas cotizadas chilenas en el periodo 2005-2009, nuestros resultados ponen de manifiesto la existencia de un descuento por la participación de una empresa en la propiedad de otras compañías. Sin embargo, dicho descuento se convierte en premio cuando dicha participación le sirve a la empresa para obtener el control de las otras compañías, especialmente en segmentos industriales relacionados. En adición, hemos encontrado un claro descuento por la adopción de estrategias de diversificación no relacionadas.

JEL CODE: G30; G32; G34

Keywords: Emerging Latin-American Markets; Chilean Firms; Unrelated Diversification; Ownership participation; Firm's Value.

Palabras Clave: Economía Emergente Latinoamericana; Empresas Chilenas; Diversificación no relacionada; Participación en la propiedad; Valor de la Empresa.

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1. Introduction

Recent evidence on corporate governance and finance literature shows that the corporate diversification discount¹ is more pronounced among firms in which ownership in hands of managers is low and exist lack of contestability to the control of the largest shareholder by important external *blockholders* (Aggarwal and Samwick 2003; Laeven and Levine 2007). However, these relations could not remain clear if we consider pyramidal ownership structures, which allow excessive control and therefore controlling shareholders are able to enjoy of private benefits. In this context and especially in institutional framework where external investor protection is weak (La Porta et al. 1998; La Porta, Lopez-de-Silanes, and Shleifer 1999), the controlling shareholder can engage in diversification strategies in order of participate in the ownership and control of *others* firms. In so doing, the controlling shareholder will draw a control chain thought pyramidal ownership structures that enable him or her to enjoy a certain level of control benefits and therefore maximize the value of the *base*² company of the chain at the expense of the wealth of minority shareholders of the *others* firms (Claessens, Djankov, and Lang 2000; Faccio and Lang 2002; Ruiz-Mallorquí and Santana-Martín 2009; Laeven and Levine 2008). Prior studies related to the effect of high ownership concentration on the creation of pyramid structures that can be used to wealth have focused on developed markets that are characterized by dominant shareholders control such as Europe and Asia. However, the literature on emerging South American economies is lacking.

¹ Unrelated corporate diversification occurs when firms exploit benefits from industrial business segments that have no relationship with its core segment.

² *Base* company is defined as the firm that invests in the ownership of other companies and *others* firms refers to firms that are far away from the controlling shareholder in the pyramidal control chain.

Our study analyzes the excess value effect of Chilean firms when they invest in the ownership of several other companies (hereafter simply ownership diversification or participation in ownership)³.

We focus on Chilean context due to some specific institutional features that makes an interesting case analysis. First, Chile is an emerging economy shows a clearly bank-oriented corporate system, where banks play an important role in comparison with the capital markets (Fernández, González, and Suárez 2010; Fernández 2005). Even those firms belonging to economic groups or holdings (diversified firms), which despite of having developed internal capital markets, keep a close long-run relation with the banks or own a bank in their economic groups (Majluf et al., 1998). Second, despite of the small size of the *Chilean* capital markets, compared with other South American countries, Chile presents a relatively more developed capital markets, a lower country-risk premium and corruptions levels, and an open and regulated financial markets.

Second, partially explained by the political process at the second middle of the 80s⁴ (Larraín and Vergara 2000; Hachette 2000) and as a natural response of the historical less enforcement of law (Lefort and Walker 2000b; Lefort and González 2008), Chilean firms presents a high ownership concentration, primarily in the hands of individual shareholders or well-diversified conglomerates, that give rise to pyramidal structures (Lefort and González 2008; Lefort and Walker 2000a). Despite the great growth experienced by the capital markets in recent decades, the legal system has not given sufficient protection to the investor to avoid these concentration levels. On the contrary, the Chilean legal system has traditionally operated in a reactive way towards increasing the flexibility of the stock market and the

³ *Ownership diversification or participation in ownership* is defined as the *base* firm participation in the ownership of *other* companies, which are either subsidiaries or affiliates, in both related and unrelated industrial segments.

⁴ This phenomenon was called "Popular Capitalism" where several of the most important firms that actually belong to the IPSA stock market index were part of a privatization process. Some examples of these firms are LAN (now LATAM), COPEC, INFORSA (now CMPC), Bank of Chile, BANK OF SANTIAGO (now Santander's Bank), CTC (now Telefónica Chile), ENERSIS, IANSA, SOQUIMICH (Sociedad Química y Minera or SQM), among others.

protection of existing pension systems administrators (Iglesias 1999-2000). These characteristics are substantially different compared to other developed countries and emerging and developed economies in which the literature has widely shown the existence of a diversification discount (Berger and Ofek 1995; Lang and Stulz 1994; Rajan, Servaes, and Zingales 1998; Lins and Servaes 1999; Campa and Kedia 2002; Hoechle et al. 2012).

Third, in order to improve corporate governance practices, Chilean regulators have recently adopted several capital markets rules as the corporate governance law (Ley N°20.382, 2009), the anonymous societies law modification regarding to transactions with related parties (Ley N° 18.046, 2010), and others normatives with the purpose to improve the informational transparency about corporate board of directors constitution and operation (NCG 341, 2012).

For a sample of 83 nonfinancial companies listed on the Santiago Stock Market from 2005 to 2009, we find evidence of a discount for *ownership* diversification, controlling for endogeneity using the method proposed by Campa and Kedia (2002). However, this discount becomes into a premium when *ownership* diversifications serves to get the control of the *others* firms, especially when they are in a related sector. This positive relationship can be explained by the potential improvements given by the existence of internal capital markets, improvements in management and information systems, or by the existence of private benefits of the control. In this context, a *base* firm's participation in the ownership of *others* companies is an intermediate link in a pyramidal ownership chain and, therefore, in the configuration of interests of the controlling shareholder that indirect benefits to minority shareholders of the base firm. Additionally, we find a discount for unrelated corporate diversification similar to that encountered in other countries.

Our work contributes to the financial literature in three ways. First, this study is the first to analyze the impact of nonrelated diversification on the value of companies in an

emerging South American economy, namely, Chile. Second, our results extend previous works that have analyzed agency problems from high concentrated ownership structures and weaker law investor protection (Lefort and Urzúa 2008; Majluf, Silva, and Paredes 2006; Silva and Majluf 2008). Finally, we suggest certain implications for regulators in terms of supervision and control of companies with pyramidal ownership that give some potential tunneling problems.

The remainder of the article is organized as follows. Section 2 develops the analytical framework, which includes the literature review and hypotheses development. Section 3 provides the description of the study sample and describes the method and variables used in the analysis. Section 4 presents the results. Finally, Section 5 summarizes our main conclusions.

2. Analytical Framework

2.1 Literature Review

Some advantages follow from the adoption of diversification strategies. Tax benefits associate with diversification can improve firm value (Majd and Myers 1987; Berger and Ofek 1995). Diversification strategies also enable the redistribution of funds between sectors and promote the generation of internal capital markets (Servaes 1996; Campa and Kedia 2002; Kuppuswamy and Villalonga 2010), which can mitigate asymmetric information problems between industrial sectors and improve efficiency.⁵ In addition, unrelated diversification allows firms to reduce cash flow volatility, which potentially facilitate the access to external capital (Becerra 2009; Kuppuswamy and Villalonga 2010; Berger and Ofek 1995), access to foreign markets and efficiency in the resources allocation (Shleifer and Vishny 1992). Thus, diversification also allow firms to invest in marginally profitable projects (Fluck and Lynch 1999), to transfer knowledge between business units (Humphery-

⁵ However, Aivazian, Qiu, and Rahaman (2011) question the efficiency of internal capital markets due to higher propensity to engage in managerial discretion in highly diversified firms (as compared to capital markets), which can lead to agency problems.

Jenner 2010; Becerra 2009), to implement some organizational improvements (Matsusaka 2001), and to take advantage of potential generation of synergies and economies of scope (Lang and Stulz 1994; Gomes and Livdan 2004; Becerra 2009).

On the other hand, if diversification strategies lead to excessive discretionary behavior by firm's controlling shareholder, a diversification discount may result (Becerra 2009; Lang and Stulz 1994; Berger and Ofek 1995). This discount may be explained, among other things, by inefficient resources allocation from more productive to poorest segments (Berger and Ofek 1995; Servaes 1996), overinvestment in business segments that have lower investment opportunities (Campa and Kedia 2002), and the organizational complexity that can cause operational inefficiencies (Klein and Lein 2009; Klein and Saidenberg 2010). Additionally, companies that adopt diversification strategies (i.e., conglomerates) may operate in internal capital markets to facilitate the transfer of cash flows between industrial segments (Rajan, Servaes, and Zingales 2000; Ozbas and Scharfstein 2010), which in turn can lead to inefficient resource allocation because some *unit* belonging to the Business Group will be overfunded (underfunded) relative to the external capital market access of the same *unit* (Baker 1992; Hoechle et al. 2012). Other studies have shown that the diversification discount reflects the large shareholder's incentives to maximize private benefits (Jensen 1986; Morck, Shleifer, and Vishny 1990), and the maintain higher levels of asymmetric information (Stein 1997; Fluck and Lynch 1999; Hadlock, Ryngaert, and Thomas 2001).

While most empirical evidence has shown the existence of a diversification discount, recent studies argue that the discount can be the result of a model misspecification. Campa and Kedia (2002) and Villalonga (2004b) suggest that companies may choose to diversify in response to changes exogenous to the economic environment of the company. Therefore, the diversification discount result from not considering the potential endogeneity problems related to the decision to diversify. Similarly, Campa and Kedia (2002) find that the

diversification discount is attenuated and sometimes even disappears after controlling for endogeneity.⁶

In short, no consensus exists in the literature that supports a conclusive argument for the existence of a diversification discount (Lang and Stulz 1994; Rajan, Servaes, and Zingales 2000; Whited 2001; Lamont and Polk 2002). Whether a diversification discount occurs and whether the reason for the discount is related to agency problems or lies in the corporate governance structure of the firm is an issue that is still under debate (Jiraporn, Sang-Kim, and Davidson III 2008), especially in emerging Latin American economies that have a high ownership concentration and a low level of legal protection for minority shareholders.

Although both strategies (business diversification and ownership diversification) are corporate diversification strategies, we propose that ownership diversification overlaps with the goal of generating pyramidal structures that allows controlling shareholders to enjoy private benefits of control at expense of the interest of minority shareholders that belong to the furthest firm of the pyramidal control chain.

On the other hand Chilean context presents a French civil-law system characterized by a weaker legal protection of investors and creditors (La Porta, Lopez-de-Silanes, and Shleifer 1999; Lefort and Walker 2000b; Demirgüç-Kunt and Maksimovic 2002; Lefort and González 2008). In response to this fact, over the last 20 years Chilean companies have experienced a high degree of ownership concentration⁷ (Lefort and Walker 2000b; Espinosa 2009), mainly in hands of individual shareholders or well-diversified business groups. This concentrated ownership has given rise to pyramid structures that allow excess of control rights (Lefort and González 2008; Lefort and Walker 2000b). Consequently, approximately

⁶ Other studies, such as Hoechle et al. (2012), find that, after controlling for endogeneity, the diversification discount is reduced when the models are controlled by corporate governance variables.

68% of nonfinancial companies listed on the Santiago Stock Market are controlled by an economic group, pyramidal structures are used in about one-third of the listed companies and a common feature is the separation between voting rights and cash flow rights (Majluf et al. 1998; Lefort and Walker 2000b, 2007).

2.3 Hypothesis

Empirical evidence on the existence of a diversification discount in emerging markets is scarce and inconclusive. On the one hand, some studies report that diversification destroys firm value in emerging economies (Chen and Kim 2000; Lins and Servaes 2002). On the other hand, some evidence shows that diversification strategies add value as in the cases of India and East Asia (Khanna and Palepu 2000b; Claessens et al. 1999) where conglomerate affiliation creates value for diversified firms as a way to overcome institutional and market imperfections. However, recent evidence shows that Khanna and Palepu (2000b) results are not robust and contradict the view that the performance of the group's subsidiaries improves with increasing diversification of the group (Lensink and van-der-Molen 2010). Thus, the diversification discount is still under debate (Jiraporn, Sang-Kim, and Davidson III 2008). In addition, studies on emerging markets have focused on Asia (Khanna and Palepu 2000b; Claessens et al. 1999; Lins and Servaes 2002; Lensink and van-der-Molen 2010) and Europe (Faccio and Lang 2002), and very little is known about how corporate diversification affects firm value in the emerging markets of South America.⁸ Thus, because don't exists conclusive evidence for an emerging economy like Chile's, the expected effect of the diversification discount on Chilean companies is an empirical question. Therefore, our first hypothesis is stated as follows:

⁸ Some previous studies for South America are Khanna and Palepu (2000a) and Khanna, Palepu, and Sinha (2005). However, these studies evaluate the business group's role and their impact on firm value. In some of these cases, diversification is treated as the degree of diversification of the business group and not of the diversification of the firm itself.

Hypothesis 1: Chilean firms present a diversification discount for unrelated diversification strategies.

On the other hand, diversification strategies could be explained by ultimate controlling shareholder's incentives to achieve excess of control rights of the others companies in order to increase the private benefits of control. In Chilean firms the excess of control rights is achieved by business groups or conglomerates, which are characterized by pyramidal ownership structures (Lefort and Walker 2000b).⁹ Corporate governance literature suggests that private benefits of control allow the controlling shareholder to adopt strategies that maximize the value of the nearest (*base*) company of the control chain at the expense of the value of the *other* firms (Claessens, Djankov, and Lang 2000; Faccio and Lang 2002; Ruiz-Mallorquí and Santana-Martín 2009; Laeven and Levine 2008). In the same vein, international evidence shows the existence of two opportunistic major pathways on pyramidal ownership structures: the tunneling effect, defined as the transfer of resources and earnings (Johnson et al. 2000), and the installation of relatives in chair positions in these *others* firms (Burkhart, Panunzi, and Shleifer 2003). Additionally, the evidence suggests that these types of effects are mainly observed in countries with civil law, such as Chile. For example, La Porta, Lopez-de-Silanes, and Shleifer (1999) find that diversified pyramidal structures are the most common method for obtaining private control benefits. Claessens, Djankov, and Lang (2000) and Lins (2003) find results for East Asia and 18 countries with emerging markets, respectively. According to these arguments, we formulate our second hypothesis:

Hypothesis 2: Chilean firms present a premium for *ownership diversification* when the *base* firm has higher levels of control of the other firms.

⁹ In Chile, cross-participation at the ownership level is forbidden by law.

3. Sample, variables and method

3.1 Sample

The sample includes 83 nonfinancial Chilean companies listed on the Santiago Stock Exchange between 2005 and 2009, totaling 265 observations. We draw our sample from two main information sources. We obtain data from financial statements (balance sheet and income and expenditures statement) and the market value of the firms from the Datastream database (Thomson One). The information on the ownership structure and both unrelated diversification and ownership participation of other companies comes from a hand collected process of several information sources (Annual Reports, SVS reports, among others). This last source of information is the most restrictive in terms of limiting the size of our sample. Thus, because our dependent “excess value” variable is estimate with “imputed values”, to deal with this problem we use an auxiliary sample composed of 151 nonfinancial firms and 753 observations for the 2005–2009 period. Table 1 provides a detailed description of the sample (auxiliary sample) including the number of firms and observations by year-sector.

Table 1. Sample composition by year-sector

	2005	2006	2007	2008	2009	Total
Agric	2 (8)	3 (8)	2 (8)	2 (8)	2 (8)	11 (40)
Food	2 (17)	3 (17)	5 (17)	5 (18)	5 (18)	20 (87)
Commerce	6 (13)	11 (13)	10 (13)	11 (13)	9 (13)	47 (65)
Real estate	4 (9)	4 (9)	4 (9)	4 (9)	3 (9)	19 (45)
Cem/Const	2 (12)	3 (12)	3 (12)	4 (12)	5 (12)	17 (60)
Tran/Com	3 (14)	5 (14)	5 (14)	5 (14)	3 (14)	21 (70)
Textile/Lumber	1 (9)	2 (9)	2 (9)	2 (9)	2 (10)	9 (46)
Energy/Chem	5 (23)	9 (23)	7 (23)	8 (23)	3 (23)	32 (115)
Min Siderurg	2 (7)	3 (7)	3 (7)	3 (7)	2 (7)	13 (35)
Metal Mechanical	2 (11)	2 (11)	3 (11)	2 (11)	2 (11)	11 (55)
Service	10 (27)	18 (27)	14 (27)	13 (27)	10 (27)	65 (135)
Total	39 (150)	63 (150)	58 (150)	59 (151)	46 (151)	265 (753)

3.2 Variables

3.2.1. Excess value and value measures

On the one hand, to compute the existence of a non-related diversification discount we use the measure of excess value proposed by Berger and Ofek (1995), which compares the total value of the company in relation to the sum of the imputed values that are assigned to each segment as if each one is an individual single-segment company. Thus, the excess value for a company is determined by

$$\text{Exval}_{i,t} = \text{Log} \left(\frac{\text{MV}_{i,t}}{\text{Imputed Value}_{i,t}} \right) \quad (1)$$

$$\text{Imputed Value}_{i,t} = \sum (\text{SAsset}_{i,t} * \text{Multiplier}), \quad (2)$$

where $\text{Exval}_{i,t}$ is the excess value for firm i in year t ; $\text{MV}_{i,t}$ is the firm's market capitalization (market value of common equity plus book value of debt) for firm i in year t ; and Imputed Value is the sum of the product of segment asset (or sales), SAsset , and the asset (or sales) multiplier, Multiplier . Multiplier is measured as the median total market capitalization to asset (or sales) for the single-segment firms in the same industry in the same year. A positive excess value indicates that the firm is worth more than the sum of its segments whereas a negative excess value implies that the firm as a whole is worth less than the sum of its segments. Thus, a positive excess value implies a diversification premium whereas a negative excess value indicates a diversification discount. When we use multiple assets (multiple sales), the resulting excess value is EXVALASSETS (EXVALSALES).

On the other hand, to test if our results related with *ownership diversification are robust*, we estimate the equation (6) incorporating as a dependent variable the *market-to-book* ratio as a measure of firm's value (Adam and Goyal 2008).

3.2.2. Diversification measures

We measure diversification along three lines: unrelated diversification, diversification into the ownership of other companies, and the potential effect that control over other companies has on firm value. First, to measure unrelated diversification, we use as an initial measurement the Herfindahl index proposed by Hirschman (1964) and modified by Berry (1971), which reflects the absence of concentration of assets (HERFASSETS) and sales (HERFVENT). The higher this variable is, the higher the levels of corporate diversification of the company, either in sales or assets. Similarly, we include a measure of entropy of assets (ENTROASSETS) and sales (ENTROSALES), which considers diversification across different levels of industry aggregation: the higher the value of this measurement, the greater the degree of diversification. To complement these measures, we also employ a number of alternative measures. We incorporate a DIV dummy variable that takes the value 1 when the company is diversified into unrelated sectors, and zero otherwise. NSEC is the number of industry segments in which the company participates.

Second, to measure Ownership diversification, we calculate the Herfindahl index (HERFINV) and the degree of entropy (ENTROINV) of the proposed investments, respectively, as

$$\text{HERFINV} = 1R \sum_{j=1}^{\text{NPART}} P_j^2 \quad (3)$$

$$\text{ENTROINV} = \sum_{j=1}^{\text{NPART}} P_j * \text{Ln} \left(\frac{1}{P_j} \right), \quad (4)$$

where NPART is the number of companies in which the *base* company has ownership, and P_j is the capital invested in ownership of company j over the total capital invested in ownership of other companies. Along with these investment diversification measurements, to control for the possible effect of heterogeneity on the size of the investment portfolios that

each company has available for investment in other companies, we include *LNCAPINV*, which represents the natural logarithm of the total capital invested in ownership in other companies.

Finally, to measure the potential effect that control over other companies has on value, we use *PCONTR*, which represents the proportion of companies that are subsidiaries over the total number of companies in which the company owns a share in ownership; and *CERPT*, which is the number of subsidiaries in related sectors over the total number of companies that owns a share in ownership. Both *PCONTR* and *CERPT* can be variables that approach the first link in a pyramid chain of ownership, where a degree of separation exists between voting rights and cash flow rights. In addition, we incorporate the *DIVINV* dummy variable, which takes the value 1 when the investment portfolio in the ownership of other companies is diversified, and zero otherwise.

3.2.3 Control Variables

Following prior literature, we introduce to our model a number of control variables that potentially affect the generation of value in the company (Berger and Ofek 1995; Campa and Kedia 2002) such as the size of the company (*LNTA*), measured as the natural logarithm of the total assets; the level of debt (*DTTA*), measured as the ratio of total debt over total assets; profitability (*EBITSAL*), calculated as earnings before interest and taxes over sales; and capital spending over sales (*CAPEXSAL*), which represents a proxy of growth opportunities. In addition, we consider some characteristics of the Chilean corporate system. As previously mentioned, Chile is an emerging economy framed within a French civil law system (La Porta, Lopez-de-Silanes, and Shleifer 1999; Lefort and Walker 2000b; Demirgüç-Kunt and Maksimovic 2002; Lefort and González 2008) that has weaker external investor protection than countries in different environments (e.g., the United States) and shows a

marked concentration of ownership whereby business decisions primarily depend on a reference shareholder or controller who has a direct impact on decisions that maximize value. With this in mind, we introduce the control variable P1, which represents the percentage of ownership held by the largest shareholder. Finally, we introduce a set of Industrial dummies variables according to the sector classification given by the Chilean Security Exchange Regulator (DSEC) and a set of year dummy variables (DYEAR).

3.3 Method

To test the effect of corporate diversification and diversification in the ownership of other firms on the value of the firm, we estimate the following models:¹⁰

$$\begin{aligned} \text{Exval}_{it} = & \beta_0 + \beta_1 \cdot \text{Diversification Measure}_{it} + \beta_2 \cdot \text{DIV}_{it} + \\ & \beta_3 \cdot \text{CAPEXSAL}_{it} + \beta_4 \cdot \text{LNTA}_{it} + \beta_5 \cdot \text{DTTA}_{it} + \beta_6 \cdot \\ & \text{EBITSAL}_{it} + \beta_7 \cdot \text{P1}_{it} + \beta_8 \cdot \text{DSEC}_{it} + \beta_9 \cdot \text{DYEAR}_{it} + \varepsilon_{it} \end{aligned} \quad (5)$$

$$\begin{aligned} \text{Exval}_{it} \text{ or } \text{MTB}_{it} = & \beta_0 + \beta_1 \cdot \text{Ownership diversification measure}_{it} + \\ & \beta_2 \cdot \text{DIVINV}_{it} + \beta_3 \cdot \text{LNCAPINV}_{it} + \beta_4 \cdot \text{CAPEXSAL}_{it} + \beta_5 \cdot \\ & \text{LNTA}_{it} + \beta_6 \cdot \text{DTTA}_{it} + \beta_7 \cdot \text{EBITSAL}_{it} + \beta_8 \cdot \text{P1}_{it} + \beta_9 \cdot \\ & \text{DSEC}_{it} + \beta_{10} \cdot \text{DYEAR}_{it} + \varepsilon_{it} \end{aligned} \quad (6)$$

Now, if we consider the fundamental assumption of the model to be that the diversification decision is related to the relative value of the company, we can expect that DIV and DIVINV are correlated with the error term in equations (5) and (6), respectively. As a result, the estimated coefficients β_2 may have some biases arising from the presence of

¹⁰ To check the robustness of our results, we use as dependent variable the market-to-book ratio (Adam and Goyal 2008). We find similar results using the market-to-book ratio as the Excess Value multiples.

endogenous selection problems in the model. A large body of literature highlights the existence of endogenous selection problems in diversification and performance models (Campa and Kedia 2002; Villalonga 2004a; Miller 2006). Therefore, our study employs the Heckman (1979) method to control for problems of endogeneity arising from self-selection of sample bias. Specifically, the two-step Heckman procedure explicitly captures both firm-specific effects and other factors (e.g., macroeconomic factors) that influence the propensity to diversify (Dastidar 2009). According to this method, in the first stage, we first estimate a selection equation as a maximum-likelihood probit model to analyze the propensity to diversify and we calculate the inverse Mills ratio (λ_i). In a second stage, we estimate the corrected regression by a regression of equations (5) and (6), using ordinary least squares to analyze the effects of different diversification variables on the value and excess value.

Heckman's method attenuates the endogeneity bias arising from self-selection (Greene 1999; Wooldridge 2002) and requires that we identify at least one variable that may be significant as a regressor in the selection model (equation 7), although this variable is not significant in the regression equations (equations 5 and 6). In addition, the majority of the regressors in the regression equation must be able to be included in the selection equation. More specifically, according to the method proposed by Campa and Kedia (2002), the probit model used in the first stage of the Heckman regressions assumes that both types of diversification are determined by

$$\begin{aligned} \text{DIV}_{it}^* \text{ or } \text{DIVINV}_{it}^* = & F(\gamma_1 \cdot \text{LNNTA}_{it} + \gamma_2 \cdot \text{EBITSAL}_{it} + \gamma_3 \cdot \text{CAPEXSAL}_{it} + \gamma_4 \cdot \\ & \text{CRECPIB}_{it} + \gamma_5 \cdot \text{PNDIV}_{it} + \gamma_6 \cdot \text{PSDIV}_{it} + \gamma_7 \cdot \text{P1}_{it}) \end{aligned} \quad (7)$$

$$\text{DIV}_{it}(\text{or } \text{DIVINV}_{it}) = 1 \text{ si } \text{DIV}_{it}^*(\text{o } \text{DIVINV}_{it}^*) > 0$$

$$\text{DIV}_{it}(\text{or } \text{DIVINV}_{it}) = 0 \text{ si } \text{DIV}_{it}^*(\text{o } \text{DIVINV}_{it}^*) < 0,$$

where DIV_{it}^* and $DIVINV_{it}^*$ are two unobservable latent variables. In turn, the variables that potentially affect the diversification decision are represented by characteristics of each company (size, profitability, growth opportunities and share in ownership of the largest shareholder). In addition, we introduce a macroeconomic factor, $CRECPIB_{it}$, representing the GDP growth rate for the period. Finally, we include two factors related to the industry: $PNDIV_{it}$, which represents the percentage of companies from the primary industry that are diversified, and $PSDIV_{it}$ which represents the proportion of the sales of the diversified companies.

4. Results

4.1 Descriptive Analysis

Table 2, Panel A, shows the statistical overview of the variables, which excludes observations for which data were lacking and outliers. Panel B shows the means (standard deviations) of the variables segmented by the corporate diversification criteria (*DIV*) and the *t*-statistics estimated for the mean differences analyses, which allows us to examine whether significant differences exist in sales among diversified companies relative to nondiversified companies. Finally, Panel C shows the means (standard deviations) of companies with diversified and nondiversified investment portfolios in ownership of other companies (*DIVINV*) and the estimated *t*-statistics for the mean differences analyses, which allows us to examine whether significant differences exist between the two groups.

Table 2. Mean differences and descriptions according to diversified vs. undiversified criteria

Sample composition and main descriptive statistics. Panel A shows the mean, upper and lower quartiles, and standard deviation of each variable for the total sample. Panel B shows the mean (standard deviation) of each variable segmented according to the diversified and nondiversified criteria in relation to sales and *t*-statistics of each mean difference test for comparisons of each of its variables. Panel C shows the mean (standard deviation) of each variable segmented according to the diversified and nondiversified criteria relative to investment in other companies and the *t*-statistics of each mean difference test for comparisons of each of its variables. ***, **, and * indicate a level of significance of less than 1%, less than 5%, and less than 10%, respectively.

Panel A: Total Sample Description				
Variables	Mean	Stand. Dev.	Minimum	Maximum
EXVALSALES	0.097	0.121	-0.271	0.456
EXVALASSETS	0.034	0.157	-0.622	0.95
HERFSALES	0.118	0.182	0	0.614
ENTROSALES	0.200	0.293	0	1.023
HERFASSETS	0.138	0.200	0	0.661
ENTROASSETS	0.242	0.331	0	1.092
NSEC	1.696	0.933	1	5.00
DIV	0.615	0.415	0	1.00
HERFINV	0.515	0.241	0	0.863
ENTROINV	0.563	0.703	0	3.012
NPART	6.95	3.106	0	11
PCONTR	0.698	0.283	0	1.00
CERTP	0.387	0.351	0	1
LNCAPINV	17.97	4.03	0	25.68
DIVINV	0.747	0.411	0	1
LNTA	26.52	1.693	23.16	32.58
DTTA	0.457	0.169	0.033	0.784
EBITSAL	0.131	0.122	-0.233	0.562
P1	0.404	0.189	0.092	0.911
CAPEXSAL	0.099	0.158	-0.410	0.896
PNDIV	0.425	0.160	0.25	0.812
PSDIV	0.595	0.192	0.290	0.999
CRECPIB	0.037	0.020	-0.015	0.056
Total Obs	265			

Table 2 (continued)**Panel B: Description for corporate diversification**

	<i>Diversified</i>		<i>Nondiversified</i>		<i>Mean difference Diversified vs. Nondiversified</i>
	<i>Mean</i>	<i>S.D.</i>	<i>Mean</i>	<i>S.D.</i>	<i>t-statistic</i>
EXVALSALES	0.083	0.102	0.112	0.129	-1.62*
EXVALASSETS	-0.001	0.294	0.060	0.365	-1.76*
HERFINV	0.545	0.230	0.442	0.275	2.98***
ENTROINV	0.708	0.789	0.514	0.708	1.67*
NPART	7.604	3.190	5.828	3.261	4.10***
PCONTR	0.797	0.219	0.710	0.275	1.85*
CERTP	0.203	0.225	0.503	0.389	-6.75***
LNCAPINV	18.10	5.040	16.58	6.173	1.97**
DIVINV	0.822	0.039	0.671	0.040	2.58***
LNTA	27.01	1.853	26.54	2.407	1.59
DTTA	0.469	0.195	0.477	0.207	1.52
EBITSAL	0.137	0.107	0.126	0.132	0.54
P1	0.391	0.018	0.334	0.176	1.69*
CAPEXSAL	0.102	0.172	0.097	0.147	0.18
Total Obs.	163		102		

Panel C: Description for investment diversification in ownership of other companies

	<i>Diversified</i>		<i>Nondiversified</i>		<i>Mean difference Diversified vs. Nondiversified</i>
	<i>Mean</i>	<i>S.D.</i>	<i>Mean</i>	<i>S.D.</i>	<i>t-statistic</i>
EXVALSALES	-0.081	0.115	-0.150	0.150	3.62***
EXVALASSETS	-0.006	0.359	-0.115	0.326	2.02**
HERFSALES	0.110	0.178	0.053	0.120	2.32**
ENTROSALES	0.189	0.288	0.090	0.192	2.47**
HERFASSETS	0.148	0.206	0.062	0.129	3.03***
ENTROASSETS	0.254	0.335	0.110	0.219	3.10***
DIV	0.467	0.500	0.378	0.452	2.58**
LNTA	26.824	2.207	26.495	2.183	1.00
DTTA	0.464	0.197	0.500	0.213	-1.20
EBITSAL	0.123	0.173	0.095	0.157	1.09
P1	0.371	0.176	0.389	0.246	0.63
CAPEXSAL	0.088	0.256	0.056	0.096	0.92
Total Obs.	198		67		

Regarding diversification measurements, as shown in Panel A of Table 2, approximately 61.5% of companies are diversified in terms of participation in industrial

segments (DIV), which is considerably higher than the results reported by Lins and Servaes (1999) for developed economies (United States, 26%; Germany, 37%; Japan, 41%; United Kingdom, 38%). In general, companies have a low level of participation in other sectors, with an average of about 1.7 sectors, and therefore the degree of absence of concentration in sales and assets is significantly reduced. With respect to diversification in the ownership of other companies, 74% of companies are diversified, participating on average in ownership of 6.95 companies. In 69.8% of cases they have control, especially in companies from related industry segments, with an average of 38.7%. These results show that, on the one hand, companies tend to diversify their ownership of other companies to form conglomerates and that the degree of control over these companies is essential. On the other hand, these conglomerates have low sectoral diversification in most cases.

Panel B of Table 2 shows that companies in diversified sales have a lower excess value in assets and sales, which is in line with arguments supporting the existence of a discount for diversification (Campa and Kedia, 2002). In turn, diversified firms exhibit on average a higher degree of diversification in ownership of other companies and also have shares in and control a larger number of companies. Thus, not surprisingly, they have higher values for lack of concentration in the investment portfolio in other companies.

Regarding diversification in the ownership of other companies, Panel C of Table 2 shows that, in general, companies diversified in ownership of other companies have a higher excess value in both multiples. This result may indicate the influence that the majority shareholder exerts on the company; namely, the majority shareholder influences the company to adopt strategies of diversification in the ownership of other companies and in their control to establish a pyramidal control structure that allows the majority shareholder to enjoy certain levels of private control benefits (Claessens, Djankov, and Lang 2000).

In Table 3, we split the sample into thirds based on our dependent variable (EXVALVENT and EXVALASSETS), and we conduct a mean's difference analysis to compare the upper and lower portion of the segmented sample. Panels A and B show that the measurements of unrelated diversification (HERFVENT, ENTROVENT, HERFASSETS, ENTROASSETS, and NSEC) are higher in the lowest third, suggesting the existence of a clear discount in value by adopting such strategies.

Table 3. Means difference of Excess value thirds.

Means of each group and mean difference *t*-statistic. ***, **, and * indicate confidence levels greater than 99%, ** 95% and * 90%, respectively. *EXVALASSETS* and *EXVALSALES* represent excess value measurements estimated based on sales and assets multiples, respectively.

	<i>Upper tertile</i>		<i>Lower tertile</i>		<i>Mean Difference Upper tertile vs. Lower tertile</i>
	<i>Mean</i>	<i>t-stat</i>	<i>Mean</i>	<i>t-stat</i>	
HERFSALES	0.088	0.152	0.154	0.261	-1.918*
ENTROSALES	0.156	0.252	0.264	0.432	-1.917*
HERFASSETS	0.116	0.178	0.182	0.267	-1.793*
ENTROASSETS	0.198	0.294	0.302	0.416	-1.810*
NSEC	1.595	0.863	1.867	0.997	-1.832***
HERFINV	0.445	0.271	0.515	0.257	-1.659*
ENTROINV	0.445	0.607	0.639	0.795	-1.719**
NPART	6.578	3.434	6.027	3.326	0.999
PCONTR	0.757	0.282	0.621	0.254	3.100***
CERPT	0.512	0.490	0.375	0.345	2.414**
LNCAPINV	19.926	6.183	17.124	5.778	2.930***
P1	0.347	0.223	0.416	0.192	2.096**
Total Obs.	89		89		

Panel B: Mean difference segmented by excess value tertile using assets multiples					
	<i>Upper tertile</i>		<i>Lower tertile</i>		<i>Mean Difference Upper tertile vs. Lower tertile</i>
	<i>Mean</i>	<i>t-stat</i>	<i>Mean</i>	<i>t-stat</i>	<i>t-statistic</i>
HERFSALES	0.068	0.149	0.109	0.173	-1.818*
ENTROSALES	0.122	0.248	0.184	0.278	-1.681*
HERFASSETS	0.074	0.141	0.142	0.213	-2.313**
ENTROASSETS	0.134	0.237	0.243	0.349	-2.256**
NSEC	1.506	0.748	1.864	1.039	-2.717***
HERFINV	0.439	0.276	0.509	0.240	-1.773*
ENTROINV	0.420	0.580	0.716	0.718	-2.805***
NPART	7.532	3.135	6.102	3.395	3.068***
PCONTR	0.785	0.253	0.609	0.275	4.708***
CERPT	0.474	0.430	0.381	0.390	1.656*
LNCAPINV	18.884	3.970	16.818	6.544	2.567**
P1	0.360	0.177	0.421	0.233	1.804*
Total Obs.	89		89		

When analyzing the ownership participation, in both Panels A and B of Table 3, our diversification measurements (HERFINV and ENTROINV) have higher levels in the lowest third, which implies that very diversified investments have a value discount. However, measurements related to the number of companies and control over other companies (NPART, PCONTR, and CERPT) have higher levels in the highest third, indicating the existence of a premium in value. In sum, although investment portfolios in other companies produce a discount in value, control emerges as a factor that can replace this discount. This finding sheds some light on the existence of private benefits given by control of businesses in an ownership chain.

4.2 Explanatory analysis

4.2.1. Estimating selection equations: Probit estimates

The first stage of analysis is the probit estimation of the selection equation (7), which analyzes the propensity of companies to establish unrelated corporate diversification

strategies and to diversify into the ownership of other companies. Based on Campa and Kedia (2002), we posit that the character of the business, a macroeconomic factor, and industry factors lead to the decisions of both types of diversification.

Table 4 shows the estimation results of the selection models. Column 1 and 2 show the results of equation (7), where the dependent variable is the unrelated corporate diversification decision (DIV) and the decision to diversify the investment portfolio of ownership of other companies, respectively. Overall, both estimated models have a goodness of fit approximated by a pseudo- R^2 whose values for Models 1 and 2 are 0.1967 and 0.2149, respectively. As expected, larger firms have a greater propensity to diversify into productive segments and other companies. In turn, the main shareholder's ownership (P1) has a positive effect on the propensity to diversify into ownership of other companies, which is in line with the argument that controlling shareholders tend to create pyramid structures to seek private control benefits.

With respect to industrial variables, PSDIV and PNDIV are significant for both types of diversification, and firms show a greater propensity to diversify when a greater proportion of companies are diversified in the base industry, which is in line with the results obtained by Santalo and Becerra (2008) for Spain. They show that diversification may confer competitive advantages in industries in which diversified firms have a large fraction of the market shares. Similarly, in line with Campa and Kedia (2002), our macroeconomic condition variable lacks significance when explaining both types of diversification.

Table 4. Probit estimation

Estimated coefficients [z-statistic] of the estimates of equation (7) via a probabilistic model, as the first stage of the Heckman procedure. The dependent variables are unrelated diversification (DIV) and the diversification in investment (DIVINV). The independent variables are a set of variables that characterize the company. We controlled for the macroeconomic factor and a number of factors characteristic of the industry. ***, **, and * indicate a level of significance for a two-tailed test of less than 1%, less than 5%, and less than 10%, respectively.

	(1) DIV	(2) DIVINV
Constant	-1.993*** [-4.13]	-1.809* [-1.66]
Company Characteristics		
LNTA	0.261*** [3.44]	-0.120* [1.90]
EBITSAL	-0.617 [0.60]	-0.555 [-0.97]
P1	-0.700 [-1.05]	0.763*** [3.05]
CAPEXSAL	-2.378** [-1.96]	-1.449 [0.39]
Macroeconomic Factor		
CRECPIB	2.145 [0.83]	-3.129 [-1.08]
Industry Characteristics		
PNDIV	3.098** [2.00]	-2.005* [-1.77]
PSDIV	0.758* [1.81]	2.761** [2.16]
Industry Effect	SI	SI
Temporal Effect	SI	SI
No. Obs.	265	265
Log Likelihood	-84.94	-82.51
LR chi ² (17)	41.59***	46.73***
Pseudo R ²	0.1967	0.2149

4.2.2. Models Estimation

Table 5 shows the results of the estimations of equation (5), which analyzes the effect of the unrelated diversification strategies on excess value, and Table 6 shows the results of the estimations of equation (6), which analyzes the effect ownership diversification. In both tables, the dependent variables in Panels A and B are the estimated excess value based on sales multiples (EXVALSALES) and the estimated excess value based on asset multiples (EXVALASSETS), respectively.

Table 5. Corporate diversification and excess value

Estimated coefficients [z-statistic] of the estimates of equation (5) of ordinary least squares as the second stage of the Heckman procedure. In Panel A the dependent variable is excess value estimated by sales multiples (EXVALSALES), and the explanatory variables are HERFSALES and ENTROSALES as measurements of lack of concentration of sales. In Panel B the dependent variable is the excess value estimated by assets multiples (EXVALASSETS), and the explanatory variables are HERFASSETS and ENTROASSETS as measurements of lack of concentration of assets. Other explanatory variables common to both panels are NSEC, which is defined as the number of productive sectors in which the company participates; capital expenditures over sales (CAPEXSAL); the natural logarithm of total assets (LNTA); debt over total assets (DTTA); earnings before interest and taxes over sales (EBITSAL); and P1, which is the share in ownership of the largest shareholder. Lambda (λ) represents the inverse Mills ratio estimated in the first stage of the selection model. We control for temporal and sectoral effects. Wald Chi² is the joint significance test of the coefficients. ***, **, and * indicate a level of significance for a two-tailed test of less than 1%, less than 5% and less than 10%, respectively.

Panel A: Excess value using sales multiples (EXVALSALES)			
<i>Dependent Variable</i>	(1)	(2)	(3)
Constant	0.846 [0.78]	0.879 [0.82]	0.957 [0.70]
HERFSALES	-0.123*** [-3.27]		
ENTROSALES		-0.095*** [-3.37]	
NSEC			-0.111*** [-3.27]
CAPEXSAL	0.122 [1.11]	0.129 [1.18]	0.184 [1.01]
LNTA	-0.031 [-1.03]	-0.032 [-1.06]	-0.042 [-0.96]
DTTA	-0.360*** [-3.77]	-0.359*** [-3.78]	-0.366*** [-3.69]
EBITSAL	0.228** [1.98]	0.225* [1.95]	0.254* [1.87]
P1	0.017** [2.14]	0.017** [2.23]	0.020** [2.15]
Lambda(λ)	0.040** [2.18]	0.044** [2.20]	0.067** [2.49]
Sectoral Effect	SI	SI	SI
Temporal Effect	SI	SI	SI
No. Obs.	265	265	265
Wald Chi ²	147.99***	140.65***	145.05***

Table 5 (continued)

Panel B: Excess value using assets multiples (EXVALASSETS)			
<i>Dependent Variable</i>	(1)	(2)	(3)
Constant	0.460 [0.51]	0.332 [0.34]	0.434 [0.72]
HERFASSETS	-0.131 ^{**} [-1.96]		
ENTROASSETS		-0.089 ^{***} [-2.16]	
NSEC			-0.124 ^{**} [-2.10]
CAPEXSAL	0.119 [1.31]	0.111 [1.12]	0.124 [1.43]
LNTA	-0.017 [-0.66]	-0.013 [-0.48]	-0.021 [-0.85]
DTTA	-0.246 ^{***} [-3.16]	-0.253 ^{***} [-3.30]	-0.260 ^{***} [-3.14]
EBITSAL	0.020 ^{**} [2.19]	0.014 ^{**} [2.13]	0.027 ^{**} [1.98]
P1	0.158 [*] [1.92]	0.161 [*] [1.74]	0.160 [*] [1.80]
Lambda(λ)	0.067 ^{**} [2.36]	0.050 ^{**} [2.46]	0.045 ^{**} [2.25]
Sectoral Effect	SI	SI	SI
Temporal Effect	SI	SI	SI
No. Obs.	265	265	265
Wald Chi ²	139.75 ^{***}	133.15 ^{***}	138.59 ^{***}

Columns 1 and 2 of Table 5, Panels A and B, show a clear negative relation between the degree of diversification in sales and in assets and our measurements of excess value estimated by sales and assets multiples, respectively. In addition, column 3 shows that participation in productive segments (NSEC) adversely affects both excess value measurements. These results thus support our first hypothesis.

Consistent with previous studies (Berger and Ofek 1995), our results show the existence of a diversification discount relative to the value of companies in the same sector, whose average value is 11.25% (10.96% for the case of sales multiples; 11.4% in the case of assets multiples), which is relatively lower than the 14% reported by Berger and Ofek (1995)

for the United States case and the results reported by Lins and Servaes (1999, 2002) for developed countries and emerging Asian markets.

According to some arguments, the existence of a diversification discount broadly suggests that the market tends to react favorably to increases in the concentration of business (Lang and Stulz 1994; Rajan, Servaes, and Zingales 2000; Lamont and Polk 2002). Another plausible explanation is that highly diversified companies tend to invest less in specialization and in research and development as compared to companies that are not diversified. Consequently, diversified companies, despite opening new market shares, have lower levels of growth opportunities in their core activities as compared to undiversified firms (Hyland and Diltz 2002).

Table 6 shows the results of the effect of Ownership diversification. On the one hand, Panels A and B, columns 1 and 2, show a statistically significant negative relation between the degree of diversification in ownership of other companies (HERFINV and ENTROINV) and the excess value for sales and assets multiples, respectively. Higher levels of ownership diversifications tend to destroy value. However, we have to mention that these results should be clarified by the potential effect that control of other companies may have on value, especially when diversification is in related sectors. On fact, Column 4 of both panels shows a positive relation between the proportion in the control of other companies (PCONTR) and firm value. Finally, column 5 shows the existence of firm value when the company participates in the ownership and control of other companies, especially when the other companies are in related sectors (CERPT).

Table 6. Ownership Diversification, value and excess value

Estimated coefficients [z-statistic] of the estimations of equation (6) of ordinary least squares as the second stage of the Heckman procedure. The dependent variables of Panels A and B are the excess value estimated by sales multiples (EXVALSALES) and the excess value estimated by assets multiples (EXVALASSETS), respectively. The explanatory variables are HERFINV and ENTROINV as measurement of lack of concentration in sales, NPART is the number of companies in which the base company has a share in ownership, PCONTR is the proportion of companies that it controls compared to the number of companies in which it has a share in ownership, CERPT is the proportion of companies in the same sector over the total number of companies in which it has a share in ownership, LNCAPINV is the natural logarithm of the size of the portfolio of investments in other companies, capital expenditure over sales (CAPEXSAL), the natural logarithm of total assets (LNTA), debt over total assets (DTTA), earnings before interest and taxes over sales (EBITSAL), and P1 is the ownership of the largest shareholder. Lambda (λ) represents the inverse Mills ratio estimated in the first stage selection model. We control for temporal and sectoral effects. Wald Chi² is the joint significance test of the coefficients. ***, **, and * indicate levels of significance for a two-tailed test of less than 1%, less than 5%, and less than 10%, respectively.

Panel A. Excess value estimated by sales multiples (EXVALVENT)				
<i>Dependent Variable</i>	(1)	(2)	(3)	(4)
Constant	0.684 [0.75]	0.629 [0.96]	0.627 [0.76]	0.613 [0.94]
HERFINV	-0.056* [-2.04]			
ENTROINV		-0.044** [-2.22]		
PCONTR			0.062** [2.10]	
CERPT				0.038*** [2.79]
LNCAPINV	0.011*** [2.31]	0.014*** [2.68]	0.014*** [2.68]	0.014*** [2.80]
CAPEXSAL	0.027 [1.15]	0.011 [1.07]	0.010 [1.07]	0.011 [1.09]
LNTA	-0.037 [-0.76]	-0.036 [-0.93]	-0.035 [-0.98]	-0.034 [-1.11]
DTTA	-0.178*** [-3.16]	-0.167*** [-3.26]	-0.166*** [-3.25]	-0.165** [-3.26]
EBITSAL	0.126** [1.93]	0.135** [2.16]	0.135** [2.15]	0.126** [2.19]
P1	0.091** [2.10]	0.071** [2.19]	0.062** [2.29]	0.064** [2.31]
Lambda(λ)	0.157** [2.20]	0.135** [2.23]	0.157** [2.20]	0.104** [2.15]
Sectoral Effect	SI	SI	SI	SI
Temporal Effect	SI	SI	SI	SI
No. Obs.	265	265	265	265
Wald Chi ²	106.49***	111.09***	101.04***	103.20***

Table 6 (continued)

Panel B. Excess value estimated by assets multiples (EXVALASSETS)				
<i>Dependent Variable</i>	(1)	(2)	(3)	(4)
Constant	0.278 [0.62]	0.304 [0.75]	0.414 [0.80]	0.178 [0.85]
HERFINV	-0.031* [-1.78]			
ENTROINV		-0.043*** [-3.57]		
NPART				
PCONTR			0.140*** [3.38]	
CERPT				0.057* [1.88]
LNCAPINV	0.011*** [3.29]	0.012*** [4.02]	0.013*** [4.16]	0.011*** [3.63]
CAPEXSAL	0.069 [1.16]	0.081 [1.51]	0.068 [1.22]	0.073 [1.28]
LNTA	-0.049 [-0.86]	-0.055 [-0.77]	-0.054 [-0.81]	-0.049 [-0.80]
DTTA	-0.185*** [-3.83]	-0.162*** [-3.51]	-0.166*** [-3.41]	-0.177*** [-3.74]
EBITSAL	0.034** [2.32]	0.029** [2.01]	0.018** [2.18]	0.035** [2.33]
P1	0.059** [1.97]	0.050** [2.10]	0.077** [2.38]	0.039** [2.09]
Lambda(λ)	0.034** [2.36]	0.041** [2.15]	0.051** [2.24]	0.024** [2.05]
Sectoral Effect	SI	SI	SI	SI
Temporal Effect	SI	SI	SI	SI
No. Obs.	265	265	265	265
Wald Chi ²	110.99***	115.06***	119.40***	111.82***

As we mention in previous sections, we check robustness using an alternative value measure. Following previous literature (Adam and Goyal 2008), we incorporate as an alternative dependent variable the *market-to-book* ratio as a measure of firm's value. Table 7 shows that the results obtained are corroborated when we study the value effect of diversification strategies.

Table 7. Ownership Diversification and firm's value

Estimated coefficients [z-statistic] of the estimations of equation (6) of ordinary least squares as the second stage of the Heckman procedure. The dependent variable is the *market-to-book* ratio. The explanatory variables are HERFINV and ENTROINV as measurement of lack of concentration in sales, NPART is the number of companies in which the base company has a share in ownership, PCONTR is the proportion of companies that it controls compared to the number of companies in which it has a share in ownership, CERPT is the proportion of companies in the same sector over the total number of companies in which it has a share in ownership, LNCAPIINV is the natural logarithm of the size of the portfolio of investments in other companies, CAPEXSAL is the natural logarithm of total assets (INTA), debt over total assets (DTTA), earnings before interest and taxes over sales (EBITSAL), and P1 is the ownership of the largest shareholder. Lambda (λ) represents the inverse Mills ratio estimated in the first stage selection model. We control for temporal and sectoral effects. Wald Chi² is the joint significance test of the coefficients. ***, **, and * indicate levels of significance for a two-tailed test of less than 1%, less than 5%, and less than 10%, respectively.

<i>Dependent Variable</i>	(1)	(2)	(4)	(5)
Constant	2.946*	2.030*	1.910*	1.878*
	[1.93]	[1.75]	[1.75]	[1.70]
HERFINV	-0.056***			
	[-2.73]			
ENTROINV		-0.054**		
		[-2.21]		
PCONTR			0.131*	
			[1.98]	
CERPT				0.194*
				[1.77]
LNCAPIINV	0.017	0.030	0.030	0.037
	[0.45]	[0.72]	[0.75]	[0.93]
CAPEXSAL	-1.306**	-1.121*	-1.119*	-1.178**
	[-2.34]	[-1.82]	[-1.86]	[-2.04]
LNTA	-0.048	-0.050	-0.052	-0.052
	[-0.74]	[-0.69]	[-0.73]	[-0.77]
DTTA	2.316***	2.289***	2.296***	2.293***
	[4.21]	[3.74]	[3.84]	[4.02]
EBITSAL	0.126	0.149	0.123	0.136
	[0.87]	[0.93]	[0.93]	[0.98]
P1	0.484	0.440	0.249	0.235
	[0.83]	[0.72]	[0.42]	[0.39]
Lambda(λ)	-1.086**	-1.197*	-1.166**	-1.126**
	[-2.11]	[-1.72]	[-2.08]	[-2.11]
Sectoral Effect	SI	SI	SI	SI
Temporal Effect	SI	SI	SI	SI
No. Obs.	265	265	265	265
Wald Chi ²	27.82***	25.32***	28.19***	29.86***

5. Conclusions

Our study is the first to analyze the impact of diversification strategies in unrelated companies on the value of these companies in an emerging market named Chile, which is one of the more developed markets of South America.

On the one hand, we find the existence of a discount for ownership diversification strategies. However, the discount becomes a diversification premium when companies have control over the companies in which they participate, especially in related sectors, which is consistent with at least three notions of the effects of diversification. First, prior research shows that related diversification positively affects firm value compared to unrelated diversification, given the existence of specialized and complementary skills and resources, which may be more efficient through the generation of an internal market (Rumelt 1982; Klein and Lein 2009). Second, a large number of controlled companies in the same industry allows the generation of synergies arising from management, finance, information, and development (Tarziján and Rivera 2000). Furthermore, the literature generally recognizes that diversification decisions significantly increase a firm's multimarket contact with other companies, which influences the strategy and diversification of competitors. Finally, recent empirical evidence shows that certain environments have a high degree of concentration of ownership, including Chile (Lefort and Gonzalez 2008). This high concentration of ownership results mainly in a high incidence of business groups (Khanna and Palepu 2000a) where a parent company, through a controlling shareholder, controls a number of companies using pyramidal ownership structures. The literature on corporate control and ownership suggests that these pyramidal structures and the existence of an ultimate owner create a set of agency problems that result in inefficient use of resources and reduced value for companies at the end of the chain of ownership. These companies suffer the most loss of value because separation between voting rights and cash flow rights is largest in these firms (Claessens,

Djankov, and Lang 2000; Faccio and Lang 2002; Ruiz-Mallorquí and Santana-Martín 2009; Ruiz-Mallorquí and Santana-Martín 2011). Our results provide support for these arguments because they show that indirect control of other companies by a parent company has a positive impact on the value of the latter, which demonstrates a high degree of private benefit of control.

On the other hand, in line with previous literature (Berger and Ofek 1995), our results show the existence of a clear discount for unrelated corporate diversification. These results may suggest the market's tendency to react more favorably to increases in concentration of business (Lang and Stulz 1994; Rajan, Servaes, and Zingales 2000; Lamont and Polk 2002).

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