The Hedging Value Conditional to Corporate Governance: Evidence from European Nonfinancial Firms

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Abstract

We use a sample of 576 European firms to investigate if the use of hedging instruments is consistent with a higher valuation for firms that experience strong governance structures. After controlling for other variables and accounting for possible endogeneity of hedging decision, we find that hedging and firm-level governance are significant determinants of firm value. However, unexpectedly we find that hedging is a value decreasing strategy, which suggests that European firms are using hedging instruments inefficiently or even to speculate. Moreover, we do not find any evidence that stronger corporate governance structures facilitate the implementation of valuable hedging strategies.
1. Introduction
Risk management activities have become standard practice for firms facing financial risks, which seem to be in line with the positive theories that evoke risk management at the firm level as valuable to shareholders in the presence of capital market imperfections. However, there are in depth discussions in academic literature concerning the truthful contribution of risk management to firm value.

Over time, researchers have used two main approaches to empirically examine whether hedging increases firm value. The first has tried to uncover which hedging theory best describes firms’ use of derivatives (e.g., Bartram, Brown, & Fehle, 2009). More recently, the central question has been whether or not hedging adds value to the firm. Empirical studies under this second approach directly test the impact of risk management activities on firm value (e.g., Allayannis & Weston, 2001; Jin & Jorion, 2006). In fact, it is recognized that corporate hedging might be ineffective if it fails to add value or even counterproductive by destroying value. This is due to the fact that the conception and implementation of a hedging strategy can represent significant costs for the firm, despite the risk management benefits identified in the literature.

Risk management theories are classified under two main classes: shareholder value-maximizing theories and managerial utility-maximizing theories. As expected, theories developed on the basis of shareholders value maximization suppose that risk management activities pursued by the firm align the interests of managers and shareholders. However, if there is no proper control over managers’ actions, they may be tempted to pursue risk management activities looking to maximize their own objectives, thereby hurting risk management value. So, while previous risk management research made mostly with U.S. data focus on the unconditional value effect of risk management, Allayannis, Lel and Miller (2009) highlight the idea that value through risk management could be conditional to corporate governance structures.

Despite the straightness of the risk management-value argument, a prominent feature of previous empirical research is that the existence of a value premium associated with hedging is still unclear. Moreover, empirical evidence concerning the influence of a firm’s quality of governance on the way the firm uses hedging instruments is indubitably scarce. It is likely that part of the inconsistent results reported in previous value/hedging empirical studies is due to methodological aspects. One possible explanation could be related to the hedging definition frequently used (Clark & Judge, 2008). Indeed, hedging activities tend to be associated with the use of derivatives, disregarding the fact that hedging can be pursued by other means. Furthermore, the majority of prior studies focus on small industry-specific samples of firms and, mostly, samples from one country. On this matter, we observe that the use of small samples imposed restrictions on the estimation of effects across several variables simultaneously, which turns out to be a key issue. While some papers deal with this issue by applying simultaneous equations models (e.g., Bartram et al., 2009; Hagelin, Hólmen, Knopf & Pramborg, 2007) or sample selection (e.g., Hagelin et al., 2007; Jin & Jorion, 2006), most of the empirical studies do not account for the endogeneity implicit in the value/hedging relationship (Allayannis et al., 2009); that is to say, firm value determines the hedging choice, rather than hedging determining the value. We uphold that firm value must be considered simultaneous with hedging (Lel, 2009). Unquestionably, the hedging definition frequently used and endogeneity issues are the main subjects that only few recent studies have tried to address.

Our paper intends to closely analyse the issue of hedging premium conditional to corporate governance structures. In particular, we deeply analyse the link between firm-level and country-level governance mechanisms and firms’ hedging premium. We accomplish this by using seven alternative governance rules related to ownership, board structures and
shareholders rights to generate a firm-level governance index, and by distilling five structural measures of country-level corporate governance to one country-level governance factor using principal components analysis. Moreover, we carry out an extensive analysis to the general risk management from 576 nonfinancial firms in the four countries with stocks traded in Euronext - Belgium, France, The Netherlands and Portugal. Our primary assertion relies on the fact that hedging decision, corporate governance structures and several other financial policies affect the firms’ value. Nevertheless, we do not discard the fact that the hedging decision may be correlated with some unknown factors that are also correlated with the magnitude of a firm’s value. Therefore, in order to establish causality from hedging decision to firm value we proceed with a MLE treatment effect model to test the hypothesis that governance affects the implementation of valuable hedging strategies.

The results of this study suggest that several factors examined in prior researches are significant explanatory variables of firm value as measured by Tobins’Q. Specifically, when we account for the potential endogeneity of hedging decision, the results are consistent with the idea that hedging policy affects firm value. However, the decision to hedge is not a value enhancing strategy as expected. We interpret the negative relation between the decision to hedge and firm value as evidence that our sample firms are using hedging instruments inefficiently or even to speculate. This is corroborated by the negative relationship between leverage and hedging instruments usage, which also suggest an inefficient use of hedging instruments. Moreover, when we seek to analyse if governance affects the level of hedging premium, we must focus in the interaction between hedging decision and governance variables. In fact, we do not find any evidence that corporate governance structures lead to an incremental increase in the value of firms that hedge. Ultimately, in line with the expectations we find that smaller firms strongly governed, with more growth opportunities, with higher leverage, with higher level of geographical diversification, that are profitable and that are financially constrained are more likely to pursue value-maximizing decisions.

Our study differs in several ways from previous studies relating firm value and hedging matters. First, we use a full hedging variable, that is to say, while previous studies frequently employ derivatives use as a proxy of hedging activities, we use a dummy variable that accounts simultaneously for the use/non-use of internal and external hedging instruments. Second, we test hedging value conditional to the internal and external corporate governance structures of the firm. In this matter our contribution relates to the use of the explanatory principal component analysis in order to capture the commonalities in five country-governance measures and aggregate them into one representative variable – a country-level governance index. Third, our contribution is also methodological in nature. Specifically, we contribute to the existing hedging value related literature by explicitly address the endogeneity of hedging decision, which is accomplished by means of a treatment effect methodology. Finally, in our tests we make use of a broader sample of European non-financial firms across all industries. Indeed, the published studies by means of data from Continental Europe concerning hedging matters, namely with data based on the International Accounting Standards 32 and 39 that require detailed reporting on derivatives, are still scarce.

The remainder of the paper is organized into four more sections. Next section reviews the relevant literature and presents the summary of the evidence from related studies. Section 3 describes the data and presents the methodological approach. Section 4 contains the empirical results. Finally, section 5 concludes the paper.

2. Review of related research
2.1. Value creation through corporate risk management
The first piece of evidence concerning the direct impact of hedging on firm value is provided by Allayannis and Weston (2001). The authors used a large sample of US firms and
documented the existence of a hedging premium that is statistically and economically significant for firms with exposure to exchange rates. The hedging premium represents, on average, 4.87% of firm value. Kim, Mathur and Nam (2006) have compared and contrasted the value effect of financial hedging versus operational hedging. Their results reveal that financial hedging improves, on average, 5.4% of firm value and operational hedging increases firm value as a range of 4.8%-17.9%, which could represent up to five times more than financial hedging.

As well, Carter, Rogers and Simkins (2006), Clark and Mefteh (2010) and Bartram, Brown and Conrad (in press) confirm the existence of a hedging premium. Carter et al. (2006) look into the relation between hedging and firm value in the US airline industry. They find evidence that the hedging premium ranges between 5% and 10%. Bartram et al. (in press) using a broad sample of non-financial firms from 47 countries, only find a weak statistical significance for hedging premium. Finally, Clark and Mefteh (2010), using a sample of 176 of the largest French non-financial firms, provide evidence that foreign currency derivatives use is a significant determinant of firm value and that this effect is more intense in the larger and highly exposed firms.

Recently, Clark and Judge (2009) using a sample of UK firms with foreign operations draw a distinction between short- and long-term foreign currency derivatives and examine whether the use of these derivatives increases firm value. Unlike the previous studies presented above, they also consider the value effect of foreign debt hedging. Their results indicate that foreign currency derivatives use increases firm value but there is no hedging premium associated with foreign debt hedging, except when combined with foreign currency derivatives. The hedging premium found in this study is similar in magnitude and range to that found by Allayannis et al. (2009). Yet, these authors find that the hedging premium is only statistically significant for firms that have strong country-level external governance.

By contrast, Guay and Kothari (2003) estimate the cash flow implications from hedging programs for 234 large US non-financial firms and found that the economic significance of the cash flows, and as a consequence the potential increase in market value, is small. Also, Jin and Jorion (2006) examine the US oil and gas industry and find that the effect of hedging on market value is not statistically significant, suggesting that the hedging premium depends on the types of risks to which the firm is exposed.

Finally, under a different approach, Hagelin et al. (2007) investigate the impact on firm value for a specific factor – managerial stock option plans – that encourages hedging, namely “bad” hedging, in a sample of Swedish firms. They confirm that foreign exchange hedging that satisfies managerial self interest reduces firm value.

2.2. The value of corporate risk management and the quality of governance

Large numbers of studies analyse the link between corporate governance and firms’ value or performance. However, most of this literature focuses on particular aspects of governance, such as board composition, shareholder activism, executive compensation, inside share ownership, or takeover defences. In fact, there is limited work that assesses whether corporate governance mechanisms in aggregate predict firms’ market value or performance. The same works out for the studies that relate corporate governance and hedging activities.

Instead of looking to a single control mechanism, Lel (2009) addresses the impact of corporate governance on the determinants of a firm’s use of derivatives through the use of one variable that provide an aggregate measure of the firm-level quality of governance. He constructs a firm-specific governance index that proxies for firm-level quality of governance. The index comprises seven alternative governance rules related to ownership and board structures that are hand-collected from firms’ annual reports. From the view of corporate
governance literature, the degree of monitoring of managerial activities is expected to increase (which means that the agency costs of equity are expected to decrease) with higher values of this governance index. As a result, the likelihood of derivatives use for hedging purposes is expected to increase.

In addition, Lel (2009) also uses a proxy for the country-level quality of governance obtained from La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998) – the English legal origin. His evidence suggests that strongly governed firms use derivatives in a way that is consistent with shareholder value-maximization. By contrast, weakly governed firms use derivatives for reasons related to managerial utility-maximization.

To the best of our knowledge, Allayannis et al. (2009) is the only one that investigates the impact of quality of governance on the value of risk management activities. Similar to Lel (2009), the authors also construct a firm-specific governance index which proxies for internal corporate governance structures. The index comprises seven alternative governance rules and ranges from 0 (weak governance) to 7 (strong governance). In fact, this index is very similar to those of Lel (2009). In addition, Allayannis et al. (2009) use several proxies for external country-level governance mechanisms: i) an aggregate index representing the strength of shareholders’ rights that is obtained from La Porta et al. (1998) and that provides a measure of the level of shareholders’ protection under law; ii) the strength of creditors’ rights that is represented by an aggregate index, also obtained from La Porta et al. (1998) and that measures the level of creditors’ rights under bankruptcy and reorganization laws; iii) English legal origin; iv) the efficiency of the judicial system as it affects business, which is scaled from 0 to 10 and is produced by Business International Corporation; v) the extent to which private or public enforcement exists; vi) the merger activity within the country; and vii) the legality measure constructed by Berkowitz, Pistor and Richard (2003). Both the public enforcement index and private enforcement index are obtained from La Porta, Lopez-de-Silanes and Shleifer (2006). With regard to merger activity within the country, it is expected that the threat of a takeover disciplines managers and leads them to focus on value maximization. Finally, it is expected that firms that reside in countries with strong legality pursue more valuable risk management activities in comparison to firms residing in countries with weak legality.

Allayannis et al. (2009) documented that hedging is a value increasing strategy for firms around the world. They also suggest that stronger internal and external corporate governance structures lead to increases in the value of firms that hedge. Moreover, they find that firms characterized by weak internal governance but residing in countries with strong external governance structures also engage in valuable risk management activities.

3. Data and methodology

3.1. Sample selection

The initial sample includes all nonfinancial firms listed on Euronext belonging to the following indexes at December 31, 2007: Brussels all Shares Price, CAC all shares, Amsterdam Exchanges all shares and PSI General. We did not take into account multiple listings by the same firms, selecting the main market where the firms are listed. For our final sample we match firms that have the annual report for 2007 in English, French or Portuguese published on their web site with firms that have sufficient accounting data for the same year, and share prices data during the 2006-2008 period, reported on the Infinancials database. In addition, we considered only firms that have foreign sales and the necessary hedging and governance data disclosed on the annual report. Finally, we dropped 13 companies since they do not have inside ownership data reported on Bloomberg database. This approach left us with 576 firms in our sample.
Infinancials is our primary source of information, namely on what concerns the accounting and financial information used in the construction of the variables that proxy for firms’ characteristics. We also use firms’ annual reports to collect information about foreign involvement and about hedging and governance practices, and we obtained gross national product per capita from the World Economic Outlook database (International Monetary Fund).

Firms are ranked into industries according to the Industry Classification Benchmark (ICB) classification codes in the Infinancials database. This procedure results in firms’ distribution by nine industries. The largest industry – Industrials – represents 25.3% of the sample, followed by Technology, which represents 18.5% of the sample. The country composition is as follow: Belgium firms represent 13.7% of the sample, French firms 63.9%, Dutch firms 14.8% and Portuguese firms 7.6%.

3.2. Variables

3.2.1. Dependent variable
We use Tobin’s Q ($Q$) as our measure of firm value. Following Doidge, Karolyi and Stulz (2004), Allayannis and Weston (2001) and Allayannis et al. (2009), we compute Tobin’s Q as the ratio of market value to replacement cost of assets, evaluated at the end of the fiscal year for each firm. We use book value of total assets minus book value of equity plus market value of equity as a proxy for market value of assets, and book value of total assets as a proxy for replacement cost of assets. A Tobin’s Q greater than 1.0 indicates that investors have a positive outlook for the firm’s growth opportunities.

3.2. Independent variables

3.2.1. Measures of corporate risk management
Our primary independent variable is a dummy variable that is set to one if a firm uses either external or internal hedging instruments ($HEDGE$), and zero otherwise. Despite the fact that the vast majority of empirical studies define hedgers and non-hedgers based on the use or non-use of derivatives, ignoring the fact that hedging can be pursued by other means, contemporary studies recognize the importance of internal hedging techniques and put forward the inadequate specification of existing variables proxying the implementation of hedging strategies, as a source of empirical tests bias (e.g., Judge, 2006; Clark & Judge, 2008).

For example, Judge (2006) analyses all types of risks (foreign exchange risk, interest rate risk and commodity price risk) and defines hedgers as firms that use derivatives or non-derivatives hedging methods. It is worth noting once again that the usage of one or other of the previously mentioned variables is conditioned to data availability. This is quite clear, when we refer to the limited number of studies using data for non-US firms, mainly in continental Europe. Conveniently, this situation tends to improve, mainly because of mandatory disclosure requirements set by regulators.

Following Judge (2006), we search annual reports for qualitative disclosures about hedging practices and classify firms as hedgers if their annual report specifically mentions the use of internal and/or external hedging instruments. Firms that reveal the existence of natural hedge, foreign currency borrowing, domestic currency invoicing, netting agreements and asset/liability management, which is termed as matching/netting, contract interest limitation clauses, pricing agreements and contract pass-through clauses, are all considered within the scope of internal instrument users. On the other hand, a firm is classified as external hedger if it discloses the use of any of the following derivative instruments for hedging purposes: forwards, futures, forwards or options. In fact, all the firms in our sample reveal the use of derivatives for hedging purposes. Table 1 shows that across the entire sample of 576 firms,
Table 1: Summary statistics of hedging by category of risk instrument

<table>
<thead>
<tr>
<th>Category of risk Instrument</th>
<th>Firms</th>
<th>Hedgers</th>
<th>Internal</th>
<th>All</th>
<th>Matching/netting</th>
<th>Others</th>
<th>Derivatives</th>
<th>Forwards</th>
<th>Futures</th>
<th>Swaps</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange rate</td>
<td>576</td>
<td>71%</td>
<td>60%</td>
<td>52%</td>
<td>21%b</td>
<td>49%</td>
<td>44%</td>
<td>1%</td>
<td>13%</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td>Interest rate</td>
<td>576</td>
<td>51%</td>
<td>3%</td>
<td>1%</td>
<td>1%c</td>
<td>50%</td>
<td>41%</td>
<td>11%</td>
<td>45%</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>Commodity price</td>
<td>576</td>
<td>14%</td>
<td>6%</td>
<td>0%</td>
<td>6%d</td>
<td>10%</td>
<td>3%</td>
<td>5%</td>
<td>3%</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>All firms</td>
<td>576</td>
<td>80%</td>
<td>62%</td>
<td>52%</td>
<td>25%</td>
<td>65%</td>
<td>44%</td>
<td>6%</td>
<td>48%</td>
<td>33%</td>
<td></td>
</tr>
</tbody>
</table>

Note. This table shows summary statistics of hedging instruments usage by category of risk instrument. The second and third columns provide the number of firms analysed and the percentage of total firms that use hedging instruments. Further, it presents the percentage of firms using internal and external hedging instruments in general and by particular instrument. The information about hedging practices is hand-collected from firms’ annual reports.

a Statistics for matching/netting includes natural hedge, asset/liability management and netting agreements, depending the category of risk.
b In the case of exchange rate instrument statistics for others include foreign currency debt, domestic currency invoicing and contract exchange rate pass-through clauses. c In the category of interest rate instruments statistics for others is limited to contract interest limitation clauses. d In the category of commodity price instruments statistics for others includes both, pricing agreements and pass-through clauses in sales contracts.

80% of firms disclose the use of some type of hedging instruments. Furthermore, it shows that the use of internal hedging instruments and of derivatives are comparable, 62% and 65%, respectively. The internal and external hedging practices mostly used are matching/netting and swaps, 52% and 48%, respectively. Despite these remarkable general usage rates, the examination of hedging practices according to the category of risk hedged reveals pronounced differences between them. The most common is the use of exchange rate hedging instruments (71%), followed by interest rate instruments (51%). Yet, only 14% of the firms on the sample use commodity hedging instruments, which may be consistent with Bartram’s (2005) view that only few corporate cash flows are affected by commodity price changes.

3.2.2. Corporate governance quality

As already discussed, it is expected that hedge behaviour depends on the firms’ choices on governance. Thus, in line with Lel (2009), we make use of a firm-level index (CG_INT) comprised of seven widely used governance control mechanisms hand collected from firms’ annual reports. The index was built taking into account three dimensions considered important by literature to access corporate governance quality: (1) board matters, (2) shareholders’ rights, and (3) ownership structure. Each feature must refer to a governance element that is not legally required. Lel’s firm-level governance index follows Gompers, Ishii and Metrick (2003) index based-methodology, but whereas a higher G-index is associated with a weaker governance structure, a higher score of Lel’s index is expected to represent a higher level of monitoring of managerial activities, which is associated with a higher governance structure.

Lel’s firm-level governance index (CG_INT) construction is straightforward: each proxy variable is assigned with the value of one if it is applied, and zero in the otherwise situation. One point is added for each variable that assigned the value of one, which is interpreted as an active move by management to improve firms’ corporate governance structures. In what concerns board matters, a firm earns one additional point if the roles of the chief executive officer (CEO) and the chairman are separated. This is in line with Yermack (1996), who finds that firms are more highly valued when the CEO and the chairman positions are separated.

Related to shareholders’ rights dimension, the firm gets one point if there is no divergence between cash flow and voting rights of the largest managerial shareholder (La Porta, Lopez-de-Silanes, Shleifer & Vishny, 2002), and according to Doidge (2004) if there are no stocks with differential voting rights. The confirmation of these last requirements can be interpreted as nonexistence of limitations to shareholders rights. The next stage establishes the type of entity that is in control of each of our sample firms, for the reason that ownership
concentration may not suffice as an indicator of the degree of governance, while the identity of owners may play a more crucial role. A firm earns one additional point if there exists at least one non-managerial (Mitton, 2002) and non-institutional large shareholder (Shleifer & Vishny, 1997), if there exists an institutional large shareholder (Cremers & Nair, 2005), if there is no family large shareholder (Hagelin et al., 2007), and finally if there is any ownership by the state (Claessens, 1997). In general, it is implicit that strongly governed firms are more likely to pursue value-maximizing decisions. Consequently, better-governed firms are more likely to use hedging instruments in a way consistent with the value-maximizing theories of hedging.

La Porta et al. (1998) refer the degree of country’s laws protecting investor rights and the degree to which those laws are enforced as fundamental determinants of the ways in which corporate governance progresses in that country. Within this context, and in the spirit of Allayannis et al. (2009) and Bartram et al. (2009), we use five variables to capture the influence from country-level governance on firms’ hedging activities: the index of effective legal institutions and the index of rule of law, that measures both, the legal environment and the law enforcement; the aggregate index of creditor rights protection as a measure for creditors rights; the aggregate index of shareholder rights protection as a measure for shareholders rights; and country ownership concentration.

Given that the average correlation between some pair of the country-level governance proxies is expected to be high, multicollinearity problems could arise. Therefore, following Ammann, Oesch and Schmid (2010), we use exploratory principal component analysis in order to capture the commonalities in the five country-governance measures and aggregate them into one representative variable – a country-level governance index (CG_EXT). We retain the factors that have an eigenvalue greater than unity. We define our country-level governance index as the first principal component of the PCA, which retains 80.51% of the total variance within the original data (see Table 2).

### Table 2:

**Country-level governance index based on exploratory principal component analysis**

<table>
<thead>
<tr>
<th>Variables</th>
<th>PC1</th>
<th>PC2</th>
<th>PC3</th>
<th>PC4</th>
<th>PC5</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR_R</td>
<td>0.722</td>
<td>-0.557</td>
<td>0.350</td>
<td>-0.047</td>
<td>0.210</td>
</tr>
<tr>
<td>LAW</td>
<td>0.125</td>
<td>0.098</td>
<td>-0.230</td>
<td>-0.960</td>
<td>0.000</td>
</tr>
<tr>
<td>LEG</td>
<td><strong>0.654</strong></td>
<td>0.715</td>
<td>-0.129</td>
<td>0.189</td>
<td>-0.094</td>
</tr>
<tr>
<td>OWN</td>
<td>0.002</td>
<td>0.009</td>
<td>0.508</td>
<td>-0.120</td>
<td>-0.853</td>
</tr>
<tr>
<td>SH_R</td>
<td>-0.189</td>
<td>0.411</td>
<td>0.742</td>
<td>-0.160</td>
<td>0.468</td>
</tr>
</tbody>
</table>

**Note:** Panel A reports the factor loadings of the five country-level governance proxies included in PCA. We retain the factors with an eigenvalue greater than unity. We follow the approach proposed by Ammann et al. (2010) and calculate the equally weighted average of standardized versions of the country-level governance attributes with factor loadings in excess of 0.4 in absolute value. **LEG** = Index of effective legal institutions derived from a principal component analysis where the first component accounts for 84.6% of the total variance and is given by: Legality=0.381*Efficiency of judiciary + 0.578*rule of law + 0.503*absence of corruption + 0.347*risk of expropriation + 0.384*risk of contract repudiation. Source: Berkowitz et al. (2003) and La Porta et al. (1998); **LAW** = index of rule of law from Kaufmann, Kraay and Mastruzzi (2008); **CR_R** = aggregate index of creditor rights protection with values from 0 (low) to 4 (high) collected from Djankov, McLiesh and Shleifer (2007). **SH_R** = Aggregate index of shareholder rights protection with values from 0 (low) to 6 (high). Source: Djankov, La Porta, Lopez-de-silanes and Shleifer (2008); **OWN** = Ownership concentration calculated as the fraction of the country shares that are closely held; closely-held shares are defined as those held by controlling shareholders. The index is collected from Dahlquist, Pinkowitz, Stulz and Williamson (2003).

In order to interpret the factor we analyze which variables have a substantive association with the factor. To be exact, we associate the factor with those variables that have a loading
that exceeds 0.4 in absolute value. Using this approach the variables index of rule of law (\(LAW\)), the aggregate index of shareholder rights protection (\(SH_R\)) and country ownership concentration (\(OWN\)) do not load in the retained governance factor. This can suggests that these three variables are not relevant to the structure of country-level governance. Our country-level governance index could be interpreted on the basis of the level of creditors’ rights protection and on the basis of legal quality. In this sense, a country with stronger creditor protection laws and stronger legal quality has implicit a stronger governance environment. On the one hand, strong investor protection laws may contain corporate insiders’ ability to expropriate wealth from outside investors, so it is expected that outside investors are willing to pay more for financial assets, which leads to the prediction that firms in more protective legal regimes should have higher valuation. On the other hand, firms in countries where the legal system is more efficient are more prone to have managers more liable to laws. In this line, we also expect that in countries with stronger governance environments managers will be more likely to pursue value-maximizing risk management objectives (Doidge et al., 2004).

3.3. Control variables

In accordance to prior work that investigates the relation between hedging and firm value (e.g., Allayannis & Weston, 2001; Carter et al., 2006; Jin & Jorion, 2006; Allayannis et al., 2009) we use several control variables to explain the cross-sectional differences in the firm value among our sample firms.

The theory predicts that firms with more valuable growth opportunities are likely to invest more. We therefore expect investment level to be positively associated with Tobin’s Q. In line with Jin and Jorion (2006), we use, as a proxy for investment, the ratio of capital expenditures to total assets (\(CAPEX\)). To control for financing constraints we use a dummy that is set to one if a firm’s dividend yield is greater than the median dividend yield for the sample (\(DIV\)), and zero otherwise. Allayannis et al. (2009) argue that the greater the dividend yield, the lower the probability of the firm is financially constrained, and firms that are more financially constrained are more likely to have higher firm value because they only undertake positive NPV projects. Therefore, it is expected a negative relationship between the dividend dummy and firm value.

We also include leverage (\(LEV\)) to control for firm capital structure and expect a positive relationship between this variable and Tobin’s Q (Jin & Jorion, 2006). In fact, if the firm increases their leverage, this will leads to an increase in interest deductions, which in turn generates incremental tax shield benefits that can increase value. Leverage is computed by the ratio of long term debt plus short term debt to total assets (Carter et al., 2006).

Previous empirical research suggests that industrial diversification is value destroying; that is to say, firms with multiple industrial segments have lower value when compared to single segment firms. As in Allayannis and Weston (2001) we control for industrial diversification (\(INDDIV\)) with a dummy variable which equals one if the firm has at least two business segments with a different ICB 4-digit subsector classification code and zero otherwise. Inversely, it is suggested that geographical diversification is value-enhancing. We use as a measure of geographical diversification the percentage of sales from non-domestic operations (\(FS\)).

In addition, we control for firm size by using the natural logarithm of total assets (\(SIZE\)). In fact, Allayannis and Weston (2001) found differences in Tobin’s Q for large firms as compared to small firms. Namely, large firms were associated with lower Tobin’s Q. Also a profitable firm is likely to trade at a premium relative to a less profitable one. Therefore we expect profitability to be positively associated with Tobin’s Q (Allayannis & Weston, 2001).
As a proxy for profitability, we use the operating income before interest and taxes scaled by total assets, that is to say, return on assets for the current year (ROA).

At last, to control for differences in the firm value behaviour between industries and countries, we include eight industry dummy variables (IND) and three country dummy variables (COUNT).

3.4. Methodology

In our estimations we rely on the fact that hedging decision, corporate governance structures and several other financial policies affect the firms’ value. However, because firms with better growth opportunities are more likely to hedge and better growth opportunities means higher valuation, it is highly likely that firms with higher $Q$ self-select themselves into the hedging group. Thus the error in the valuation regression will be correlated with hedging dummy and will cause bias. To explicitly address the endogeneity problem described above, we apply a treatment effect model using the maximum likelihood estimator (MLE).

The treatment effect model is expressed through two equations defined in two stages. In the first stage model we assume a Probit regression where the hedging decision is driven by a set of factors that are called the selection variables:

$$
HEDGE_i = \delta_0 + \delta_1 \cdot CAPEX_i + \delta_2 \cdot PE_i + \delta_3 \cdot CG\_INT_i + \delta_4 \cdot CG\_EXT_i + \delta_5 \cdot DPS_i + \delta_6 \cdot EXP_i + \delta_7 \cdot GDP_i + \delta_8 \cdot LEV_i + \delta_9 \cdot SIZE_i + \delta_{10} \cdot TAX_i + \sum_{j=1}^{10} \delta_{10+j} \cdot IND_i + \xi_i
$$

The selection variables are the key firm-level characteristics that, in line with the optimal hedging theory, influence hedging decisions. In this sense, it is predicted that hedging can enhance firms’ value if it can decrease the agency costs of debt. It was suggested that these agency costs of debt are more evident in firms with more growth options, as these firms could have a high probability of underinvestment or asset substitution. Hence, if risk management is used to protect the continued funding of futures investment programs, we expect a positive relationship between hedging activities and the level of investment (e.g., Lin & Smith, 2008; Bartram et al., 2009). To properly capture the firms’ investment opportunity set, we use capital expenditures (CAPEX) to measure the level of investment and the price to earnings ratio (PE) to measure the firms’ growth options (Lin & Smith, 2008).

As defined earlier, we expect that firms located in countries with a stronger governance environment and that are simultaneously better-governed are more likely to use hedging instruments. We measure the firm quality of governance with a firm-level governance index (CG\_INT) and country governance environment with a country-level governance index (CG\_EXT).

Nance, Smith and Smithson (1993) predict that firms with lower dividend payouts have probably more internal funds available. It is worth nothing that the presence of liquid assets could reduce the need for hedging. Therefore, controlling liquidity through dividend yield (DPS), that is to say gross dividend per share by closing stock price, the authors suggest that firms with lower dividend payouts are less likely to hedge. Additionally, it is expected that firms with greater variation in cash flows have typically a greater potential benefits from hedging, that is why we provide the test for this last argument by using the general exposure (EXP), a dummy which is assigned a value of one if a firm experiences any of the following exposures: foreign exchange, interest rate and commodity price exposure, and zero the otherwise situation (Bartram et al., 2009).

Corporate hedging literature frequently assumes that firms with higher leverage ratios (LEV) face higher probabilities of encountering financial distress and interpret a positive
leverage coefficient as evidence that greater expected financial distress costs increase the likelihood of hedging activities (e.g., Lel, 2009). We also need to control for firm size because larger firms having the access to risk management expertise, or having economies of scale in hedging costs, are more likely to hedge than smaller firms (Nance et al., 1993). However, there are circumstances where smaller firms have more incentive to hedge than larger firms; for instance, smaller firms will hedge more, because they face greater bankruptcy costs. Thus, the effect of firm size on hedging activities is ambiguous and shall be empirically determined. Similarly, because larger economies are likely to have larger and more liquid financial markets, we include the natural logarithm of gross national product per capita (GDP) to control for the availability of derivatives and their costs (Lel, 2009); however, such countries also generally have more stable economic policies and a lesser degree of market imperfections, which suggests that firms in such countries have less need for hedging (Lel, 2009). Thus, the effect of GDP on hedging is ambiguous.

Finally, we use the ratio of net operating losses to total assets (TAX) as a proxy for the convexity of firm’s tax schedules (e.g., Géczy, Minton, & Schrand, 1997). Usually, the hypothesis tested is as follows: the greater the firm’s probability of incurrence in tax loss which will be carried forwards, the greater the probability of the firm’s engagement in hedging should be. Therefore, we expect a positive coefficient for the tax variable. We also control for differences in hedging decision between industries through the inclusion of eight industry dummy variables (IND).

Summing up, consistent with previous studies on optimal hedging theories $\delta_1$, $\delta_2$, $\delta_3$, $\delta_4$, $\delta_5$, $\delta_6$, $\delta_8$ and $\delta_{10}$ in equation (1) are expected to be positive, and $\delta_7$ and $\delta_9$ could be either positive or negative.

Next, in the second stage the hedging premium conditional to corporate governance structures is modelled (outcome model). We hypothesize that better governance leads to a more positive effect of hedging on firm value. We test this by interacting each of the governance variables, firm-level governance index (CG_INT) and country-level governance index (CG_EXT), with the hedging dummy (HEDGE x CG_INT and HEDGE x CG_EXT) to determine if there exists any incremental impact on value. Thus, we predict that the coefficients of interest in the following equation, $\alpha_2$ and $\alpha_3$ in the equation (2), will be positives. In order to have a robust estimation, we also include hedging dummy and governance by themselves in the regression in addition to the interaction effect of interest.

The equation (2) describes the main equation from our analysis. As already defined in sections 3.2 and 3.3 other than the hedging and governance variables and the interaction effects, it is a standard value regression:

$$Q_i = \alpha_0 + \alpha_1 \cdot \text{HEDGE}_i + \alpha_2 \cdot \text{HEDGE}_i \times \text{CG}_\text{INT}_i + \alpha_3 \cdot \text{HEDGE}_i \times \text{CG}_\text{EXT}_i + \alpha_4 \cdot \text{CG}_\text{INT}_i + \alpha_5 \cdot \text{CG}_\text{EXT}_i + \alpha_6 \cdot \text{CAPEX}_i + \alpha_7 \cdot \text{DIV}_i + \alpha_8 \cdot \text{FS}_i + \alpha_9 \cdot \text{INDDIV}_i + \alpha_{10} \cdot \text{LEV}_i + \alpha_{11} \cdot \text{ROA}_i + \alpha_{12} \cdot \text{SIZE}_i + \sum_{j=1}^{8} \delta_{12,j} \cdot \text{IND}_i + \sum_{j=1}^{10} \delta_{20,j} \cdot \text{COUNT}_j + \eta_i$$

The equation (2) describes the main equation from our analysis. As already defined in sections 3.2 and 3.3 other than the hedging and governance variables and the interaction effects, it is a standard value regression:

$$Q_i = \alpha_0 + \alpha_1 \cdot \text{HEDGE}_i + \alpha_2 \cdot \text{HEDGE}_i \times \text{CG}_\text{INT}_i + \alpha_3 \cdot \text{HEDGE}_i \times \text{CG}_\text{EXT}_i + \alpha_4 \cdot \text{CG}_\text{INT}_i + \alpha_5 \cdot \text{CG}_\text{EXT}_i + \alpha_6 \cdot \text{CAPEX}_i + \alpha_7 \cdot \text{DIV}_i + \alpha_8 \cdot \text{FS}_i + \alpha_9 \cdot \text{INDDIV}_i + \alpha_{10} \cdot \text{LEV}_i + \alpha_{11} \cdot \text{ROA}_i + \alpha_{12} \cdot \text{SIZE}_i + \sum_{j=1}^{8} \delta_{12,j} \cdot \text{IND}_i + \sum_{j=1}^{10} \delta_{20,j} \cdot \text{COUNT}_j + \eta_i$$

Summing up, $\alpha_1$, $\alpha_2$, $\alpha_3$, $\alpha_4$, $\alpha_5$, $\alpha_6$, $\alpha_8$, $\alpha_{10}$ and $\alpha_{11}$ in equation (2) are expected to be positive and $\alpha_7$, $\alpha_9$ and $\alpha_{12}$ are expected to be negative. We achieve reliable estimates via maximum likelihood estimation and use the likelihood ratio (LR) test for the correlation between the error terms of the two equations to check for endogeneity.

4. Results and discussion
Table 3 provides the descriptive statistics of the variables of interest. Several aspects of the descriptive statistics are worth noting. We see that the average Tobin’s Q for the firms in our sample was 1.651. The means (medians) of $CG\_INT$ and $CG\_EXT$ are 3.422 (4) and -0.0002 (-0.663), respectively, which points towards a reasonably symmetric distribution. A comparison of the statistics obtained for our $CG\_INT$ with the ones obtained by Lel (2009) confirms that average values are similar. In addition, we conclude that there are substantial differences in our firm-level corporate governance index (std.dev.=1.608), which suggest that our governance proxies are chosen and constructed in a way that leads to sufficient variance in the cross-section. The empirical distribution of our country-level governance index reveals a low variation between countries (std.dev.=1.253). This result is expected and can be explained by the fact that all the four countries on our sample are included in the Continental European Governance Model.

Table 3:

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Mean</th>
<th>Median</th>
<th>Std Dev</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Expenditures (CAPEX)</td>
<td>0.056</td>
<td>0.040</td>
<td>0.063</td>
<td>-0.063</td>
<td>0.741</td>
</tr>
<tr>
<td>Firm-level governance index ($CG_INT$)</td>
<td>3.422</td>
<td>4.000</td>
<td>1.608</td>
<td>0.000</td>
<td>7.000</td>
</tr>
<tr>
<td>Country-level governance index ($CG_EXT$)</td>
<td>-0.0002</td>
<td>-0.663</td>
<td>1.253</td>
<td>-1.495</td>
<td>2.463</td>
</tr>
<tr>
<td>Dividend ($DIV$)</td>
<td>0.498</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Dividend yield ($DPS$)</td>
<td>0.022</td>
<td>0.016</td>
<td>0.039</td>
<td>0.000</td>
<td>0.513</td>
</tr>
<tr>
<td>General exposure ($EXP$)</td>
<td>-0.858</td>
<td>1.000</td>
<td>0.000</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Geographic diversification ($FS$)</td>
<td>0.258</td>
<td>0.199</td>
<td>0.255</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>GDP</td>
<td>10.296</td>
<td>10.331</td>
<td>0.192</td>
<td>9.641</td>
<td>10.438</td>
</tr>
<tr>
<td>Hedging ($HEDGE$)</td>
<td>0.797</td>
<td>1.000</td>
<td>0.000</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Industry diversification ($INDDIV$)</td>
<td>0.444</td>
<td>1.000</td>
<td>0.000</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Financial leverage ($LEV$)</td>
<td>0.242</td>
<td>0.213</td>
<td>0.281</td>
<td>0.000</td>
<td>5.213</td>
</tr>
<tr>
<td>Price earnings ratio ($PE$)</td>
<td>35.069</td>
<td>13.886</td>
<td>173.27</td>
<td>0.000</td>
<td>3048.9</td>
</tr>
<tr>
<td>Tobin’s Q ($Q$)</td>
<td>1.651</td>
<td>1.355</td>
<td>1.097</td>
<td>0.702</td>
<td>14.577</td>
</tr>
<tr>
<td>Return on assets ($ROA$)</td>
<td>0.061</td>
<td>0.068</td>
<td>0.112</td>
<td>-0.592</td>
<td>0.787</td>
</tr>
<tr>
<td>Firm total assets ($SIZE$)</td>
<td>17.381</td>
<td>17.967</td>
<td>3.809</td>
<td>8.790</td>
<td>25.950</td>
</tr>
<tr>
<td>Tax loss carry forwards ($TAX$)</td>
<td>0.258</td>
<td>0.199</td>
<td>0.255</td>
<td>0.000</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Note. The table provides the summary statistics of all the firm-specific and country-specific variables analysed. The statistics reported are obtained by using summary statistics procedure in Gretl (version 1.9.1).

The means (medians) of PE and CAPEX are 35.069 (13.886) and 5.6% (4%), respectively. In both measures the median is somewhat smaller than the mean, indicating that there are some firms in our sample with high value of PE and CAPEX, and thus significantly influence the mean. In average, about 24.2% of firms’ total assets are financed by debt. This leverage ratio ($LEV$) is very similar to the ones of Lel (2009) and Géczy et al. (1997) – 27.4% and 28%, respectively. We can also observe that, on average, 85.8% of the sample firms are exposed to some kind of financial risk ($EXP$), which is, a priori, consistent with the higher level of hedging instruments usage reported earlier (80%). We also observe that the average value of the size variable ($SIZE$) is 3.277 thousand million, with a standard deviation of 13.606 thousand million. Thus, the firms are mostly large-sized.

In the Model 1 of Table 4, we estimate a base model of firm valuation for comparison purposes. Our model is highly significant ($F$-test=5.47) and explains approximately a third of the variation of Tobin’s Q, which is similar with the reported R-squared from Alayannis et al. (2009) and Jin and Jorion (2006). Contrary to our expectations, we find no evidence that
hedgers experience higher value of Tobin’s Q than non-hedgers. Moreover, we find that governance structures (CG_INT and CG_EXT) are neither a significant value determinant themselves, nor a significant value determinant through their effect in hedging policy. In examining the control variables, we noted that a number of coefficient estimates significantly impact firm value. Specifically, the OLS results indicate that capital expenditures (CAPEX), leverage (LEV), return on assets (ROA) and the percentage of foreign sales (FS) have a positive effect on firm value. Conversely, the dividend dummy (DIV) and firm size (SIZE) exhibit a negative and significant effect on Tobin’s Q. In fact, these results are largely consistent with expectations: firms with more valuable growth opportunities are likely to invest more; firms with higher leverage are more prone to have higher value due to the inherent increase in tax shields; firms that are more profitable tend to have higher valuation; firms that have higher level of geographical diversification are more likely to have higher value; firms with lower dividend yield are more likely to be financially constrained, so will have higher value; and, finally, smaller firms were associated with higher valuation.

Table 4: Hedging effect on Tobin’s Q conditional to governance structures

<table>
<thead>
<tr>
<th>Variables</th>
<th>M1: OLS Depent.Var.: Q</th>
<th>M2: MLE Treatment Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First stage Dep.Var.: HEDGE</td>
<td>Second stage Dep.Var.: Q</td>
</tr>
<tr>
<td>INTERCEPT</td>
<td>2.039*** (0.38)</td>
<td>18.860*** (8.35)</td>
</tr>
<tr>
<td>HEDGE</td>
<td>0.310 (0.28)</td>
<td>-0.778*** (0.38)</td>
</tr>
<tr>
<td>HEDGE × CG_INT</td>
<td>-0.128 (0.08)</td>
<td>-0.131 (0.08)</td>
</tr>
<tr>
<td>HEDGE × CG_EXT</td>
<td>0.080 (0.12)</td>
<td>0.098 (0.12)</td>
</tr>
<tr>
<td>CG_INT</td>
<td>0.126 (0.08)</td>
<td>0.032 (0.04)</td>
</tr>
<tr>
<td>CG_EXT</td>
<td>0.030 (0.13)</td>
<td>0.660*** (0.22)</td>
</tr>
<tr>
<td>DIV</td>
<td>-0.233*** (0.08)</td>
<td>-0.221*** (0.07)</td>
</tr>
<tr>
<td>CAPEX</td>
<td>1.404* (0.04)</td>
<td>0.952 (1.05)</td>
</tr>
<tr>
<td>PE</td>
<td>0.001 (0.00)</td>
<td></td>
</tr>
<tr>
<td>DPS</td>
<td>1.045 (0.94)</td>
<td></td>
</tr>
<tr>
<td>EXP</td>
<td>1.338*** (0.29)</td>
<td></td>
</tr>
<tr>
<td>FS</td>
<td>0.623** (0.29)</td>
<td>0.720*** (0.23)</td>
</tr>
<tr>
<td>GDP</td>
<td>-2.196*** (0.93)</td>
<td></td>
</tr>
<tr>
<td>INDDIV</td>
<td>0.034 (0.09)</td>
<td>0.032 (0.08)</td>
</tr>
<tr>
<td>LEV</td>
<td>1.100*** (0.47)</td>
<td>-0.488*** (0.19)</td>
</tr>
<tr>
<td>ROA</td>
<td>4.415*** (1.26)</td>
<td>1.120*** (0.39)</td>
</tr>
<tr>
<td>SIZE</td>
<td>-0.121*** (0.04)</td>
<td>0.208*** (0.08)</td>
</tr>
<tr>
<td>TAX</td>
<td>-4.701*** (1.70)</td>
<td>-0.056*** (0.03)</td>
</tr>
<tr>
<td>Country Dummies</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Industry Dummies</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>576</td>
<td>576</td>
</tr>
<tr>
<td>R² / Wald χ²</td>
<td>0.34</td>
<td>123.79***</td>
</tr>
<tr>
<td>F-test</td>
<td>5.47***</td>
<td>41.14***</td>
</tr>
</tbody>
</table>

Note. The estimates reported here are obtained through Stata (version 10.1). The table shows the estimates of OLS (Model 1) and MLE treatment effect regression (Model 2) for 576 non-financial European firms. All the variables are defined in section 3. All accounting variables, with the exception of foreign firm sales, originate from the Infinancials database. Data on firm foreign sales and on hedging and internal governance practices was manually collected from firms’ annual reports. Data on GDP originate from World Economic Outlook database (International Monetary Fund). Heteroscedasticity-consistent standard errors are reported in parentheses next to coefficient estimates. The significance levels are indicated by *, ** and *** that represent 10%, 5% and 1% level, respectively.

To control for potentially endogeneity we estimate a treatment effect model described in detail in section 3.4. Accordingly, in Model 2 of Table 4, we estimate simultaneously two relationships: (1) a set of factors that drive hedging decision, and (2) the effect of that decision on Tobin’s Q conditioned to the quality of governance structures. The LR test for rho is highly significant, which is consistent with the presence of selection bias. Hence, after
accounting for potential endogeneity of hedging decision, the results of second stage structural regression are consistent with the idea that hedging policy affects firm value. However, this effect runs counter our prediction. In Model 2, the decision to hedge is associated with a 0.78% decrease in firm value. We interpret this as evidence that, on average, the European firms are using hedging instruments inefficiently or even to speculate. It is possible that the firm is using risk management instruments, namely derivatives, as speculative tools to enlarge the overall riskiness of the firm, which enhance the value of equity at the expense of debt. After controlling for self-selection, our results also suggest that strongly governed firms (CG_INT) are more likely to pursue value-maximizing decisions. As for the control variables, we verify that the significance and the sign of the coefficients estimates are similar with those reported in Model 1. Contrary to our expectations, when we focus in the interaction between hedging decision and governance variables we do not find evidence that corporate governance structures lead to an incremental increase in the value of firms that hedge.

Analysing the results from the first stage structural regression (Model 2 in Table 4) we verify that several variables have a significant impact on firm decision to hedge. The Probit results indicate that country governance environment (CG_EXT), firm general exposure to risk (EXP) and firm size (SIZE) have a positive and gross national product per capita (GDP) a negative influence in the decision to use hedging instruments. These results are largely consistent with the expectations: firms located in countries with a stronger governance environment are more likely to use hedging instruments; firms with greater variation in cash flows have greater benefits from hedging, so are more likely to hedge; larger firms that have access to risk management expertise, or that have economies of scale in hedging costs, are more likely to hedge (Lel, 2009); and firms established in larger economies with stable economic policies that have lesser degree of market imperfections have less need to hedge (Lel, 2009).

Contrary to expectations, namely the financial distress cost rationale for hedging, leverage (LEV) impacts negatively on the use of hedging instruments; that is to say an increased leverage in reality reduces the use of hedging instruments. One possible justification is related to the bondholder wealth expropriation hypothesis, where shareholders with the financial resources provided by debt-holders encourage the funding of projects that are riskier than anticipated and thereby increase the riskiness of equity at the expense of debt holders. This situation can effectively reduce the use of hedging instruments, or can lead to their inefficiently use. Finally, also contrary to expectations, net operating losses (TAX) has a negative effect in the use of hedging instruments. One possible explanation is appointed by Graham and Smith (1999). The authors show that the firms that are most likely to have convex tax functions are small, have expected income near zero and alternate between profits and losses. In our sample firms that recently accumulate losses tend to be small, which suggest that this firms might find the fixed costs associated with hedging programs implementation unaffordable, and as a result, not hedge at all.

5. Conclusions
In this paper we analyze if the use of hedging instruments is valuable for firms that experience strong governance structures. Nevertheless, firms with better growth opportunities are more likely to hedge and better growth opportunities means higher evaluation. So, it is likely that firms with higher value, as measured by Tobin’s Q, self-select themselves into the group of firms that hedge. To address the endogeneity problem described we applied a MLE treatment effect model.

After accounting for potential endogeneity of hedging decision, the results are consistent with the idea that hedging policy affects firm value. However, the decision to hedge is
recognized as a value destroying strategy. We interpret this as evidence that, on average, the European firms are using hedging instruments inefficiently or even to speculate. It is possible that the firm is using risk management instruments, namely derivatives, as speculative tools in the context of bondholder wealth expropriation hypothesis. We find also that smaller firms strongly governed, with more growth opportunities, with higher leverage, with higher level of geographical diversification, that are profitable and that are financially constrained are more likely to pursue value-maximizing decisions. Contrary to our main expectation, when we focus in the interaction between hedging decision and governance variables we do not find any evidence that corporate governance structures lead to incremental increases in the value of firms that hedge.

6. References


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1 We identify all shareholders (blockholders) who hold more than 10 per cent of the firms’ outstanding shares (Lins, 2003). Further, to determine which blockholders are held by individuals involved with management, we compare the list of officers and directors of each firm with the list of the identified blockholders. If the name of an officer or director matches the name of an owner, this shareholder is classified as a largest managerial shareholder (Mitton, 2002). Officially reported shareholdings often leave out the voting rights extent, so we capture the existence of cash flow/voting rights divergence through the analysis of the deviations from one-share-one-vote principle. The deviations from one-share-one-vote principle create a wedge between financial interest and voting power. The idea underlying cash flow/voting rights divergence is that it increases the incentive for expropriation (La Porta et al., 2002).

2 Similarly to Smith and Amoako-Adu (1999), we classify a firm as a “family firm” if a person or a group related by family ties holds the largest block of shares and at least 10% of the outstanding shares.