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The effect of the financial crisis on the value of corporate diversification in Spanish firms

El efecto de la crisis financiera en el valor de la diversificación de negocio en las empresas españolas

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This paper examines the impact of the financial crisis on the value of corporate diversification in a civil law country such as Spain. The financial crisis offers a natural research experiment to test the effect of a credit-constrained environment on benefits and costs emerging from internal capital markets. Using a panel of Spanish listed firms over the 1997–2012 period and controlling for endogeneity, we find that the financial crisis negatively moderates the impact of industrial diversification on a firm's value. This result supports the idea that financial constraints are likely to exacerbate agency costs within internal capital markets in civil law countries over financial benefits, due to a weaker protection of investors' rights.

Keywords: corporate diversification; internal capital markets; investors' rights protection; firm value; financial crisis; GMM system estimator

Este trabajo examina el impacto de la crisis financiera en el valor de la diversificación de negocio en un entorno institucional civil law, como es el caso de España. La crisis financiera ofrece un experimento natural para contrastar el efecto de un entorno de restricciones financieras en los beneficios y costes de los mercados de capital internos. Utilizando un panel de empresas españolas cotizadas durante el periodo 1997–2012 y controlando por la endogeneidad, encontramos que la crisis financiera modera negativamente el impacto de la diversificación industrial en el valor de la empresa. Este resultado apoya el argumento de que las restricciones financieras agravan los costes de agencia en los mercados de capital internos en países civil-law por encima de los beneficios ofrecidos, debido a la menor protección de los derechos de los inversores.

Palabras clave: diversificación empresarial; mercados de capital internos; protección de los derechos de los inversores; valor de la empresa; crisis financiera; estimador GMM system

1. Introduction

For decades, the corporate diversification-value relationship has remained an open question in the literature. Most existing research evidence has led to this strategy gaining a bad reputation in terms of value creation for firms. However, how can the abundance of diversifiers observed in real business environments thus be accounted for? Why do so many firms continue to embark on this strategy if it seems to perform so poorly? Despite

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the relevance of this question and the abundant accumulated research on this issue, a controversy-free explanation is yet to be reached. The debate rages on.[1]

Most empirical evidence tends to associate business diversification with a value destruction effect or "diversification discount" (Berger & Ofek, 1995; Hoechle, Schmid, Walter, & Yermack, 2012; Kuppuswamy & Villalonga, 2010; Laeven & Levine, 2007; Lang & Stulz, 1994; Servaes, 1996; Stowe & Xing, 2006). This diversification discount is explained on the grounds that firms cannot implement a diversification which individual investors would not be able to achieve on their own at a lower cost (Amihud & Lev, 1981). From this viewpoint, diversification at the corporate level would become an inefficient strategy, undertaken in response to self-interested behaviour by managers who seek to secure personal benefit from "empire-building" initiatives (such as higher compensation or professional status) and reduce the exposure of their undiversifiable human capital to risk (Aggarwal & Samwick, 2003; Amihud & Lev, 1981). In support of this argument, Denis, Denis, and Sarin (1997) report a negative association between diversification and managerial equity ownership. In a similar line, Lins and Servaes (2002) and Lins (2003) relate the diversification discount in emerging markets to a firm's ownership structure. They find a higher discount in firms where management control rights exceed proportional ownership since minority shareholders can be expropriated more easily. Tying this evidence together, an agency-based explanation for a lower valuation of diversified firms emerges.

In recent years, the literature on corporate diversification has revisited the empirical evidence as a result of methodological concerns such as endogeneity (Campa & Kedia, 2002; Miller, 2004; Villalonga, 2004b), and measurement problems such as divergences in the disaggregation of segment data (Villalonga, 2004a), value biases from the use of book value of debt (Mansi & Reeb, 2002) or changes in segment reporting standards (He, 2009), among others. Some papers have unearthed fresh findings such as a premium (Campa & Kedia, 2002; Villalonga, 2004a), a non-linear relationship (Palich, Cardinal, & Miller, 2000) or even a non-significant relation (Elsas, Hackethal, & Holzhäuser, 2010; Menéndez & Gómez, 2000; Villalonga, 2004b), casting doubt on the prominence of the diversification discount.

Overall, such disparity in research findings highlights the complexity of the diversification-value relationship and calls for the focus of attention to shift from the "average effect" of diversification (Stein, 2003) to a search for certain "moderating factors" which might affect the influence of diversification on a firm's value, causing its benefits–costs balance to change over time and across countries (Chakrabarti, Singh, & Mahmood, 2007; Fauver, Houston, & Naranjo, 2004; Kuppuswamy, Serafeim, & Villalonga, 2012; Lins & Servaes, 1999). Among such factors, one stream of the literature stresses the institutional environment, as it is likely to influence the role played by internal capital markets emerging from diversification, thereby affecting the value of this corporate strategy (Fauver, Houston, & Naranjo, 2003).

Internal capital markets reasoning argues that diversification enables companies to reallocate internal resources across divisions, and the assets of one segment to be used as collateral to access financing for other segments. Diversified firms are seen to benefit from the so-called more-money effect and the smarter-money effect. On the one hand, the more money effect arises from the increase in a firm's debt capacity as a result of combining businesses which are imperfectly correlated (Stein, 2003). Such mechanisms can alleviate underinvestment problems. On the other hand, the smarter money effect assumes that the CEO is more likely to be better informed about the prospects of the businesses within a multidivisional firm. Acting in the shareholders' interest, the CEO may use such high-quality information to pursue value-creating reallocation of resources across divisions

(Stein, 2003). This ability to shift resources between segments through internal capital markets helps diversified firms to avoid costly external financing. However, it also makes unprofitable projects more likely to be accepted, thereby intensifying agency costs derived from overinvestment. The net balance of benefits and costs from internal capital markets is likely to depend on the institutional environment. On the one hand, the financial environment mainly establishes how valuable the financial flexibility from the internal resource allocation between segments will be. On the other, as these internal allocations are subject to managers' discretion, the institutional setting determines the scope of potential agency costs. These institutional influences may partly explain diversification-value outcomes and why they vary across different settings.

Recent literature compares the value of diversification across different institutional contexts and suggests an interaction between this strategy, capital market development and legal systems (Rudolph & Schwetzler, 2013). However, many of these international analyses fail to identify which specific institutional features do in fact influence the value of diversification. Some exceptions are papers such as Kuppuswamy et al. (2012), who explore the efficiency of capital, product and labour markets. Alternatively, certain recent papers take advantage of the information from the natural experiment offered by the current financial crisis to reappraise this type of argument under external financing constraints. Kuppuswamy and Villalonga (2010) document a decrease in the diversification discount for the US during the current financial crisis as a result of the financial benefits accessed through internal capital markets.

Up to now, most research in this line has dealt with common law settings. The present paper seeks to analyse this issue in depth by focusing on the case of a civil law country such as Spain[2] and by examining the moderating effect of external financial restrictions, such as those emerging from the current financial crisis, on the value of diversification. Given the more investor-unfriendly laws in civil law contexts, internal capital markets are likely to carry higher agency costs. In a context of external financial restrictions, we conjecture that these diversification costs will be exacerbated, partly because of the reduced possibility of using external debt. Prior literature has shown that debt and ownership concentration are important disciplines and informational devices in this type of institutional context (Andrés-Alonso, López-Iturriaga, & Rodríguez-Sanz, 2005). The scale of these agency costs is likely to exceed the benefits that emerge from internal capital markets, such as lower transaction costs related to external markets, or avoiding costly external financing. Consequently, we hypothesise that the financial crisis might have a negative impact on diversification value in the Spanish context.

Spain provides an interesting case study for two particular reasons. First, the existence of a limited bond market, which makes Spanish firms more dependent on private debt (De Miguel & Pindado, 2001), and, second, the severity with which the financial crisis has hit the country. Spanish markets have been hit hard by the financial crisis, which has significantly reduced firms' opportunities to raise external capital. We study the value of diversification on an unbalanced panel of 63 Spanish firms comprising 437 firm-year observations during the 1997–2012 period, our sample thus covering pre-crisis and crisis years. We account for the endogeneity linked to diversification by using the GMM system estimator. We control for geographic diversification to correct for the potential omitted variable bias (Bodnar, Tang, & Weintrop, 1999), as both types of diversification simultaneously concur in many firms, making it difficult to disentangle their separate effects (Bodnar et al., 1999; Denis, Denis, & Yost, 2002; Fauver et al., 2004).

The rest of the paper is organised as follows. Section 2 presents the literature review and hypothesis. Section 3 describes the sample and research design of our empirical study.

Section 4 deals with our main empirical findings, and finally Section 5 discusses our results and offers our conclusions.

2. Literature review and hypothesis

Internal capital markets arising from diversification have sparked intensive discussion in the literature. However, a lack of consensus on the net effect of benefits and costs on firms' value is very much in evidence. On the one hand, diversified companies have the option to reallocate funds across divisions, cash flows generated by one division thus financing other divisions in the firm (Erdorf, Hartmann-Wendels, Heinrichs, & Matz, 2013). Doukas and Kan (2008) provide supportive evidence *vis-à-vis* efficient capital allocation from less profitable business segments to more profitable ones in diversifying acquisitions. Internal capital markets not only make up for external credit restrictions (Hovakimian, 2011) but also enable firms to avoid costly external financing to a greater extent than focused firms (Matsusaka & Nanda, 2002). Internal capital markets are expected to mitigate certain market frictions (Kuppuswamy et al., 2012) and information asymmetries (Hubbard & Palia, 1999) related to external finance sources. As a result, Shin and Stulz (1998) argue that diversified firms are able to invest in certain profitable projects that the external market would not otherwise fund.

In contrast, other papers question the efficiency of these internal capital markets (Berger & Ofek, 1995; Lamont & Polk, 2002; Scharfstein & Stein, 2000) due to the higher managerial discretion in multidivisional firms (compared to external markets). From an agency perspective, Scharfstein and Stein (2000) show the "dark side" of internal capital markets which are mainly seen to respond to managers' rent-seeking interest. These agency costs can result in problems such as cross-subsidisation from better to poorer performing segments (Berger & Ofek, 1995; Scharfstein & Stein, 2000), or over-investment in unprofitable segments (Berger & Ofek, 1995). In a similar vein, Rajan, Servaes, and Zingales (2000) find that a low degree of diversity in resources and opportunities across a firm's segments generates investment incentives for divisional managers because they do not differ greatly in their surplus, hence bringing about more efficient resource allocation among divisions.

The balance between the benefits and costs of these internal capital markets is likely to differ across institutional environments (see Table 1). In less developed markets, mitigation of market frictions (Khanna & Palepu, 2000; Kuppuswamy et al., 2012) and asymmetric information costs (Hubbard & Palia, 1999) by internal capital markets gain importance. Supporting this argument, Fauver et al. (2003) report a decrease in the value of diversification as capital markets become increasingly developed. Khanna and

Table 1. Benefits and costs of internal capital markets.

	Institutional environment	
Internal capital market effect	Common law	Civil law
Benefits	Low	High
Costs	Low	High
Greater financial restrictions		
Benefits	Increase	–
Costs	–	Increase

Palepu (2000) see large diversified Indian business groups as substitute structures of the missing intermediating institutions in such an emerging market. Gugler, Peev, and Segalla (2013) offer evidence of a better functioning of these internal markets in firms with parents from countries with high institutional development and subsidiaries from countries with low institutional development.

Not only might the financing benefits offered by internal capital markets differ between these institutional settings as argued earlier, but also the costs are likely to do so to a greater extent. How developed the institutional setting is also establishes the relative power insiders have to use internal capital markets for their own private benefit, even at the expense of shareholders' interests. Civil law countries are seen to offer weaker legal protection to investors compared to common law countries (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998, 2000). Stronger shareholder rights protection in common law countries is likely to alleviate potential agency problems between managers and shareholders, thereby driving efficient investment in said internal capital markets. In contrast, the less investor-protective institutional framework existing in civil law countries intensifies such agency costs. The functioning of internal capital markets thus carries higher costs in this latter case. In sum, internal capital markets are likely to entail higher benefits and higher costs in contexts with a lower degree of development of external capital markets and investor-unfriendly institutional frameworks.

The net balance of these benefits and costs is likely to be influenced by economic cycles, causing instability in the value of diversification over time (Lubatkin & Chatterjee, 1991; Servaes, 1996). In case of external financial constraints, such as those imposed by the current financial crisis, the financial flexibility offered by internal markets may enhance certain benefits such as the "smarter money" and "more money" effects. For the US context, Hovakimian (2011) find that recessions encourage firms to channel scarce resources to divisions with high growth opportunities, thereby increasing internal allocation efficiency. Providing empirical support for these arguments, Kuppuswamy and Villalonga (2010) report that the discount in US conglomerates fell during the 2008–2009 financial crisis as a result of internal capital market benefits.

However, in less protective environments such as civil law countries, benefits may be compensated or even exceeded by agency costs, which become more intense. In environments such as these which offer poorer investor protection, external finance restrictions may weaken the efficiency of certain key corporate governance mechanisms. Among these, debt is seen as both a discipline mechanism to monitor managers (Harris & Raviv, 1991) and a source of information to investors concerning a firm's quality (Harris & Raviv, 1990), thereby contributing to palliate the agency problems between managers and shareholders (Jensen, 1986). In the case of civil law countries, debt's potential to reduce discretionary behaviour becomes particularly importance (Andrés-Alonso, Azofra-Palenzuela, & Rodríguez-Sanz, 2000). External financial constraints thus exacerbate agency costs from internal capital markets as a result of weakening this external supervisory mechanism.[3] As a result, we expect the financial crisis to have a negative effect on the value of diversification in a civil law country such as Spain.

In line with this reasoning, empirical evidence, such as Rudolph and Schwetzler (2013), shows that the positive effect of the financial crisis on the diversification discount is greater in settings offering a higher degree of investor rights protection. They argue that the greater the maturity of capital markets, the more the financial crisis attenuates the industrial diversification discount, since internal capital markets become more valuable in settings in which firms depend on external funding to a larger extent.

Following on from the arguments posited in this section, we hypothesise:

The general external constraints imposed by the financial crisis negatively moderate the value effect of diversification in a context of low shareholder protection (such as in civil law countries).

3. Data and methodology

3.1. Sample selection

Our sample consists of an unbalanced panel sample of Spanish public companies and spans January 1997 to December 2012. We include both active and currently inactive firms to minimise survivorship bias in the sample. Our main source of information is Worldscope, from which we collect annual financial data, business segment data and geographic segment data. This source is supplemented by Datastream to gather stock market data.[4]

Our sample construction is as follows. Consistent with most prior research on diversification value, we exclude firms with any segment in the financial industry[5] (SIC code between 6000 and 6999) and require each firm-year to have information on total capital and segment data. Additionally, firm-year observation must have sales of at least €14.76 million.[6] Finally, our estimation methodology (the generalised method of moments (GMM)) requires available data for at least four consecutive years per company over the entire time period to test for the lack of second-order serial correlation since GMM rests on such an assumption (Arellano & Bond, 1991).

All these selection procedures result in a final sample of 437 firm-year observations corresponding to 63 firms. Table 2 provides descriptive statistics on some financial characteristics for the final data-set. As can be observed, there is a high dispersion in the size of the sample firms, measured either by total assets, total sales or market capitalisation. Moreover, all firms have debt in their capital structure, the minimum total debt in the sample being €1.08 million. Table 3 presents the distribution of the sample by core industry.

3.2. Empirical models and variables

To analyse how the value of corporate diversification is affected by the external capital constraint environment imposed by the financial crisis, we estimate the following model:

$$\begin{aligned} Excess\_equity\_sales_{it} = {} & \alpha + \beta_1 IND_{it} + \beta_2 IND_{it} * CRISIS_t + \beta_3 CRISIS_t + \beta_4 LDTA_{it} \\ & + \beta_5 EBITsales_{it} + \beta_6 CAPEXsales_{it} + \beta_7 LTA_{it} \\ & + \beta_8 dumINDUSTRY_{it} + \beta_9 dumYEAR_{it} + \eta_i + v_{it} \end{aligned}$$

Table 2. General descriptive statistics.

	N	Mean	Median	STD	Min.	Max.
Total assets	437	8614.883	1014.466	20,193.640	55.755	124,082
Total sales	437	5044.960	792.468	11,834.07	29.485	62,837
Market capitalisation	437	5183.940	836.368	12,224.530	1.209	107,296.100
Total debt	437	3367.657	247.888	8863.692	1.079	64,175
EBIT	437	724.378	73.185	1971.073	−1225.534	16,415

Note: This table shows general descriptive statistics of financial variables for the final sample (437 firm-year observations).

Table 3. Distribution of firm-years by sectors (core industry).

Core industry (2-digit SIC code)	Description	Firm-year observations	% Firm-year observations
16	Heavy construction, except building	47	10.76%
48	Communications	36	8.24%
20	Food and kindred products	35	8.01%
28	Chemical and allied products	35	8.01%
49	Electric, gas and sanitary services	30	6.86%
51	Wholesale trade – non-durable goods	29	6.64%
32	Stone, clay and glass products	28	6.41%
33	Primary metal industries	22	5.03%
73	Business services	20	4.58%
26	Paper and allied products	15	3.43%
30	Rubber and miscellaneous plastic products	15	3.43%
56	Apparel and accessory stores	14	3.20%
27	Printing and publishing	13	2.97%
29	Petroleum and coal products	13	2.97%
37	Transportation equipment	12	2.75%
35	Industrial machinery and equipment	11	2.52%
70	Hotels and other lodging places	10	2.29%
80	Health services	9	2.06%
72	Personal services	7	1.60%
13	Oil and gas extraction	6	1.37%
15	General building contractors	6	1.37%
17	Special trade contractors	6	1.37%
36	Electronic and other electrical equipment	5	1.14%
87	Engineering and management services	5	1.14%
38	Instruments and related products	4	0.92%
45	Transportation by air	4	0.92%
Total		437	100.00%

Note: This table presents the number and percentage of firm-year observations by primary division. The final sample comprises 437 firm-year observations (corresponding to 63 firms).

where i identifies each firm, t indicates the year of observation (from 1 to 13), α and β_p are the coefficients to be estimated, η_i is the firm-specific effect and v_{it} is the random disturbance for each observation. Our measure of the value effect of diversification is the excess equity value to sales ratio (Bodnar et al., 1999; Kim & Lyn, 1986), calculated as follows[7]:

$$Excess\_equity\_sales = \frac{market\_value\_common\_equity - book\_value\_common\_equity}{total\_sales}$$

Corporate diversification is captured by the *IND* variable. *IND* is a dummy variable which equals 1 if the firm-year observation has at least two product segments (product diversified firm), and null value otherwise (single-activity firm). To evaluate the effect of the financial crisis, the diversification variable is interacted with a *CRISIS* dummy. The coefficient of this interaction allows us to test whether the implications of this strategy differ between pre-crisis and crisis years, in the spirit of Kuppuswamy and Villalonga

(2010) paper. *CRISIS* equals 1 if the observation corresponds to the year 2008 or subsequent years, and zero otherwise.

Alternatively, as robustness checks, we employ two additional proxies for degree of diversification: the number of businesses (Berger & Ofek, 1995), and the Herfindahl index (Hirschman, 1964). The former is the simple count of the number of segments at the 4-digit SIC code level (*numsegments*). The Herfindahl index (*HERF*) is computed as: $\text{HERF\_4d} = 1 - \sum_{s=1}^{n} P_s^2$

where 'n' is the number of a firm's segments (at the 4-digit SIC code level) and 'P_s' the proportion of the firm's sales from business 's'. *HERF* equals zero in focused firms, and the closer this index is to one, the higher the degree of diversification.

In addition, following prior research (such as Campa & Kedia, 2002; Denis et al., 2002; among others), we control for additional possible determinants of firm value. Hence, we control for leverage, estimated by the ratio of long-term debt to total assets (*LDTA*); profitability, computed by the EBIT to sales ratio (*EBITsales*); level of investment, defined as capital expenditures to total sales ratio (*CAPEXsales*); and firm size, approximated by the natural logarithm of the book value of total assets (*LTA*). In addition, we control for the industry (Santaló & Becerra, 2008) and year effect by including dummy variables (each group of dummies denoted by *dumINDUSTRY* and *dumYEAR*, respectively).

In addition, we control for the geographic diversification dimension to correct for the omitted variable problem (Bodnar et al., 1999). We measure geographic diversification by a dummy variable *GEO* which equals 1 if the firm-year observation has at least two geographic segments (geographically diversified), and zero otherwise (domestic firm).[8]

Finally, we perform robustness checks by accounting for ownership structure, which may alter the diversification outcomes. Concentrated ownership is seen as a substitute internal mechanism for poor investor protection (La Porta et al., 1998). We measure ownership concentration by *C1*, which is the percentage of shares held by the largest shareholder. We also control for the type of major shareholder, following Lins and Servaes (2002) classification: individual ownership, corporate ownership, institutional ownership and government ownership. We include a set of three dummies: *Individual* (which equals 1 if the major shareholder is a person, and 0 otherwise), *Corporate* (which equals 1 if the major shareholder is a company, and 0 otherwise) and *Institutional* (which equals 1 if the major shareholder is either a pension fund, mutual fund, insurance company or direct ownership by banks; and 0 otherwise).

3.3. Estimation methodology

All equations of our analyses are regressed by using panel data to address two methodological concerns: the existence of the unobservable individual heterogeneity effect and the presence of endogeneity. The former refers to certain firm-specific time-constant characteristics (such as corporate culture or managerial team) which may also play a part in determining a firm's value. We model such an individual effect by including the term η_i in all equations.

One common concern in diversification analyses is endogeneity (Campa & Kedia, 2002; Miller, 2004; Villalonga, 2004b) since overlooking it may misattribute certain valuation effects to this strategy rather than to a firm's characteristics prior to the diversification decision.[9] In this regard, Miller (2006) recognises two sources of potential endogeneity: the likely simultaneous determination of diversification and performance by other factors, and the possible feedback from performance to diversification by which

diversification may not only impact a firm's value but wherein a firm's performance may also influence the strategic path the firm follows. Thus, recent papers link part of the value effects of diversified companies to the firm's intrinsic characteristics such as its ownership structure (Amihud & Lev, 1999; Lins, 2003; Lins & Servaes, 2002), characteristics of the acquired businesses (Graham, Lemmon, & Wolf, 2002), the match between organisational capabilities and businesses (Matsusaka, 2001), or diversity in growth opportunities across segments (Rajan et al., 2000).

To correct for endogeneity, we apply the two-step system generalised method of moments (GMM) proposed by Blundell and Bond (1998). This is an instrumental variable estimator which uses the lags of explanatory variables as instruments. As indicated in prior research (i.e. Pindado, Requejo, & Torre, 2011), one benefit of the GMM method is that it allows the endogenous nature of all firm characteristics and unobserved firm-specific effects in our diversification-value models to be accounted for. Additional advantages attributed to GMM are increased efficiency compared to other instrumental variable methods (Almeida, Campello, & Galvao, 2010), or the lack of any need for external instruments, since it uses a set of "internal" instruments (past values of the variables) contained in the panel itself (Wintoki, Linck, & Netter, 2012).

This GMM estimator is based on two assumptions: absence of second-order serial correlation and lack of correlation between the instruments and the residuals. To test the absence of second degree serial correlation in the first-difference residuals, we compute Arellano and Bond (1991) m_2 statistic. Given that the GMM estimator employs lags as instruments under the assumption of white noise errors, it would lose its consistency if the errors were serially correlated (Arellano & Bond, 1991). To assess the instrument exogeneity assumption, we use the Hansen *J*-test of over-identifying restrictions (Hansen, 1982), which follows a χ^2 distribution. The null hypothesis is the joint validity of all the instruments.

4. Empirical findings

Table 4 summarises the descriptive statistics of the variables involved in our empirical analyses. As can be observed, the most widespread diversification profile among our sample of Spanish firms is geographic diversification (89% firm-year observations). Consistent with Suárez-González (1994), Spanish firms show a low product diversifying profile. Our results reveal that more than two-thirds of the firm-year observations (two businesses on average) are industrially diversified (two businesses on average), the number of segments ranging from 1 to 9 at most.

4.1. Univariate analyses

As a preliminary analysis, we perform a difference of the *Excess_equity_sales* means test between non-crisis and crisis years (*CRISIS* = 0 and *CRISIS* = 1, respectively) on the subsample of industrially diversified firms (*IND* = 1). As displayed in Table 5, the results of this test reveal a positive difference (statistically significant at the 1% level) between diversifiers' value before and during the financial crisis, implying that the valuation of corporate diversification deteriorates as a result of the crisis. The value of industrial diversifiers is on average much lower for crisis years (the mean of *Excess_equity_sales* equals 0.447) than for pre-crisis years (1.282), thus suggesting the variation in the value of diversification over time.

Table 4. Summary statistics of variables.

	N	Mean	Median	STD	Min.	Max.	1st Quartile	3rd Quartile
Value measure								
Excess_equity_sales	437	0.911	0.445	1.377	−1.482	9.878	0.103	1.189
Industrial diversification								
numsegments	437	2.359	2	1.393	1	9	1	3
HERF	437	0.253	0.197	0.251	0	0.789	0	0.446
Ownership								
C1	412	0.303	0.220	0.223	0.008	0.921	0.130	0.470
Control variables								
LDTA	437	0.191	0.162	0.144	0	0.626	0.082	0.275
EBITsales	437	0.113	0.100	0.131	−0.481	0.705	0.056	0.153
CAPEXsales	437	0.089	0.063	0.101	0	0.908	0.028	0.113
LTA	437	7.253	6.922	1.828	4.021	11.729	5.792	8.285

Notes: Industrial diversification in the sample.
IND = 0 136 firm-year observations (31%).
IND = 1 301 firm-year observations (69%).
Geographic diversification in the sample.
GEO = 0 46 firm-year observations (11%).
GEO = 1 391 firm-year observations (89%).
This table displays descriptive statistics of the variables involved in our models for the full sample (437 firm-year observations). *Excess_equity_sales* (the excess equity value to sales ratio) proxies for the value effect. *numsegments* (number of a firm's segment at 4-digit SIC code level) and *HERF* (the Herfindahl index) capture the degree of industrial diversification. Ownership concentration is proxied by *C1*, which is the percentage of shares held by the major shareholder. Control variables: *LDTA* (financial leverage), *EBITsales* (profitability), *CAPEXsales* (level of investment in current operations) and *LTA* (size). *IND* is a dummy variable which equals 1 if the firm-year observation has at least two product segments (product diversified firm), and null value otherwise (single-activity firm). *GEO* is a dummy variable which equals 1 if the firm-year observation has at least two geographic segments (geographically diversified), and zero otherwise (domestic firm). Figures are expressed in million €.

Table 5. The value of corporate diversification before and during the financial crisis.

Industrially diversified firm-years (*IND* = 1)				
Excess_equity_sales	*N*	Mean	STD	Difference of means test between groups (1 and 2)
Group1: *CRISIS* = 0	167	1.282	0.125	Mean diff = 0.835***
Group2: *CRISIS* = 1	134	0.447	0.065	*p*-Value = 0.000 *t*-Statistic = 5.536 Degrees of freedom = 299

Notes: This table contains the two-group mean comparison tests on the value of industrial diversified firms (*IND* = 1) before and during the financial crisis. *** denotes statistical significance at the 1% level.

4.2. Multivariate analyses

Table 6 contains the estimation results of our empirical model. In Column (1), we estimate the impact of industrial diversification on the firm's value, captured by the β_1 coefficient. The *IND* dummy displays no statistical significance, indicating that diversifying across product businesses has no significant effect on firms' value ($\beta_1 = 0.022$, p-value = 0.172) in line with prior literature such as Suárez-González (1994), and Menéndez and Gómez (2000).

We delve more deeply into how the financial crisis affects the value of diversification and whether its impact varies between pre-crisis and crisis years. Regression results are displayed in Column (4) of Table 6. Here, we estimate our full empirical model in which we introduce the interaction of industrial diversification with the dummy *CRISIS*. The impact of industrial diversification on firm value is captured by β_1 for pre-crisis years (*CRISIS* = 0) and by ($\beta_1 + \beta_2 = \sum$) for crisis years (*CRISIS* = 1). The coefficient $\sum$ tests the joint significance of the diversification variable plus the interaction effect on the *CRISIS* dummy. Thus, $\sum$ captures the overall impact of industrial diversification on the subsample of crisis observations.

As reported, the interaction term *IND* × *CRISIS* shows a negative sign and is statistically significant at the 5% level. This finding indicates that the value of corporate diversification decreases during the financial crisis. Whereas the impact of industrial diversification in the pre-crisis period is positive, yet not significant ($\beta_1 = 0.015$, p-value = 0.346), the value of the coefficient associated with diversification during the financial crisis (*CRISIS* = 1) becomes negative and statistically significant ($\sum = -0.477$, p-value = 0.016). This evidence is supportive of the hypothesis that in a civil law country like Spain, the financial crisis exacerbates agency costs over the benefits of internal capital markets available from diversification, and thus proves detrimental to the value outcomes from this corporate strategy.

Control variables take the sign consistent with prior studies (Berger & Ofek, 1995; Campa & Kedia, 2002; Denis et al., 2002; among others). When significant, *LDTA* is inversely related to a firm's value, whereas the remaining controls (*EBITsales, CAPEXsales* and *LTA*) have a positive effect on firm value. Variables in the models are jointly statistically significant over the 1% level, as indicated by the Wald test. Furthermore, the m_2 and Hansen tests reported in Table 6 confirm the validity of our GMM estimations. The m_2 statistic fails to reject the null hypothesis of no second-order residual serial correlation. At the same time, the Hansen *J*-statistic does not reject the null hypothesis of absence of correlation between the instruments and the residuals.

Table 6. Diversification, firms' value and financial crisis.

	Dependent variable: *Excess_equity_sales*					
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.367 (0.650)	−0.106 (0.957)	0.433 (0.752)	0.066 (0.660)	0.521 (0.743)	0.861 (0.620)
Industrial diversification						
IND	0.022 (0.016)			0.015 (0.016)		
numsegments		0.170*** (0.044)			0.107* (0.063)	
HERF			−0.270 (0.220)			−0.350 (0.341)
Diversification and crisis						
CRISIS				−0.354*** (0.121)	−0.247** (0.122)	−0.513*** (0.085)
IND × *CRISIS*				−0.492** (0.213)		
numsegments × *CRISIS*					−0.267*** (0.054)	
HERF × *CRISIS*						−1.046*** (0.323)
∑				−0.477** (0.197)	−0.160*** (0.058)	−1.397*** (0.311)
Control variables						
LDTA	−0.102 (0.422)	−0.725*** (0.209)	−1.082*** (0.272)	−0.296 (0.614)	0.293 (0.326)	−0.207 (0.538)
EBITsales	3.845*** (0.676)	1.267*** (0.405)	0.860* (0.486)	4.023*** (0.581)	2.280*** (0.452)	2.981*** (0.762)
CAPEXsales	2.460*** (0.573)	3.990*** (0.682)	3.646*** (0.537)	2.924*** (0.673)	3.797*** (0.503)	2.688*** (0.853)
LTA	0.086 (0.061)	0.087 (0.063)	0.153*** (0.054)	0.059 (0.058)	−0.020 (0.057)	0.139** (0.054)
dumINDUSTRY	Yes	Yes	Yes	Yes	Yes	Yes

(*Continued*)

Table 6. (*Continued*).

	Dependent variable: *Excess_equity_sales*					
	(1)	(2)	(3)	(4)	(5)	(6)
dumYEAR	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	437	437	437	437	437	437
Wald test	8099.06***	117,378.90***	26,005.34***	1542.60***	39,467.04***	4379.51***
m_1	−2.91***	−2.41**	−2.38**	−2.73***	−2.71***	−2.82***
m_2	−1.11	−0.81	−0.67	−1.14	−1.21	−1.26
p-Value m_2 test	0.268	0.416	0.501	0.253	0.227	0.209
Hansen test	35.70	43.50	44.01	32.95	34.00	40.47
p-Value Hansen test	0.838	0.997	0.987	0.702	0.975	0.830

Notes: This table reports the two-step GMM system estimations. *Excess_equity_sales* (the excess equity value to sales ratio) proxies for the value effect. Industrial diversification is proxied by *IND, numsegments* (number of a firm's segment at 4-digit SIC code level) and *HERF* (the Herfindahl index at 4-digit SIC code level), alternatively. *IND* is a dummy variable which equals 1 if the firm-year observation has at least two product segments (product diversified), and null value otherwise (single-activity firm). *CRISIS* is a dummy variable which equals 1 if the observation corresponds to the year 2008 or subsequent years, and zero otherwise. $\sum$ tests the joint significance of the diversification variable plus the interaction effect on the *CRISIS* dummy. Financial leverage (*LDTA*), profitability (*EBITsales*), level of investment in current operations (*CAPEXsales*), firm size (*LTA*), industry effect (*dumINDUSTRY*) and time effect (*dumYEAR*) are controlled in all estimations. The Wald test contrasts the null hypothesis of no joint significance of the explanatory variables. m_1 and m_2 are tests for no first-order and second-order serial correlation, respectively, in the first difference residuals. The Hansen *J*-statistic is the test of over-identifying restrictions. The Hansen test is distributed as χ^2. Standard error is shown in parentheses under coefficients. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

4.3. Robustness checks

First, we conduct an additional robustness test on the impact of industrial diversification during the whole sample period of our analysis by using alternative proxies for the degree of diversification: number of segments (*numsegments*) and the Herfindahl index (*HERF*). The results are presented in Columns (2) and (3) of Table 6. These empirical findings provide further support for the absence of any significant relationship between product diversification and the firm's value when measuring diversification by *HERF*, whereas a positive and significant relationship emerges when using *numsegments* (β_1 = 0.170, *p*-value = 0.000).

Next, we move on to the focus of our analysis, namely whether there is any difference in the impact of diversification on the firm's value between pre-crisis years (captured by the coefficient β_1) and crisis years (captured by $\sum = \beta_1 + \beta_2$). As can be seen in Column (5) of Table 6, *numsegments* reduces its statistical significance when considering the interacted term *numsegments* × *CRISIS*. Both in regression with *numsegments* and with *HERF* as diversification proxies, we find that $\sum < \beta_1$, indicating that the overall impact of diversification on the firm's value becomes negative (with *numsegments*) or even more negative (with *HERF*) during crisis years compared to the pre-crisis period. Table 7 re-estimates the results of our full empirical model controlling for geographic diversification (*GEO*). In this way, we correct for the potential omitted variable bias documented in prior literature (Bodnar et al., 1999), since many firms in the sample simultaneously display both types of diversification (272 (62%) firm-year observations). Most results remain similar. Results reveal a negative and statistically significant interaction between *CRISIS* and the diversification variable (measured either by *IND, numsegments* or *HERF*), which exceeds the impact of the diversification variable itself (thereby, causing $\sum < \beta_1$), indicating that the financial crisis makes the relationship between corporate diversification and firm value more negative.

Finally, we control for ownership structure and type of majority shareholder. As shown in Table 8, the pattern of results does not vary. We find that *C1* has a positive effect on a firm's value, consistent with the idea that the existence of large shareholders contributes to alleviating agency problems within the firm.

In the regressions, control variables, when significant, display the expected signs. In addition, the m_2 and Hansen tests again support the validity of our GMM estimations. In summary, our results clearly suggest a difference in the relationship between diversification and firm value before and during the financial crisis, the crisis negatively moderating the value of corporate diversification.

5. Discussion and conclusion

In this paper, we investigate how a credit-constrained environment such as that existing during the financial crisis shapes the relationship between diversification and the firm value of listed Spanish companies over the 1997–2012 time frame. In line with recent analyses for common law settings such as the US (Kuppuswamy & Villalonga, 2010), we also find that the current financial crisis alters the value outcomes of diversification in a civil law country such as Spain. However, in contrast to the former settings, we find that the value of corporate diversification in Spanish companies deteriorates during the financial crisis. In this way, this paper is a turning point in relation to prior literature since we show that such a lower positive effect of the financial crisis on the diversification discount in settings with higher inefficiencies in the capital markets (Rudolph & Schwetzler, 2013) may even prove negative in a country such as Spain.

Table 7. Robustness checks controlling for geographic diversification.

	Dependent variable: *Excess_equity_sales*					
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.377 (0.677)	1.013 (0.639)	0.749 (0.675)	1.004* (0.574)	0.441 (0.720)	0.641 (0.606)
Industrial diversification						
IND	0.002 (0.014)			0.021 (0.014)		
numsegments		0.039 (0.075)			0.236*** (0.057)	
HERF			−0.407 (0.277)			−0.160 (0.375)
Diversification and crisis						
CRISIS				−0.489*** (0.105)	0.042 (0.148)	−0.537*** (0.130)
IND × *CRISIS*				−0.428*** (0.153)		
numsegments × *CRISIS*					−0.385*** (0.052)	
HERF × *CRISIS*						−1.116*** (0.419)
∑				−0.407*** (0.142)	−0.150*** (0.056)	−1.276*** (0.358)
Geographic diversification						
GEO	0.062** (0.026)	−0.023 (0.022)	0.033 (0.021)	−0.041*** (0.142)	−0.036** (0.015)	−0.045* (0.025)
Control variables						
LDTA	−0.260 (0.427)	−1.049 (0.662)	0.061 (0.884)	1.479*** (0.484)	0.570 (0.546)	0.530 (0.580)
EBITsales	1.010* (0.545)	5.275*** (1.221)	2.729*** (0.779)	1.451*** (0.230)	1.913*** (0.672)	1.213 (0.932)
CAPEXsales	4.600*** (0.913)	2.421*** (0.836)	3.089*** (0.820)	3.029*** (0.456)	3.489*** (0.663)	2.444*** (0.623)
LTA	0.109* (0.063)	0.008 (0.073)	0.105 (0.080)	0.036 (0.048)	−0.069 (0.045)	0.053 (0.066)
dumINDUSTRY	Yes	Yes	Yes	Yes	Yes	Yes

(*Continued*)

Table 7. (*Continued*).

	Dependent variable: *Excess_equity_sales*					
	(1)	(2)	(3)	(4)	(5)	(6)
dumYEAR	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	437	437	437	437	437	437
Wald test	3607.51***	12,869.50***	8494.63***	14,750.76***	22,288.93***	77,913.34***
m_1	−2.54**	−2.45**	−2.72***	−2.61***	−2.80***	−2.36**
m_2	−0.49	−1.17	−1.05	−1.01	−0.96	−0.89
p-Value m_2 test	0.628	0.242	0.294	0.314	0.338	0.373
Hansen test	38.96	45.81	32.24	39.78	38.83	37.84
p-Value Hansen test	0.871	0.939	0.861	0.824	0.969	0.654

Notes: This table reports the two-step GMM system robustness estimations of an empirical model controlling for geographic diversification to correct for the potential omitted variable bias. *Excess_equity_sales* (the excess equity value to sales ratio) proxies for the value effect. Industrial diversification is proxied by *IND, numsegments* (number of a firm's segment at 4-digit SIC code level) and *HERF* (the Herfindahl index at 4-digit SIC code level), alternatively. *IND* is a dummy variable which equals 1 if the firm-year observation has at least two product segments (product diversified), and null value otherwise (single-activity firm). *CRISIS* is a dummy variable which equals 1 if the observation corresponds to the year 2008 or subsequent years, and zero otherwise. $\sum$ tests the joint significance of the diversification variable plus the interaction effect on the *CRISIS* dummy. Geographic diversification is proxied by *GEO. GEO* is a dummy variable which equals 1 if the firm-year observation has at least two geographic segments (geographically diversified), and null value otherwise (domestic firm). Financial leverage (*LDTA*), profitability (*EBITsales*), level of investment in current operations (*CAPEXsales*), firm size (*LTA*), industry effect (*dumINDUSTRY*) and time effect (*dumYEAR*) are controlled in all estimations. The Wald test contrasts the null hypothesis of no joint significance of the explanatory variables. m_1 and m_2 are tests for no first-order and second-order serial correlation, respectively, in the first difference residuals. The Hansen J-statistic is the test of over-identifying restrictions. The Hansen test is distributed as χ^2. Standard error is shown in parentheses under coefficients. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Table 8. Robustness checks controlling for ownership.

	Dependent variable: *Excess_equity_sales*					
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	4.790*** (1.128)	2.807* (1.506)	4.405*** (1.222)	2.969** (1.423)	2.344* (1.334)	2.704** (1.175)
Industrial diversification						
IND	0.002 (0.026)			0.040 (0.028)		
numsegments		0.188*** (0.065)			0.160** (0.082)	
HERF			−0.166 (0.360)			0.418 (0.380)
Diversification and crisis						
CRISIS				−0.567** (0.222)	−0.457** (0.227)	−0.439*** (0.154)
IND × *CRISIS*				−0.638* (0.342)		
numsegments × *CRISIS*					−0.187** (0.089)	
HERF × *CRISIS*						−1.484*** (0.447)
∑				−0.598* (0.318)	−0.027 (0.079)	−1.065*** (0.414)
Ownership						
C1	1.049* (0.539)	1.476** (0.753)	0.943* (0.517)	1.640** (0.821)	1.304** (0.650)	1.501** (0.731)
Individual	−3.075*** (1.135)	−1.687* (1.004)	−2.932*** (0.900)	−1.658 (1.143)	−1.439 (1.049)	−1.418* (0.730)
Corporate	−2.665** (1.138)	−0.962 (1.040)	−2.402*** (0.890)	−1.006 (1.207)	−1.011 (1.065)	−0.776 (0.793)
Institutional	−3.075*** (1.170)	−1.073 (1.093)	−2.873*** (0.896)	−1.768 (1.285)	−1.516 (1.155)	−1.091 (0.812)
Control variables						
LDTA	−0.063 (0.773)	−0.967 (0.618)	−0.227 (0.592)	−0.547 (0.614)	−0.195 (0.625)	−0.738 (0.601)
EBITsales	3.174*** (0.975)	0.549 (0.664)	2.176*** (0.678)	−0.829 (0.815)	0.016 (0.700)	1.466 (0.939)
CAPEXsales	2.430** (0.976)	4.618*** (0.880)	2.962*** (0.876)	5.006*** (1.245)	4.968*** (1.052)	3.445*** (1.157)
LTA	−0.109 (0.088)	−0.099 (0.088)	−0.070 (0.084)	−0.149 (0.095)	−0.077 (0.074)	−0.091 (0.094)
dumINDUSTRY	Yes	Yes	Yes	Yes	Yes	Yes
dumYEAR	Yes	Yes	Yes	Yes	Yes	Yes

(*Continued*)

Table 8. (*Continued*).

	Dependent variable: *Excess_equity_sales*					
	(1)	(2)	(3)	(4)	(5)	(6)
No. Obs.	412	412	412	412	412	412
Wald test	11,504.02***	34,793.93***	12,598.85***	4225.35***	8360.75***	4789.64***
m_1	−1.13	−1.46	−1.11	−1.67*	−1.71*	−1.60
m_2	−0.57	−0.52	−0.46	−0.08	−0.32	−0.50
p-Value m_2 test	0.566	0.600	0.642	0.940	0.751	0.614
Hansen test	28.00	27.54	32.42	27.92	29.33	25.42
p-Value Hansen test	0.857	0.981	0.763	0.972	0.974	0.997

Notes: This table reports the two-step GMM system robustness estimations of an empirical model controlling for ownership. *Excess_equity_sales* (the excess equity value to sales ratio) proxies for the value effect. Industrial diversification is proxied by *IND, numsegments* (number of a firm's segment at 4-digit SIC code level) and *HERF* (the Herfindahl index at 4-digit SIC code level), alternatively. *IND* is a dummy variable which equals 1 if the firm-year observation has at least two product segments (product diversified), and null value otherwise (single-activity firm). *CRISIS* is a dummy variable which equals 1 if the observation corresponds to the year 2008 or subsequent years, and zero otherwise. $\sum$ tests the joint significance of the diversification variable plus the interaction effect on the *CRISIS* dummy. Ownership concentration is proxied by *C1*, which is the percentage of shares held by the major shareholder. Type of majority shareholder is captured by a set of three dummies: *Individual* (which equals 1 if the major shareholder is a person, and 0 otherwise), *Corporate* (which equals 1 if the major shareholder is a company, and 0 otherwise) and *Institutional* (which equals 1 if the major shareholder is either a pension fund, mutual fund, insurance company or direct ownership by banks, and is 0 otherwise). Financial leverage (*LDTA*), profitability (*EBITsales*), level of investment in current operations (*CAPEXsales*), firm size (*LTA*), industry effect (*dumINDUSTRY*) and time effect (*dumYEAR*) are controlled in all estimations. The Wald test contrasts the null hypothesis of no joint significance of the explanatory variables. m_1 and m_2 are tests for no first-order and second-order serial correlation, respectively, in the first difference residuals. The Hansen *J*-statistic is the test of over-identifying restrictions. The Hansen test is distributed as χ^2. Standard error is shown in parentheses under coefficients. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

These findings suggest that diversified Spanish firms have failed to capitalise on the financial flexibility to emerge from their internal capital markets. Instead, external capital constraints imposed by the financial crisis have led diversification costs to increase more than benefits. These costs are mainly associated with the potential inefficiency of internal capital markets, which is higher in contexts with lower investor protection (Rudolph & Schwetzler, 2013). Civil law contexts such as Spain offer weaker legal protection for investors (La Porta et al., 1998, 2000) which is likely to drive self-interested managerial behaviour and, thereby, agency problems within firms' internal capital markets, causing them to be inefficient.

During the financial crisis, the credit crunch has spread across external capital markets. As a result, firms are more likely to reduce external debt, and diversified firms to resort to their internal capital markets to raise funds. This lower use of external debt, regarded as an internal governance mechanism against managerial discretion (Jensen, 1986), is likely to increase agency costs from cross-subsidisation and overinvestment, weakening the potential benefits of corporate diversification. Our empirical findings confirm that the relationship between industrial diversification and a firm's value for Spanish companies has changed during the crisis period, the value of industrial diversifiers being penalised in the context of external capital constraints in a civil law country such as Spain.

This paper contributes to the existing diversification literature in two different ways. First, this study provides a better understanding of the diversification-value relationship by exploring the relevance of the institutional environment. Concurring with prior literature (Chakrabarti et al., 2007; Kuppuswamy et al., 2012; Lins & Servaes, 1999), our evidence supports the fact that the scale of the benefits/costs of the corporate diversification strategy depends on the institutional framework in which companies operate. As a result, the value of corporate diversification differs across institutional settings. Second, this paper contributes to the scarce evidence of the value of corporate diversification in Spanish companies. To the best of our knowledge, this is the first paper to investigate the effect of the current financial crisis on the value of diversification for the case of Spain. Our analysis highlights the relevant role played by internal capital markets and the protection of investors' rights in explaining empirical results for Spanish firms.

The present paper points the way towards interesting paths for future research, although it is not without its limitations. First, as with other prior papers addressing the case of Spain (Menéndez & Gómez, 2000; Ramírez-Alesón & Espitia-Escuer, 2002), our Spanish sample size does not allow us to use the widespread "excess value" measure proposed by Berger and Ofek (1995), thus partly limiting the comparability of results with most US evidence. Second, we perform our analyses in a single country. Further research should check the consistency of our results in other civil law countries. Considering other related characteristics of a firm such as its ownership structure and interaction effects with our variables may also prove interesting to shed further light on the diversification-value relationship. In addition, when the financial crisis is finally over, it might prove interesting to examine the value of corporate diversification using post-crisis data in order to analyse whether agency costs attenuate during the financial crisis in these types of institutional settings and whether, as a result, diversification strategy becomes more valuable.

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Notes

1. See Martin and Sayrak (2003), and Erdorf et al. (2013) for surveys concerning the research on diversification-value relationship.
2. Previous studies into the diversification–performance relationship in Spanish companies include those by Suárez-González (1994), Menéndez and Gómez (2000), Ramírez-Alesón and Espitia-Escuer (2002), or Jiménez-Palmero and Benito-Osorio (2011). Most yield empirical evidence of an absence of any significant relationship.
3. Related to this idea, Cline, Garner, and Yore (2014) show that conglomerates with inefficient internal capital markets are less likely to issue debt and equity. Internal capital markets thus serve as a means to avoid external monitoring for managers and alleviate external financial pressure, whilst also reducing the disciplinary potential of external financing for managers under agency problems.
4. Both Worldscope and Datastream were accessed from Thomson Financial.
5. Berger and Ofek's (1995) sample selection criteria are widespread in diversification research. They exclude companies with any financial segment due to the special features of these companies for valuation. Diversification in financial companies has been studied separately (see e.g. Laeven and Levine (2007) or Elsas et al. (2010)).
6. Most papers studying the effect of diversification on value follow Berger and Ofek (1995) sample selection criteria, whose original restriction requirement is $20 million minimum sales, which converted into Euros is €14.76 million. We apply the exchange rate on 21 January 2014.
7. This is in line with prior empirical studies on the value effect of diversification for Spanish firms (Menéndez & Gómez, 2000; Ramírez-Alesón & Espitia-Escuer, 2002). Our sample size does not allow us to compute Berger and Ofek (1995) "excess value" measure, broadly used in prior diversification research on US data.
8. We cannot measure the degree of geographic diversification by computing the number of geographic segments since information available in this type of database has limited meaning. As there is no specific requirement regarding group segment areas, geographic segments disclosed by companies are aggregated in databases in accordance with the arbitrary limit of segments imposed by each database structure (Bodnar et al., 1999; Denis et al., 2002).
9. Both the decision to diversify and its value outcomes are endogenously determined. As Miller (2004, p. 1103) states: "... the ex post diversification discount measured in cross-sectional studies may be an artifact of *ex ante* differences in firm resources apart from diversification strategy".

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