Instituto Superior de Ciências do Trabalho e da Empresa

HEDGING FOREIGN CURRENCY AND INTEREST RATE RISKS WITH DERIVATIVES: HOW MUCH DOES IT INCREASE THE FIRM'S VALUE?

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Tese submetida como requisito parcial para obtenção do grau de

Mestre em Finanças

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Março 2009

I dedicate this work to my father, who always gave me the strength to pursuit my goals and to always give my best in everything I do.

I would like to thank my supervisor Professor José Dias Curto, from ISCTE Business School, for being always available and supportive when I needed. I also wish to thank Professor Amrit Judge, from Middlesex University Business School, for his valuable comments and suggestions. His published works were an important source of inspiration for my thesis.

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Hedging foreign currency and interest rate risks with Derivatives: How much does it increase the firm's value?

ABSTRACT

Traditional finance theory suggests that a company can't increase its value by changing the riskiness. However, recent studies show that it is possible to increase the firm's value using hedging instruments. In my research I pretend to show that hedging with derivatives increases firm's value, as already have been demonstrated in several different markets. The sample includes the 336 non-financial firms quoted in Lisbon, Madrid and Milan stock markets at the end of 2006.

This study presents empirical evidence on the valuation effects of Foreign Currency (FC) and Interest Rate (IR) hedging with derivatives, measured by Tobin's Q. Depending on the Tobin's Q definition, I found a 4.48%, 8.92% or 11.88% significant premium for derivative hedging firms. I also found that 91.1% hedging firms are derivative users. Sample was separate in Iberian Market (Lisbon and Madrid stock markets) and Italian (Milan stock market) subsamples. Statistical and regression methods evidence that to the Iberian firms hedging activity has more impact on firm's value than to Italian ones. Results evidence important statistical significant premiums for foreign currency and interest rate derivative hedgers in Iberian Market, about 6.37% to 20.75%, whereas Italian Market displayed significant value only with interest rate derivative hedging firms.

Keywords: Firm's value; Corporate hedging; Derivatives; Foreign currency hedging; Interest rate hedging.

JEL Classification: F30; G32

1. INTRODUCTION

In the perfect Modigliani and Miller (MM) World (1958), risk management is a useless corporate financial function, by not giving to firm shareholders any tool or advantage besides the already available ones like holding well-diversified portfolios. In this framework, corporate hedging policy seems to be irrelevant.

Unfortunately we are not living in a perfect world. According to several recent theories, some elements like taxes, access to external financing and the international market exposure growth, have been exploiting the frictions between the MM world assumption and the real markets behavior. The positive theory of corporate hedging, developed by Smith and Stulz (1985), was based on the demonstration that imperfect capital markets justify corporate hedging because it can add value to firms.

The continuous transformations in the financial environment and in the worldwide capital markets induce to a higher financial risks exposure, mainly interest rates; foreign currency and commodity's price, requiring therefore a more exigent risk management. Many previous studies have examined why firms might be hedging and its effect on firm's value, most of them about UK and USA markets. Since commodity prices usually seem to be limited to specific industries, empirical researches have been focused on interest rate and foreign currency risks.

In this paper, I have extended this analysis to the Portuguese, to the Spanish and to the Italian markets, using the non-financial firms quoted in 2006.

Smith and Stulz (1985), in their positive theory of corporate hedging as above referred, argument that firms hedge for the following main reasons: taxes, costs of financial distress and managerial risk aversion. Their study demonstrated how corporate hedging can add firm's value when they face convex costs such as progressive taxation and bankruptcy costs.

During the last two decades several studies were done regarding the hedging motivation, including its correlation with corporate aspects such as: growth opportunities for the firm, investment policy, capital structure and firm size.

Nevertheless, researches in direct impact of hedging on firm's value only recently have begun. The first important paper was done by Allayannis and Weston (2001). This work examined the usage of foreign currency derivatives in a sample of 720 large US non-financial firms and was first posted in 1998.

In my study I will try to find evidence of firm's increased value when they hedge Foreign Currency (FC) and/or Interest Rate (IR) risks with derivatives, focused on the 336 non-financial firms quoted in Lisbon, Madrid and Milan stock markets. As a proxy for the firm's value, I used Tobin's Q variable. This variable has been used by several authors, representing the dependent variable in a multivariate approach, as following described.

Belghitar et al. (2008) analyzed the top non-financial UK firms ranked by market value at the end of 1995 and their results provide evidence of a significant relationship with firm's value, measured by Tobin's Q. In their studies, they found a hedging premium of 14.7% resulting from FC derivative hedging. The corresponding result for IR derivative hedging was 18.6%. This study provided evidences that hedge interest rate risks with derivatives increase UK firm's value more than hedging foreign currency risks.

Allayannis and Weston (2001) studied the impact on non-financial firm's value regarding the usage of foreign currency derivatives (FCD's). As a proxy for firm's value they also used Tobin's Q, computed as market value of assets divided by replacement cost of assets (mean equal to 1.18 and median equal to 0.95, smaller than the mean which indicates that the distribution of Tobin's Q is skewed to the left). They found a positive relationship between firm's value and the FCD's usage. According to these authors, the benefit of using Tobin's Q as a proxy for firm's value is that it allows doing comparisons across firms in an easier way than comparisons based on other variables as stock returns or accounting measures where a risk adjustment or normalization is required. They found that, on average, non-financial firms that face currency risks and hedge these risks with derivatives have a 4.87% higher value than non-derivative hedgers. Allayannis and Weston also tested two additional Tobin's Q definitions: (1) the market value of the firm to the book value of total assets; (2) the market value of equity to book value of total sales. The results obtained were independent from the method firm's value was measured.

Kapitsinas (2008) analyzed the impact of derivatives usage on the firm's value, using 81 Greek non-financial firms listed in the Athens stock market with exposure to financial risks, for the years 2004-2006. These firms have their annual report published according to the International Financial Reporting Standards (I.F.R.S), which makes the derivative usage information research into an easier work. He also used Tobin's Q as a proxy for evaluating the firm's value. In his empirical study he found that, on average, non-financial firms that use derivatives in general and/or foreign currency and interest rate derivatives in particular, have a positive and significant effect on firm's value of 4.6%.

Mackay and Moeller (2007) modeled and estimated the value of corporate risk management using 34 oil refiners as a sample. They found that hedging concave revenues and leaving concave costs exposed, each represent between 2% and 3% of the firm's value, using derivatives or other securities. They also use Tobin's Q as a proxy for the firm's value, computed as a market-to-book value ratio (mean equal to 1.26 and median equal to 1.22, also smaller than the mean which indicates that Tobin's Q distribution is skewed to the left).

Sometimes, the question of hedging is not clear enough for all corporate stakeholders, institutional investors, shareholders and bondholders, and treasury managers. Nevertheless, there are some empirical evidences that institutional investors also agreed in hedging activity, but motivations can differ from the ones that managers choose (Salomon and Joseph, 2000). The key question for the shareholders is if firm's value can be increased by hedging activity. There are some empirical studies, especially in US and UK markets, suggesting that hedging adds value to firms. In the US market IR hedging is more valuated, whereas in UK market FC hedging is more important.

Some of the previous studies had limited information about the hedging positions, justified by the fact that in most countries firms were only recently obliged to reveal to the public either the risks they face or actions they take to manage these risks. United States was the major exception; firms are required to disclose information about usage of financial instruments with off-balance sheet risk since the nineteen's.

Due to this limitation, most of the studies used firm surveys to reach their conclusions. The major issue about these surveys is the response rate: mostly around 30% or 40%, depending on the country it has been done. Regarding this matter, in order to obtain a representative sample, it would be necessary to starting with a large number of firms.

Fortunately, the International Financial Reporting Standards (IFRS) have already been implemented in many worldwide countries, including the members of the Economic and Monetary Union (EMU) in Europe. As a consequence, firms in these countries have the obligation to disclose, in their annual reports, whether they use derivative contracts for hedging or for trading purposes, providing also information about all kind of risks they face and the actions they take to properly handle with them.

In my study I have already benefited from these firms obligations, since I used 2006 data information and the derivative report obligation was already implemented in the chosen countries: Portugal, Spain and Italy. Information was collected from annual reports and DataStream database. Considering the low surveys response rate and as only quoted firms have their annual reports published in the internet, I only included quoted firms (Lisbon,

Madrid and Milan stock markets). As already mentioned, I also used Tobin's Q as a proxy for firm's value.

Empirical studies were done separately for full sample (non-financial firms quoted in Lisbon, Madrid and Milan stock markets; 336 firms), Iberian market (non-financial firms quoted in Lisbon and Madrid stock markets; 159 firms) and Italian market (non-financial firms quoted in Milan stock market; 177 firms). I also found some evidences that in average hedging financial risks, foreign currency and interest rate, increase firm's value. Moreover, Iberian market shows a stronger effect on firm's value when hedging their FC (IR) financial risks. The Italian market evidence a weaker impact of hedging activity in firm's value, where only derivative interest rate users display any statistically significant value.

The remainder of the work proceeds as follows. Section 2 discusses the samples construction and the definition of variables, Tobin's Q and control variables. Section 3 presents the sample and sub-samples descriptions, the methodology and the analysis results, using Univariate and Multivariate approaches. Section 4 summarizes our concluding remarks.

2. METHODOLOGY

The objective of this work is to prove that derivative hedging firms included in my sample, the non-financial firms quoted in Lisbon, Madrid and Milan stock markets, displayed higher firm value than non-derivative hedgers, following the statistical analysis displayed in previous studies. I tried to find evidences that hedging the interest rate and foreign currency risks increase the firm's value, by using the Tobin's Q as a proxy for the firm's value.

The main reasons why non-financial firms hedge their financial risks are largely studied, either in UK (Clark and Judge, 2006; Judge, 2006) or in USA markets (Nance et al., 1993; Graham and Rogers, 2002), but also in Portugal (Mota, 2002; Ferreira and Mota, 2005), Spain (González et al., 2007), Italy (Bodnar et al., 2000; Bodnar et al., 2008) or even including several countries all over the world (Bartram et al, 2006; Foo and Yu, 2005).

The reasons for hedging are mainly the same: costs of financial distress, foreign currency transactions level, operating cash flow volatility, underinvestment's costs and convexity of taxes function. Even though, there are some specific differences between each country. For instance, UK firms are much more sensible to foreign currency hedging than USA. Belghitar et al. (2008) showed that 70.4% of their UK firms sample was classified as

foreign currency hedgers, while Allayannis and Ofek (2001) reported that only 44% of US firms used FC derivatives.

In this study, I started from the point where hedging reasons are already known. I only analyzed financial risks and the hedging firm definition means non-financial Foreign Currency (FC) and Interest Rate (IR) risks hedging firms.

To test the hypothesis that hedging with derivatives increases firm's value, I separated the analyzes according to three samples/subsamples: (1) full sample, including non-financial firms quoted in Lisbon, Madrid and Milan stock markets; (2) Iberian sample, including non-financial firms quoted in Lisbon and Madrid stock markets; (3) Italian sample, including non-financial firms quoted in Milan stock markets.

In each sample/subsample, I analyzed 8 different combinations of hedging/non-hedging sample (Models), as following described: (1) Model 1 includes in hedging sample all interest rate and/or foreign currency hedgers; (2) Model 2 includes in hedging sample all derivative interest rate and/or foreign currency hedgers; (3) Models 3 and 4 include in hedging sample all derivative foreign currency hedgers; (4) Model 5 includes in hedging sample only derivative foreign currency hedgers; (5) Models 6 and 7 include in hedging sample all derivative interest rate hedgers; (6) Model 8 includes in hedging sample derivative interest rate only hedgers (as described in Appendix 2).

As in previous studies (Allayannis and Weston, 2001; Kapitsinas, 2008), I started by a univariate analysis setting the hypothesis that derivative IR (FC) hedgers determine higher firm's values than non-derivative hedgers. To infer that hedging increases the value of the firm, we need to exclude the effect of other variables that could impact on firm's value, measured by the Tobin's Q. To reach these conclusions, as in some other studies (Mackay and Moeller, 2007; Belghitar et al., 2008), I used a multivariate statistical approach, based on several variables as following described.

***Variables description**:*

Tobin's Q, the proxy for the firm value, is the dependent variable defined as: (1) Tobin's Q1, the sum of total assets and market value of equity minus the book value of equity, all divided by total assets (Jin and Jorion, 2006; Belghitar et al., 2008; Pramborg, 2004); (2) Tobin's Q2, computed as the market value for the firm to the book value of total assets (Mackay and Moeller, 2007). I also used a third definition for Tobin's Q (Q3), as market value of equity to book value of equity (Kapitsinas, 2008) and the results were similar to Tobin's Q2 (Appendix 4 - Panels A, B and C).

For the three definition of Tobin's Q (Q1, Q2 and Q3), the Models have been estimated in three samples/subsamples separately as above described (full sample, Iberian subsample and Italian subsample).

To infer that hedging increases firm's value we have to exclude the effect of all other variables that could impact on firms' value (Tobin's Q). These control variables were used as independent variables in a multivariate approach. In common with several previous studies, I control for (1) *Size*, (2) *Profitability*, (3) *Leverage*, (4) *Investment grow*, (5) *Access to Financial Markets*, (6) *Industrial Diversification* and (7) *Geographical Diversification* as following explained:

1. *Size*:

There is no clear evidence about size influence on firm's value. According to Peltzman (1977) analysis, size leads to a higher efficiency. Also, there are several previous studies consistent with the fact that firm's size tends to lead to use more likely derivatives because of their economies of scale in hedging costs. Ross (1996) defended that economies of scale exist in hedging. His results were confirmed by Tufano (1996), Mian (1996) and Berkman and Bradbury (1996). Dolde (1993) concluded that large firms would use more derivatives because of their higher investment in personnel, training and software to set up an in-house risk management program.

Even though there are some evidences that small firms would better need from derivatives hedging financial risks than the biggest ones which have naturally offsetting positions in their vast operations that mitigate financial risks (Crabb, 2003). According to this author, the only definitive tool for financial risk management available to small business is the financial derivatives. However, some studies indicate that smaller businesses do not use derivatives as extensively as large ones. Some reasons are referred to explain this behavior, as hedging costs and treasurer academic qualification.

In my work, I decided to control the effect of Size in firm's value using natural logarithm of total Assets as a proxy for it. Allayannis and Weston also used the natural log of Total Assets to control the effect of size and alternatively also used the log of total sales and the log of capital expenditures; the results were very similar.

2. *Profitability*:

It is expectable that firm's profitability has a positive impact on firm's value. So I expect to conclude that if hedgers are more profitable, as several previous studies had

evidenced, these firms would have higher Tobin's Q. Profitability was used as a control variable in previous studies. I used Return on Capital Employed (ROCE), as Belghitar et al. (2008), defined as the pre-tax profit plus total interest charges as a portion of total capital employed plus borrowing repayable within 1 year less total intangibles, to analyze profitability variable. A positive sign for the estimated coefficient is expected.

3. *Leverage*:

The structure of capital tends to affect the firm's value. To control for the effect of Leverage I used the Financial Leverage Ratio, calculated as the book value of total debt divided by the book value of total debt plus the market value of equity as Belghitar et al. (2008). Allayannis and Weston (2001) also used Leverage as a control variable, but defined it as the long-term debt divided by shareholders equity. Firms with high leverage tend to hedge more (Dolde, 1995), which must represent a higher Tobin's Q. A positive sign for the relation is expected.

4. *Investment Grow*:

Because hedging firms are more likely to have larger investment opportunities (Allayannis and Weston, 2001; Belghitar et al., 2008), such control is important. Additionally, Myers (1977) and Smith and Watts (1992) have also argued that there are evidences that firm's value also depends on the future investment opportunities. Regarding this reference, I also decided to include this variable. Similar to Yermack (1996), Servaes (1996) and Allayannis and Weston (2001), I used the ratio of capital expenditure to sales as a proxy for investment opportunities. Some previous studies had also used R&D expenditures as a proxy for investment opportunity. As I couldn't find consistent data for R&D, I assume zero for its value. A positive relation to the firm's value is expected.

5. *Access to Financial Markets*:

If firms have limited access to financial markets, their Q ratios may be higher because they undertake only positive net present value (NPV) projects. To proxy for the ability to access to financial markets, I chose the dividend yield as Belghitar et al. (2008). Some studies used a dividend dummy (Allayannis and Weston, 2001). I would prefer to use dividend yield, since with this ratio I can get a representative value of the relationship between dividend and share price for each company. I therefore expect a negative coefficient. Both, dividend yield or dummy dividend, are referred in previous studies with negative relation expectation.

6. Industrial Diversification:

Several theoretical arguments suggest that diversification increases value (Williamson, 1970; Lewellen, 1971), while other arguments suggest that diversification is negatively related to the firm's value, due to the agency problems between managers and shareholders (Jensen, 1986). Even though, there are substantial empirical evidences suggesting that industrial diversification is negatively related to firm's value (Berger and Ofek, 1995; Lang and Stulz, 1994; Servaes, 1996; Allayannis and Weston, 2001).

To control for the industrial diversification, I used a dummy variable that equals 1 if the firm operates in more than one segment and 0 otherwise. In full sample, 59.52% of the firms are diversified across industries. Allayannis and Weston (2001) found in their sample a 63% of the firms that diversified industrial segments. A negative relation is expected.

7. Geographic diversification:

Several previous studies suggest that operating in several countries increases firm's value (Morck and Yeung, 1991; Bodnar et al., 2000). Considering foreign sales as operations abroad, I choose the foreign sales to total sales ratio as a proxy for geographic diversification. In my study, abroad doesn't mean necessarily using a currency different from euro, since I could not find this information properly separated for all sample firms, even in Datastream Database or in the annual reports. Some of these foreign sales refer to an EMU country. This ratio was also used in several previous studies (Allayannis and Weston, 2001; Belghitar et al., 2008). A positive relation is expected.

Table 1 presents the independent variables and the expected signs for the relationship between them and the firm's value.

Table 1
Variables - expected relation with Tobin's Q

Variables	Proxy	expected relation
Hedging measure	Dummy: 1 for hedging firms and 0 for non-hedging ones, considering the 8 chosen Models, described in Appendix 2.	Positive
Size	Natural log of Total assets	Ambiguous
Profitability	ROCE - Return On Capital Employed	Positive
Leverage	Book value of total debt as a proportion of the book value of total debt plus the market value of equity.	Positive
Investment Grow	Ratio of capital expenditure to total sales	Positive
Access to financial markets	Dividend Yield	Negative
Industrial Diversification	Dummy: 1 if the firm operates in more than one business segment and 0 if doesn´t.	Negative
Geographic Diversification	Foreign sales divide by total sales for the year. Foreign means out of the country where firm is being quoted.	Positive

Table 1 resumes the expected relationship between dependent variable, Tobin's Q, and all variables used as independent ones in a Multivariante approach. The definition of variables are presented in Appendix 1.

3. EMPIRICAL STUDY

A. Sample Description and source of data

The sample includes all 336 non-financial firms quoted in Lisbon, Madrid and Milan stock markets, in 2006. I only chose non-financial firms because the financial ones are usually both users and intermediaries in derivative transactions. Due to the fact that they often act as market makers, their motives and behavior are normally very different from those of non-financial firms and could bias results from empirical analysis.

Since the International Financial Reporting Standards (I.F.R.S.) impose firms to report the information of hedging activities and the derivative usage in their annual reports, it is easier to get qualified and standard hedging activity information. All firms in the three analyzed countries, Portugal, Spain and Italy were obliged to reflect IFRS rules in their annual reports. All data included in my tests was collected from 2006 annual reports and Datastream database.

Firstly, I started to analyzing the Iberian market (non-financial firms quoted in Lisbon and Madrid stock markets), due to their proximity and because there are several firms working in both markets. As the sample dimension wasn't big enough to perform statistical

tests and inference, I decided to include another European country that I thought could be the most similar one in terms of hedging firm's behavior, and the choice was Italy.

This study classifies as IR (FC) hedgers firms those that clearly refer this matter in their 2006 annual report. I found, in general, that non-financial firms use derivatives to reduce the financial risk exposure, rather than to speculate.

Table 2 presents data about the number of FC (IR) hedgers amongst the sample of 336 firms. 73.8% of these firms hedge and 91.1% of hedgers are derivative users (Panel A). About 61.9% of derivative users are classified as both foreign currency and interest rate hedgers (Panel B). While 15.5% of them only hedge foreign currency exposure, 22.6% hedge exclusively interest rate exposure (Panel C).

Panel D shows that 52.1% of the firms in my sample are classified as derivative foreign currency hedgers, whereas 56.8% uses interest rate derivatives. Regarding the full sample data, I found that IR hedging is more important than FC hedging; 56.8% of firms are IR derivative hedgers, while only 52.1% hedge their foreign currency risks. This difference in favor of IR hedging is verified in the three analyzed markets. Even though, in Spain the difference is less significant. I also provide information from UK market and in this case FC hedging is much more important than IR hedging. Belghitar et al. (2007) report that 70.4% of UK firms are classified as FC derivative hedgers, while only 44.4% hedge their IR risks with derivatives.

Table 2

Foreign Currency (FC) and Interest Rate (IR) Hedging

Panel A: FC (IR) hedgers

	Full Sample	FC(IR) hedgers		Derivatives FC (IR) hedgers	
		Nr	%	Nr	%
Portugal	40	28	70.0%	25	89.3%
Spain	119	91	76.5%	77	84.6%
Italy	177	129	72.9%	124	96.1%
Total	336	248	73.8%	226	91.1%

Panel B: Derivative FC (IR) hedgers, amongst derivative hedgers

	Derivative FC(IR) Hedgers	FC hedgers		IR hedgers		FC + IR hedgers	
		Nr	%	Nr	%	Nr	%
Portugal	25	19	76.0%	23	92.0%	17	68.0%
Spain	77	63	81.8%	64	83.1%	50	64.9%
Italy	124	93	75.0%	104	83.9%	73	58.9%
Total	226	175	77.4%	191	84.5%	140	61.9%

Panel C: Derivative FC or IR only hedgers, amongst derivative hedgers

	Derivative FC(IR) Hedgers	FC Only hedgers		IR only hedgers	
		Nr	%	Nr	%
Portugal	25	2	8.0%	6	24.0%
Spain	77	13	16.9%	14	18.2%
Italy	124	20	16.1%	31	25.0%
Total	226	35	15.5%	51	22.6%

Panel D: Derivative FC (IR) hedgers, amongst full sample

	Full Sample	FC hedgers		IR hedgers		FC + IR hedgers	
		Nr	%	Nr	%	Nr	%
Portugal	40	19	47.5%	23	57.5%	17	42.5%
Spain	119	63	52.9%	64	53.8%	50	42.0%
Italy	177	93	52.5%	104	58.8%	73	41.2%
Total	336	175	52.1%	191	56.8%	140	41.7%

Panel E: Derivative FC or IR only hedgers, amongst full sample

	Full Sample	FC Only hedgers		IR only hedgers	
		Nr	%	Nr	%
Portugal	40	2	5.0%	6	15.0%
Spain	119	13	10.9%	14	11.8%
Italy	177	20	11.3%	31	17.5%
Total	336	35	10.4%	51	15.2%

Table 2 presents data on the number of Foreign Currency (FC) and Interest Rate (IR) hedgers amongst the sample of 336 non-financial firms quoted in Lisbon, Madrid and Milan stock exchange, in 2006. A firm is defined as a FC (IR) hedger if it provides a qualitative disclosure of any FC(IR) hedging activity on its Annual Report. Panel A provides data on the number of FC (IR) hedging and the FC(IR) derivatives hedging. A firm is defined as a derivatives hedger if this information is clearly referred on its Annual Report. Panel B presents information about FC, IR and FC + IR derivatives hedging firms, amongst the 226 non-financial Derivative Hedgers, while Panel C displays information about FC and IR only hedgers. Panels D and E presents the same information as Panels B and C, but amongst the 336 non-financial firms.

Table 3 summarizes statistical information about variables used in econometric analysis. I compute Tobin's Q for 336 firms (the number of observations). In this study I included three different Tobin's Q definitions used as a proxy for firm value (Q1, Q2 and Q3). The Q Median displays the following values: Q1(1.40), Q2(0.74) and Q3(2.20) which are smaller than their Means Q1(1.64), Q2(1.00) and Q3(2.91), indicating that the distribution of Tobin's

Q is skewed to the left. This conclusion is consistent with the findings in other previous studies, as Belghitar et al. (2005) and Allayannis and Weston (2001).

Like other empirical studies, I used the natural log of Tobin's Q as dependent variable in the linear regression models. With natural log we can interpret the changes in Tobin's Q value as an approximate percentage change in the firm's value, which make it easier to understand.

Table 3
Variables - Summary Statistics

Variables	N	Mean	Median	Std.Dev	Min	Max
Tobin's Q1	336	1.64	1.40	1.08	0.476	13.01
Tobin's Q2	336	1.00	0.74	1.13	0.02	12.27
Tobin's Q3	332	2.91	2.20	3.26	0.00	46.35
Market Value of Equity (millions)	336	5,383	464	24,773	0.42	357,530
Book Value of Equity (millions)	336	10,509	193	156,683	-127	2,869,882
Total Assets (millions)	336	39,277	573	605,022	16.76	11,087,180
Return on Capital Employed - ROCE (%)	330	7.19	6.71	17.31	-108.10	184.38
Leverage (%)	336	30.49	28.61	21.35	0.00	99.52
Investment Grow (%)	332	12.95	5.09	41.76	0.00	667.50
Dividend Yield (%)	327	1.43	0.98	1.68	0.00	8.69
Industry Diversification (dummy)	336	0.60	1.00	0.5	0.00	1.00
Geographic Diversification- Foreign sales ratio (%)	326	33.29	28.47	29.77	0.00	99.39

Table 3 summarizes statistical information about variables used in this study. *Tobin's Q1* is computed as the sum of total assets and market value of equity minus the book value of equity, all divided by total assets. The second definition of *Tobin's Q (Q2) is* market value of the firm divided by the book value of total assets. The third one, *Tobin's Q3* , is market value of equity to book value of equity. *Market Value of Equity* is defined as the share price multiplied by the number of shares in issue (ordinary and preferences) and *Book Value of Equity* is defined as equity capital plus reserves, both used to calculate Tobin's Q variable, as well as total assets. *Total Assets* refers to book value of total assets. *Return on Capital Employed* (ROCE) is calculated as Pre-tax profit plus total interest charges divided by total capital employed plus borrowing repayable within 1 year less total intangibles. *Leverage* is measured as book value of total debt as a proportion of the book value of total debt plus the market value of equity. *Investment Grow* is calculated as a ratio of Capex (Capital Expenditure) to total sales. *Dividend Yield* is the gross dividend divided by share price. *Industry Diversification dummy* takes on the value of 1 if the firm operates in more than one business segment. *Geographic Diversification* is the foreign sales divided by total sales. We consider foreign exportation even if it is refers to an European Economic and Monetary Union (EMU) country.

As stated before, with this work I intend to verify if hedging with derivatives increases firm's value and which kind of hedging risk, interest rate or foreign currency, has higher impact on it. Regarding this matter, each hedging risk was isolated as much as possible, employing several sample variations (Models) as following described:

Model 1: all FC and/or IR hedging firms are defined as hedgers. Non-hedging sample includes all non hedgers;

Model 2: all FC and/or IR derivative hedgers are included in hedging sample. Non-hedging sample includes non-derivative hedgers;

Models 3 to 5: all FC derivative hedgers were included in the hedging sample, with some differences between them. Models 3 and 4 include all FC derivative hedgers in hedging sample, even if they hedge IR risks, and model 5 only includes FC derivative hedgers.

Models 6 to 8: all IR derivative hedgers were included in the hedging sample, with some differences between them. Models 6 and 7 include all IR derivative hedgers in hedging sample, even if they hedge FC risks, and model 8 only includes IR derivative hedgers (see definition in Appendix 2).

When I define FC (IR) hedging as the use of FC (IR) derivatives, then firms that hedge FC (IR) using non-derivatives methods will be effectively defined as non-hedgers, except in Models 4 and 7; in Model 4 non-foreign currency derivative hedgers are out of the non-hedging sample and in Model 7 non- interest rate derivative hedgers are also out of the non-hedging sample.

Hedging condition is a dummy variable with value 1 for the firms that hedge and 0 for non-hedgers.

As mentioned before, I used several control variables to better infer if hedging activity increases the firm's value. Table 4, Panels A and B, presents the Pearson correlation coefficients for the variables used in empirical analysis. Panel A defines Tobin's Q (Q1) as the sum of total assets and market value of equity minus the book value of equity, all divided by total assets and in Panel B I included the second definition of Tobin's Q (Q2), as the market value for the firm to the book value of total assets.

Consistent with *a priori* expectations, the matrix shows that, in Panel A, Profitability (ROCE), Investment Grows (IG) and Geographical Diversification (GD) are positively correlated with Tobin's Q and Dividend Yield (DY) and Industrial Diversification (ID) are negatively correlated. Although Leverage (LEV) is negatively correlated, against our expectation, and firm size (LOGTOTA) has also a negative correlation. However, in this case, the correlation is not statistically significant. In Panel B, I achieved the same results except with Dividend Yield (DY) that is positive correlated with Tobin's Q2, contrary to *a priori* expected results.

In spite of the agreement between expected and observed sign for the correlations, some of them are not statistically significant. For example, the correlation between LOGQ1 and IG, ID, GD and DY is not statistically different from zero, at a 5% significance level. Thus, even confirming the expected sign correlation, results are not statistically significant. I found

the same results for correlation between LOGQ2 and IG, ID and GD; the observed sign correlations were similar to the expectation but without statistical significance.

Table 4
Pearson correlation

Table 4, Panels A and B, report Pearson Corrrelation coefficients for variables used in the tests. LogQ1 is the natural log of sum of total assets and market value of equity minus the book value of equity, all divided by total assets. LogQ2 is the natural log of the market value for the firm to the book value of total assets. Log TotA is a natural log of total assets and represents the firm size. ROCE, is a proxy for profitability. LEV is the Leverage. IG is the Investment Grow. DY is Dividend Yield, the proxy for access to the financial markets. ID is a dummy variable and represents the Industrial Diversification. GD is the Geographic Diversification, calculated as a foreign ratio. The definition of the variables are presented in Appendix 1. The estimations were conducted by using the Eviews econometric software, edition 6.0.

Panel A: Correlation between control variables and Tobin's Q1

Correlation t-Statistic Significance	LOGQ1	LOGTOTA	LEV	IG	ID	GD	DY	ROCE
LOGQ1	1.0000							

LOGTOTA	-0.093107	1.0000						
	-1.638492	-----						
	0.1023	-----						
LEV	-0.581183	0.192409	1.0000					
	-12.51349	3.435465	-----					
	0.0000	0.0007	-----					
IG	0.104224	0.036416	0.100900	1.0000				
	1.836149	0.638480	1.776984	-----				
	0.0673	0.5236	0.0766	-----				
ID	-0.028092	0.212115	0.090192	-0.041416	1.0000			
	-0.492408	3.803102	1.586753	-0.726295	-----			
	0.6228	0.0002	0.1136	0.4682	-----			
GD	0.010394	0.118873	-0.001259	-0.065742	0.042254	1.0000		
	0.182125	2.097703	-0.022057	-1.154398	0.741015	1.0000		
	0.8556	0.0367	0.9824	0.2492	0.4593	-----		
DY	-0.045759	0.319429	0.001379	-0.003217	-0.030345	-0.025562	1.0000	
	-0.802598	5.906275	0.024161	-0.056367	-0.531938	-0.448033	-----	
	0.4228	0.0000	0.9807	0.9551	0.5952	0.6544	-----	
ROCE	0.206756	0.142887	-0.207743	-0.332975	0.050667	0.027059	0.144982	1.0000
	3.702662	2.529531	-3.721128	-6.187274	0.888894	0.474294	2.567418	-----
	0.0003	0.0119	0.0002	0.0000	0.3748	0.6356	0.0107	-----

Panel B: Correlation between control variables and Tobin's Q2

Correlation t-Statistic Significance	LOGQ2	LOGTOTA	LEV	IG	ID	DY	GD	ROCE
LOGQ2	1.0000							

LOGTOTA	-0.136208	1.0000						
	-2.409011	-----						
	0.0166	-----						
LEV	-0.798153	0.192409	1.0000					
	-23.21301	3.435465	-----					
	0.0000	0.0007	-----					
IG	0.041337	0.036416	0.100900	1.0000				
	0.724903	0.638480	1.776984	-----				
	0.4691	0.5236	0.0766	-----				
ID	-0.053550	0.212115	0.090192	-0.041416	1.0000			
	-0.939616	3.803102	1.586753	-0.726295	-----			
	0.3482	0.0002	0.1136	0.4682	-----			
GD	0.026048	0.118873	-0.001259	-0.065742	0.042254	-0.025562	1.0000	
	0.456544	2.097703	-0.022057	-1,154,398	0.741015	-0.448033	-----	
	0.6483	0.0367	0.9824	0.2492	0.4593	0.6544	-----	
DY	0.005330	0.319429	0.001379	-0.003217	-0.030345	1.0000		
	0.093394	5.906275	0.024161	-0.056367	-0.531938	-----		
	0.9257	0.0000	0.9807	0.9551	0.5952	-----		
ROCE	0.167311	0.142887	-0.207743	-0.332975	0.050667	0.144982	0.027059	1.0000
	2.973434	2.529531	-3.721128	-6.187274	0.888894	2.567418	0.474294	-----
	0.0032	0.0119	0.0002	0.0000	0.3748	0.0107	0.6356	-----

B. Firm's Value and Foreign Currency (FC) and Interest Rate (IR) hedging: a Tobin's Q Analysis

Univariate tests:

The most frequent hypothesis the hedging literature deals with is that derivative hedging firms are rewarded by investors with higher valuation compared to non-users and thus a significant difference between hedgers and non-hedgers in terms of firm's value should emerge, as a premium that could be attributed to derivatives usage. In order to empirically check this hypothesis, I performed equality tests for means and medians of the firm's value, given by Tobin's Q (Q1, Q2 and Q3), as well as a comparison of all control variables, defined in Appendix 1, between hedgers and non-hedgers.

The tests were performed separately for full sample and subsamples, Iberian an Italian ones. Moreover, on each sample and subsample, I tested separately derivative hedgers (Model 2), FC derivative hedgers (Model 3) and IR derivative hedgers (Models 6), as shown in Appendix 3 (Panels A, B and C).

Panel A presents the results of the t-test for the equality of means and the Wilcoxon test for the equality of medians between: (i) derivative hedgers and non-hedgers; (ii) FC derivative users and non-FC derivative users; (iii) IR derivative users and non-IR derivative users, to the full sample. Panels B and C present the same tests for Iberian and Italian subsamples, respectively. Referring to each Model, I included four columns. First column displays mean, median, standard deviation and the number of observations (firms) for hedgers. The second one gives the same data for non-hedgers. Column 3 displays differences between hedgers and non-hedgers means and medians. The fourth one refers to the p-values resulting from the tests.

In the full sample (Panel A), the test reveals that the differences in the mean's value of Tobin's Q1 is positive, except for IR derivative hedgers, and statistically insignificant in all the comparisons, whereas with Tobin's Q2 the differences are all negative except for FC derivative hedgers, but also statistically insignificant at a 5% significance level. With Tobin's Q3, the means difference is positive, except in Model 6 and there is also no statistical significance. The means difference in control variables Dividend Yield (DY) and Geographic Diversification (GD) is always positive and statistically significant at 1%, as well as the natural log of Total Assets.

In the Iberian sample, Panel B, the test reveals similar results for the means difference of Tobin's Q (Q1, Q2 and Q3) in comparison to the full sample, Panel A. All results are also

statistically insignificant at a 5% significance level. As in Panel A, the means difference in control variables Dividend Yield (DY), Geographic Diversification (GD) and natural log of Total Assets (Log TotA) are always positive and statistically significant.

In Italian sample, Panel C, the test reveals that the differences in the mean value of Tobin's Q (Q1, Q2 and Q3) are all positive. However none of them are statistically significant, as in full sample and Iberian subsample. The means difference in control variables Total Assets (TotA), Leverage (LEV) and Geographic Diversification (GD) are always positive and statistically significant at 1%, as well as natural log of Total Assets (Log TotA).

The results don't support properly the hypothesis that derivative hedging usage increases the firm's value, comparing with non-derivative hedgers. On that account a multivariate approach is required in order to isolate other factors that usually affect firm's value, as I analyze next.

Multivariate analysis:

As explained before, I examined in a univariate setting the hypothesis that, on average, derivative IR (FC) hedgers determine higher firm's values than non-derivative hedgers. However, to document properly a relationship between the use of derivatives and firm's value we need to control for variables that could impact on firm's value, as described earlier. Regarding this matter, I also tested my hypothesis in a multivariate setting, including the following variables: (1) *Size*, by using the log of total assets (TotA) as a proxy; (2) *Profitability,* using Return On Capital Employed (ROCE) as a proxy; (3) *Leverage* (LEV), using book value of total debt as a proportion of the book value of total debt plus the market value of equity as a proxy; (4) *Investment grow* (IG), using ratio of capital expenditure to total sales as a proxy; (5) *Access to financial markets*, using the Dividend Yield (YD) as a proxy; (6) *Industrial Diversification* (ID) dummy, taking value one if the firm operates in more than one business segment as a proxy and 0 otherwise; (7) *Geographical Diversification* (GD), using the ratio of foreign sales to total sales as a proxy.

The analysis was based on the linear regression model of Allayannis and Weston (2001) formulated as:

$$\begin{aligned} Log Tobin's Q_i &= \alpha + \beta_1 Hedging_i + \beta_2 \log TotA_i + \beta_3 ROCE_i + \beta_4 LEV_i \\ &+ \beta_5 IG_i + \beta_6 DY_i + \beta_7 ID_i + \beta_8 GD_i + \varepsilon_i \end{aligned} \quad (1)$$

Tobin's Q is the proxy for the firm's value and the hedging dummy take different values depending on the sample hedging definition, Models 1 to 8 (Appendix 2). As the Tobin's Q

natural log is considered, hedge dummy coefficient β is interpreted as a premium or a discount, measured in percentage, for firm's value, depending on the positive or negative signal, respectively. The analysis was conducted by the three definitions for the dependent variable, Tobin's Q (Q1, Q2 and Q3). There is a slice difference between first two definitions (Q1 and Q2), as following described:

Tobin's Q1: Defined as the sum of total assets and market value of equity minus the book value of equity, all divided by total assets, represented as:

$$Q1 = \frac{TotA + MVE - BVE}{TotA} = \frac{TotA - BVE}{TotA} + \frac{MVE}{TotA} \quad (2)$$

TotA: Book Value of total Assets

MVE: Market Value of Equity

BVE: Book Value of Equity

Tobin's Q2: Defined as Market Value of the firm divided by the book value of total assets, represented as:

$$Q2 = \frac{MVE}{TotA} \quad (3)$$

MVE: Market Value of Equity

TotA: Book Value of total Assets

Comparing both definitions Q1 includes Q2 on its formulation. I formulated the differences between them as following described:

$$Q1 - Q2 = 1 + \frac{MVE - BVE}{TotA} - \frac{MVE}{TotA} = 1 - \frac{BVE}{TotA} \quad (4)$$

The difference between both formulas comes up from Book Value of Equity (BVE). In the first definition of Tobin's Q (Q1), the results are more influenced by the relationship between Book and Market Value of Equity that can push the firm's value down. With Tobin's Q1, firm's value is not only influenced by market perception but also by book registration.

The third definition of Tobin's Q, Q3, only compares Market Value to Book Value of Equity, and the econometric results were too close to the ones resulting from the Tobin's Q2 as described in the end of this Section.

Econometric Issues:

Heteroscedasticity is a quite common phenomenon in cross-section data and in order to check the error's homokedasticity assumption, I performed the White test. When conclusion points to heteroskedasticity, the White correction for standard errors was performed using Eviews econometric software.

Furthermore, the existence of high correlation among independent variables is a commonly addressed problem in econometric studies, which may leads to inconsistent results. In order to detect any multicollinearity problems, I performed the collinearity diagnostic using SPSS. Regarding collinearity statistics, the Variance Inflation Factor (VIF) always output values <10, meaning a lower intensity correlation between variables. Collinearity diagnostic didn't also display any variance proportion > 0.50 in more than one variable for each dimension. According to the collinearity diagnostic results, the correlation between control variables revealed not troublesome for the estimation results.

Due to the inconclusive results of the Durbin-Watson statistic, I also computed the LM Breusch-Godfrey test and the results point, as expected, for the absence of autocorrelation in the errors. Thus, I just corrected the standard errors by the White procedure.

Results:

The empirical results, according to the equation (1), are presented in Tables 5 to 7, Panels A and B, where the same regression is estimated twice, considering the Q1 and Q2 definitions of Tobin's Q. In each Table, a different sample/subsample was used: (1) Table 5 reports full sample results, including firms from the three stock markets (Lisbon, Madrid and Milan stock markets); (2) Table 6 displays Iberian market (Lisbon and Madrid stock markets) and (3) Table 7 reports the outcome of regression for Milan stock market quoted firms. Under each column the 8 Models results are displayed according to the definitions in Appendix 2.

As observed in previous studies, a statistical significant positive increased value comes up when firms use derivatives on its hedging activities. According to the different Tobin's Q definition, regression results give very different values for R-squared (R^2) as following described: with Q1, the model displays results between 37% and 45%, whereas when using Q2 this value increases and ranges from 65% to 70%. Considering the different definition of Tobin's Q1 and Q2, it seems that used variables better explain the firm's value with Tobin's Q2 as a dependent variable.

Regarding the statistical significance of a dummy hedging coefficient, when full sample is considered, almost all estimated coefficients are statistically significant, except for models

5 and 8, whether using Q1 or Q2 definitions, pointing evidence that hedging activity increased the firm's value. Meanwhile, when I tried to isolate FC (IR) only hedgers (Models 5 and 8) results show non statistical significance in these Models. We could find some explanation in their tiny hedging sample. In 336 firms we only have 35 foreign currency and only 51 interest rate derivative hedgers.

Some differences appear when full sample is separated in two subsamples: Iberian and Italian markets. Using Q1 as a proxy for the firm's value, in Iberian and Italian subsamples, we rarely find a hedging dummy estimated coefficient statistically significant, whereas with Q2 there are several statistical significant coefficients, as described next. Regarding control variables, I observe that variables Leverage (LEV) and Investment Grow (IG) denote in most of 8 Models a statistical significance at 1% level, using Q1 or Q2 definition, within full sample or Iberian and Italian subsamples.

Table 5, Panels A and B, displays a significant premium for hedging firms and derivative users, confirming that foreign currency and interest rate hedging activity is reward by market investors. This Table outcome the test results for full sample, including the three analyzed stock markets: Lisbon, Madrid and Milan.

The significant values, with Q1 and Q2 definitions, were all positive and statistical significant as expected, except in models 5 and 8.

The hedging dummy displays one discount coefficient in Panel A (Model 8) and another in Panel B (Model 5), but without statistical significance. Against my expectation, there is no evidence that derivative hedgers (Models 2 to 8) have higher firm's value than hedgers, whether using derivatives or not (Model 1). Results are probably influenced by the fact that 91.1% of hedging firms are derivative users.

When using Tobin's Q1, derivative hedgers (Model 2) are rewarded with a premium of 4.48%, at a 5% significant level, as well as FC derivative hedgers with statistical significant coefficients of 4.41% and 5.39% (Models 3 and 4). Interest rate derivative hedgers are also rewarded by investors with a statistical significant coefficients of 3.75% and 4.16% (Models 6 and 7), but only at a 10% significance level.

Hedging dummy coefficients are higher when using Tobin's Q2, as following described: hedgers (Model 1) are rewarded with a 10.13% premium, at a 1% significance level, as well as derivative hedgers (Model 2) with a premium of 8.92%. Moreover, FC derivative hedgers are also rewarded by investors with statistical significant coefficients of 7.49% (Model 3) and 10.30% (Model 4), at 5% and 1% level respectively. Interest rate

derivative hedgers are also rewarded with 10.46% and 9.88% premiums, at a 1% significance level.

The estimated coefficients for several control variables output the expected signal, but only some of them are statistically significant. The natural log of total assets (TotA), a proxy for firm size, has a negative sign as in Lang and Stulz (1994), but without statistical significance. Contraire to expected results, on average, firms with higher leverage (LEV) have lower value and the corresponding estimated coefficients are statistically significant in all models (at 1% level), as it was found in Greek stock market analyzed by Kapitsinas (2008). The capital expenditure as a percentage of total sales (IG) is also statistically significant, at 1% level, and the average effect is positive as expected, in line with most previous research. Action in many business segments (Industrial Diversification - ID) and the ratio of foreign sales to total sales (Geographic Diversification - GD) have no statistical significance. The ID coefficients are positively related to the Q1 and Q2, against my expectations.

The GD effect appears negative or positive depending on the analyzed Model. I predicted a GD positive sign as several previous studies. However there are some theories suggesting that Geographic Diversification is an outgrowth of Agency problems, suggesting a negative relation with the firm's value. We can find an explanation for GD inconstancy when full sample is divided: with respect to the Iberian market GD is mostly negatively correlated with firm's value, whereas in Italian market it has a positive correlation (Tables 6 and 7). Dividend Yield (DY) level is almost always negatively related with firm's value, as expected, supporting the ability of the firm to access to the financial markets. Though, its value is not statistically significant. Profitability (ROCE) and firm's value have a positive relationship as theory predicts, except in Model 7, in Panel B, but also without statistical significance.

Table 5

Regression Analysis: non-financial firms quoted in Lisbon, Madrid and Milan Stock Market

Effects of Derivatives use on firm's value - regression results: Table 5 presents the results for regression on the use of derivatives on firm value. The dependent variable is the logarithm of Tobin's Q1, Panel A, and Tobin's Q2, Panel B, as a proxy for firm's value and is calculated as: (1) Q1, division of the sum of total assets and market value of equity minus the book value of equity, all divided by total assets; (2) Q2, Market Value of Equity divided by total assets. Under each column we analyzed a different definition of hedging sample, Models 1 to 8. The variable Hedging is always a dummy variable, equal to 1 when firm hedge according to the question of each Model (hedger, Model 1;derivative hedger, Model 2; FC derivative hedger,Models 3 to 5; IR derivative hedger, Models 6 to 8). TotA is the natural logarithm of total assets, a proxy for firm value. LEV stand for Leverage. IG stands for investment grows. ID dummy stands for diversification in industrial segments. GD stands for geographic diversification. DY stands for dividend yield, a proxy for the access to financial makets. ROCE stands for the return on capital employed, a proxy for profitability. And C stands for the constant. ***, ** and * denote significance at the 1%, 5% and 10%, respectively. t-statistics are based on White standard errors and appears between ( ). The definition of the variables and Models are presented in Appendix 1 and Appendix 2, respectively. The estimations were conducted by using the Eviews econometric software, edition 6.0.

Panel A: Dependent Variable - Tobin's Q1

	FC(IR) Hedgers	***FC(IR) Deriv. Hedgers***	***Foreign Currency (FC) Hedging***			***Interest Rate (IR) Hedging***		
Tobin's Q1	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Hedging dummy	0.0565 **							
	(2.5105)							
Deriv. Hedging dummy		0.0448 **						
		(2.0594)						
FC hedging dummy			0.0441 **	0.0539 **	0.0045			
			(2.1484)	*(2.1771)*	*(0.1409)*			
IR hedging dummy						0.0375 *	0.0416 *	-0.0016
						(1.8897)	*(1.8695)*	*(-0.0737)*
Log TotA	-0.0069	-0.0065	-0.0080	-0.0084	-0.0001	-0.0059	-0.0054	-0.0002
	(-0.5826)	*(-0.5380)*	*(-0.6492)*	*(-0.6507)*	*(-0.0082)*	*(-0.4720)*	*(-0.4581)*	*(-0.0176)*
LEV	-0.0050 ***	-0.0051 ***	-0.0050 ***	-0.0052 ***	-0.0050 ***	-0.0051 ***	-0.0048 ***	-0.0050 ***
	(-9.3222)	*(-9.3017)*	*(-9.3153)*	*(-8.3947)*	*(-9.3000)*	*(-9.2315)*	*(-9.8155)*	*(-9.2964)*
IG	0.0009 ***	0.0009 ***	0.0010 ***	0.0007 ***	0.0009 ***	0.0009 ***	0.0008 ***	0.0009 ***
	(-4.5388)	*(4.4796)*	*(4.5866)*	*(2.8453)*	*(4.2543)*	*(4.2473)*	*(5.2584)*	*(4.2208)*
ID dummy	0.0081	0.0091	0.0068	0.0072	0.0082	0.0073	0.0204	0.0079
	(0.4485)	*(0.5024)*	*(0.3712)*	*(0.3555)*	*(0.4485)*	*0.403517*	*(1.0875)*	*(0.4304)*
GD	0.0000	-0.0001	-0.0001	-0.0002	0.0001	0.0000	0.0001	0.0001
	(-0.1410)	*(-0.2224)*	*(-0.4034)*	*(-0.5526)*	*(0.3699)*	*(-0.0225)*	*(0.1807)*	*(0.3661)*
DY	-0.0086	-0.0086	-0.0083	-0.0089	-0.0074	-0.0085	-0.0070	-0.0074
	(-1.6242)	*(-1.5777)*	*(-1.5449)*	*(-1.5515)*	*(-1.3828)*	*(-1.5673)*	*(-1.2192)*	*(-1.3788)*
ROCE	0.0018	0.0018	0.0018	0.0021	0.0018	0.0019	0.0006	0.0018
	(1.2506)	*(1.2181)*	*(1.1944)*	*(1.1950)*	*(1.1797)*	*(1.2236)*	*(0.6453)*	*(1.1769)*
C	0.3012 ***	0.3112 ***	0.3289 ***	0.3306 ***	0.2947 ***	0.3162 ***	0.2976 ***	0.2962 ***
	(4.6792)	*(4.7611)*	*(4.881)*	*(4.7496)*	*(4.3946)*	*(4.6923)*	*(4.3748)*	*(4.4681)*
Nr of observ.	309	309	309	263	309	309	276	309
Nr of Hedgers	230	210	164	164	33	177	177	46
R2	0.4078	0.4026	0.4027	0.4146	0.3920	0.4005	0.3735	0.3920
Adjusted R2	0.3920	0.3867	0.3868	0.3961	0.3758	0.3845	0.3547	0.3758

Regression Analysis: non-financial firms quoted in Lisbon, Madrid and Milan Stock Market

Panel B: Dependent Variable - Tobin's Q2

	FC(IR) Hedgers	***FC(IR) Deriv. Hedgers***	***Foreign Currency (FC) Hedging***			***Interest Rate (IR) Hedging***		
Tobin's Q2	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Hedging dummy	0.1013 ***							
	(3.1003)							
Deriv. Hedging dummy		0.0892 ***						
		(2.8738)						
FC hedging dummy			0.0749 **	0.1030 ***	-0.0573			
			(2.5283)	*(2.9240)*	*(-1.2485)*			
IR hedging dummy						0.1046 ***	0.0988 ***	0.0169
						(3.6712)	*(3.1111)*	*(0.4866)*
Log TotA	-0.0130	-0.0136	-0.0143	-0.0279	-0.0017	-0.0170	-0.0080	-0.0004
	(-0.4073)	*(-0.4215)*	*(-0.4427)*	*(-0.8107)*	*(-0.0525)*	*(-0.5234)*	*(-0.2213)*	*(-0.0122)*
LEV	-0.0146 ***	-0.0146 ***	-0.0145 ***	-0.0145 ***	-0.0146 ***	-0.0147 ***	-0.0145 ***	-0.0145 ***
	(-17.6112)	*(-17.7609)*	*(-17.6452)*	*(-16.1284)*	*(-17.1985)*	*(-17.7827)*	*(-18.0555)*	*(-17.3368)*
IG	0.0012 ***	0.0012 ***	0.0013 ***	0.0016 ***	0.0012 ***	0.0012 ***	0.0010 ***	0.0012 ***
	(4.7597)	*(4.6747)*	*(5.0105)*	*(3.7592)*	*(4.5890)*	*(4.4843)*	*(4.4694)*	*(4.7884)*
ID dummy	0.0171	0.0191	0.0148	0.0290	0.0145	0.0150	0.0290	0.0178
	(0.6660)	*(0.7400)*	*(0.5666)*	*(1.0081)*	*(0.5517)*	*(0.5913)*	*(1.0968)*	*(0.6678)*
GD	0.0002	0.0001	0.0000	-0.0001	0.0005	0.0001	0.0002	0.0004
	(0.3349)	*(0.1620)*	*(0.0507)*	*(-0.0989)*	*(0.9882)*	*(0.2170)*	*(0.4771)*	*(0.9249)*
DY	-0.0017	-0.0018	-0.0010	0.0010	0.0004	-0.0024	-0.0039	0.0005
	(-0.1626)	*(-0.1711)*	*(-0.0983)*	*(0.0946)*	*(0.0432)*	*(-0.2363)*	*(-0.3359)*	*(0.0477)*
ROCE	0.0010	0.0010	0.0009	0.0018	0.0011	0.0012	-0.0005	0.0010
	(0.5637)	*(0.5358)*	*(0.5004)*	*(0.8210)*	*(0.5469)*	*(0.6093)*	*(-0.4135)*	*(0.5134)*
C	0.2527	0.2737 *	0.2993 *	0.3328 *	0.2541	0.3001 *	0.2468	0.2358
	(1.5942)	*(1.7147)*	*(1.8522)*	*(1.9541)*	*(1.5685)*	*(1.8646)*	*(1.3844)*	*(1.4609)*
Nr of observ.	309	309	309	263	309	309	276	309
Nr of Hedgers	230	210	164	164	33	177	177	46
R2	0.6675	0.6655	0.6628	0.6662	0.6576	0.6711	0.6720	0.6557
Adjusted R2	0.6586	0.6566	0.6538	0.6557	0.6484	0.6623	0.6622	0.6465

To better recognize any differences between evolved countries, I separated full sample in two subsamples: Iberian Market and Italian markets, as above explained. Firms quoted in the Lisbon stock market were not separated from Iberian Market because of its quite small sample. I only got 40 non-financial firms quoted in Lisbon stock market.

Table 6, Panels A and B, refers to the Iberian market. Comparing Iberian market results (Table 6) to the Italian ones (Table 7), I found strong evidences that derivative hedging is much more valuated in Iberian market.

Panel A (Table 6) shows Iberian market with Tobin's Q1 and, contrary to the full sample, the empirical analysis displayed only one statistical significant hedging dummy coefficient, 6.37%, with foreign currency derivative hedging sample (Model 3), at a 10% significance level. Although, in Panel B, using Tobin's Q2 definition, there are as many significant coefficients as in the full sample analysis. Moreover, all significant coefficients output a positive sign, evidencing that Iberian market valuate financial, FC and IR, risk hedgers. As in the full sample, the hedging dummy estimated coefficients with negative signal have no statistical significance.

When using Tobin's Q2, hedging dummy coefficients are almost always statistically significant: derivative hedgers (Model 2) are rewarded with a premium of 11.14%, at 5% significance level. The FC derivative hedgers are also rewarded by investors with statistical significant coefficients of 13.67% (Model 4) and 13.77%, at a 1% level. Moreover, the IR derivative hedgers also display statistical significant premiums of 10.73% (Model 6), at a 1% level, and 10.82% (Models 7), at a 5% level. The hedging dummy coefficient displays a discount value in two situations (Models 5 and 8), but not statistically significant. Also according to my expectation, results evidence that derivative hedgers (Models 2) have higher firm's value than hedgers, whether using derivatives or not (Model 1), with a 1.41% (11.14%-9.73%) higher hedging dummy coefficient.

Analyzing control variables that can also contribute to the firm's value, the following results were found: Log of Total Assets (Log TotA) has a negative sign as in full sample, but statistically significant in three situations, Models 3 and 4 with Tobin's Q1, at a 10% significance level, and in Model 4 with Tobin's Q2, at a 5% significant level; as in full sample (Table 5) firms with higher Leverage (LEV) have lower value and the estimated coefficients are all statistically significant, at a 1% level; the capital expenditure as percentage of total sales (IG) is statistically significant and also positive, as previously expected, and statistically significant, at a 1% level; Industrial Diversification (ID) and Geographic Diversification (GD) have also no statistical significance but while ID is positively related to the Q1 and Q2, GD appears negatively related with firm's value (except in Model 5, with Q2), against the expectations; Dividend Yield (DY) appears negatively related with firm's value, according to the previous expectation, supporting the ability of firms to access the financial markets, but also without statistical significance as in full sample; ROCE is positively related to the firm's value when using Q1 definition (except in Model 7), as theory predicted, but negatively or positively related to the Q2 depending on the Model, without statistical significance as in full sample.

Table 6
Regression Analysis: non-financial firms quoted in Lisbon and Madrid Stock Market

Effects of Derivatives use on firm's value - regression results: Table 6 presents the results for regression on the use of derivatives on firm's value. The dependent variable is the logarithm of Tobin's Q1, Panel A, and Tobin's Q2, Panel B, as a proxy for firm´s value and is calculated as: (1) Q1, division of the sum of total assets and market value of equity minus the book value of equity, all divided by total assets; (2) Q2, Market Value of Equity divided by total assets. Under each column we analyzed a different definition of hedging sample, Models 1 to 8. The variable Hedging is always a dummy variable, equal to 1 when firm hedge according to the question of each Model (hedger, Model 1;derivative hedger, Model 2; FC derivative hedger,Models 3 to 5; IR derivative hedger, Models 6 to 8). TotA is the natural logarithm of total assets, a proxy for firm value. LEV stand for Leverage. IG stands for investment grows. ID dummy stands for diversification in industrial segments. GD stands for geographic diversification. DY stands for dividend yield, a proxy for the access to financial makets. ROCE stands for the return on capital employed, a proxy for profitability. And C stands for the constant. ***, ** and * denote significance at the 1%, 5% and 10%, respectively. t-statistics are based on White standard errors and appears between ( ). The definition of the variables and Models are presented in Appendix 1 and Appendix 2, respectively. The estimations were conducted by using the Eviews econometric software, edition 6.0.

Panel A: Dependent Variable - Tobin's Q1

	FC(IR) Hedgers	***FC(IR) Deriv. Hedgers***	***Foreign Currency (FC) Hedging***			***Interest Rate (IR) Hedging***		
Tobin's Q1	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Hedging dummy	0.0523							
	(1.4066)							
Deriv. Hedging dummy		0.0504						
		(1.5087)						
FC hedging dummy			0.0637 *	0.0614	0.0290			
			(1.8371)	*(1.5947)*	*(0.4768)*			
IR hedging dummy						0.0349	0.0403	-0.0205
						(1.1948)	*(1.2536)*	*(-0.6131)*
Log TotA	-0.0231	-0.0255	-0.0287 *	-0.0303 *	-0.0187	-0.0219	-0.0222	-0.0181
	(-1.4296)	*(-1.5412)*	*(-1.6648)*	*(-1.7427)*	*(-1.1383)*	*(-1.2857)*	*(-1.2774)*	*(-1.0662)*
LEV	-0.0054 ***	-0.0055 ***	-0.0054 ***	-0.0056 ***	-0.0055 ***	-0.0056 ***	-0.0052 ***	-0.0055 ***
	(-6.9768)	*(-7.1346)*	*(-7.0989)*	*(-6.6598)*	*(-7.2649)*	*(-7.1884)*	*(-7.3410)*	*(-7.2164)*
IG	0.0008 ***	0.0008 ***	0.0009 ***	0.0009 ***	0.0008 ***	0.0008 ***	0.0008 ***	0.0008 ***
	(3.5760)	*(3.5163)*	*(3.3943)*	*(3.2238)*	*(3.5532)*	*(3.5376)*	*(3.3602)*	*(3.4806)*
ID dummy	0.0274	0.0311	0.0227	0.0290	0.0313	0.0304	0.0435	0.0280
	(0.8835)	*(1.0084)*	*(0.7355)*	*(0.8215)*	*(1.0119)*	*(0.9850)*	*(1.4508)*	*(0.8664)*
GD	-0.0005	-0.0005	-0.0007	-0.0004	-0.0005	-0.0005	-0.0007	-0.0005
	(-0.9987)	*(-1.1493)*	*(-1.3495)*	*(-0.7096)*	*(-0.9572)*	*(-1.0107)*	*(-1.3779)*	*(-0.9397)*
DY	-0.0119	-0.0119	-0.0135	-0.0118	-0.0095	-0.0115	-0.0115	-0.0100
	(-1.1052)	*(-1.0775)*	*(-1.2076)*	*(-1.0263)*	*(-0.8934)*	*(-1.0306)*	*(-1.0141)*	*(-0.9463)*
ROCE	0.0013	0.0012	0.0012	0.0015	0.0011	0.0013	-0.0003	0.0011
	(0.6911)	*(0.6578)*	*(0.6476)*	*(0.7183)*	*(0.5960)*	*(0.6680)*	*(-0.3394)*	*(0.6050)*
C	0.4511 ***	0.4763 ***	0.5037 ***	0.5000 ***	0.4592 ***	0.4680 ***	0.4598 ***	0.4644 ***
	(4.4130)	*(4.7711)*	*(4.8229)*	*(4.7204)*	*(4.4629)*	*(4.6052)*	*(4.3611)*	*(4.3474)*
Nr of observ.	147	147	147	129	147	147	133	147
Nr of Hedgers	110	95	77	77	14	81	81	18
R2	0.4463	0.4470	0.4530	0.4569	0.4372	0.4417	0.4424	0.4366
Adjusted R2	0.4142	0.4150	0.4213	0.4207	0.4046	0.4093	0.4064	0.4040

Regression Analysis: non-financial firms quoted in Lisbon and Madrid Stock Exchange Market

Panel B: Dependent Variable - Tobin's Q2

	FC(IR) Hedgers	***FC(IR) Deriv. Hedgers***	***Foreign Currency (FC) Hedging***			***Interest Rate (IR) Hedging***		
Tobin's Q2	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Hedging dummy	0.0973 *							
	(1.7361)							
Deriv. Hedging dummy		0.1114 **						
		(2.2827)						
FC hedging dummy			0.1367 ***	0.1377 ***	-0.0171			
			(2.6982)	*(2.6761)*	*(-0.2081)*			
IR hedging dummy						0.1073 ***	0.1082 **	-0.0374
						(2.4291)	*(2.2296)*	*(-0.5079)*
Log TotA	-0.0458	-0.0531	-0.0593	-0.0697 **	-0.0352	-0.0487	-0.0425	-0.0365
	(-0.9165)	*(-1.0531)*	*(-1.1799)*	*(-2.5754)*	*(-0.6953)*	*(-0.9691)*	*(-0.7610)*	*(-0.7245)*
LEV	-0.0157 ***	-0.0158 ***	-0.0156 ***	-0.0154 ***	-0.0159 ***	-0.0161 ***	-0.0157 ***	-0.0159 ***
	(-12.5663)	*(-13.1730)*	*(-13.1918)*	*(-15.3429)*	*(-12.9675)*	*(-13.4082)*	*(-12.9188)*	*(-13.0442)*
IG	0.0018 ***	0.0019 ***	0.0019 ***	0.0019 **	0.0017 ***	0.0018 ***	0.0017 ***	0.0017 ***
	(3.5295)	*(3.5298)*	*(3.4218)*	*(2.2586)*	*(3.6218)*	*(3.5129)*	*(3.1463)*	*(3.6039)*
ID dummy	0.0279	0.0350	0.0169	0.0523	0.0340	0.0331	0.0460	0.0292
	(0.6489)	*(0.8137)*	*(0.3862)*	*(1.0480)*	*(0.7770)*	*(0.7756)*	*(1.0968)*	*(0.6146)*
GD	-0.0001	-0.0003	-0.0006	-0.0004	0.0000	-0.0002	-0.0002	-0.0001
	(-0.1501)	*(-0.3542)*	*(-0.6434)*	*(-0.4356)*	*(-0.0534)*	*(-0.2244)*	*(-0.2072)*	*(-0.1302)*
DY	-0.0050	-0.0058	-0.0091	-0.0016	-0.0010	-0.0064	-0.0090	-0.0015
	(-0.2523)	*(-0.2891)*	*(-0.4432)*	*(-0.1154)*	*(-0.0496)*	*(-0.3162)*	*(-0.4302)*	*(-0.0726)*
ROCE	0.0000	-0.0001	-0.0002	0.0008	-0.0002	0.0001	-0.0017	-0.0003
	(-0.0004)	*(-0.0582)*	*(-0.0971)*	*(0.6918)*	*(-0.0981)*	*(0.0599)*	*(-1.2999)*	*(-0.1300)*
C	0.5335 **	0.5871 **	0.6446 **	0.6450 ***	0.5437 **	0.5782 **	0.5379 *	0.5580 **
	(2.0026)	*(2.2224)*	*(2.4116)*	*(4.2651)*	*(2.0160)*	*(2.1793)*	*(1.8574)*	*(2.0608)*
Nr of observ.	147	147	147	129	147	147	133	147
Nr of Hedgers	110	95	77	77	14	81	81	18
R2	0.6862	0.6903	0.6958	0.7029	0.6781	0.6906	0.7028	0.6787
Adjusted R2	0.6680	0.6724	0.6781	0.6830	0.6594	0.6727	0.6836	0.6601

Table 7, Panels A and B, refers to the non-financial firms quoted in Italian stock market. Results evidence hedging activity is less rewarded by market, either if firms manage their risks with derivatives or not, than Iberian market. A recent survey conducted in Italian market by Bodbnar et al. (2008) concludes that the percentage of firms using derivatives or insurance instruments are mainly the large ones and has not changed noticeably since 1999 (the beginning of the euro period).

In Panel A, with Tobin's Q1 as a dependent variable, the regression results show no statistical significant hedging dummy coefficients. Though, Panel B, with Tobin's Q2 as a

dependent variable, displays positive and statistical significant hedging dummy coefficient at 5% level, in Models 6 and 7, with 9.21% and 7.45% premiums to the IR derivative hedging firms against non-IR derivative users.

Regarding control variables, Panels A and B, point to the following results: (1) Log of Total Assets (Log TotA) has a positive sign, contrary to the full sample and Iberian sub-sample results, but no statistical significance. This result is consistent with the univariate approach (Appendix 3 – Panel C) where Italian market was the only one to display a positive and statistically significant total assets means difference, at a 1% level; (2) firms with higher Leverage (LEV) have also lower value and the associated coefficients are statistically significant in all models, at a 1% level; (3) the capital expenditure as a percentage of total sales (IG) is also statistically significant, at a 1% level, except for the Model 4, and also positive, as expected; (4) Industrial Diversification (ID) has also no statistical significance, but while mostly negatively related to the Q1 (except in Model 7), as expected, is mostly positive related to the Q2 (except in models 4 and 5), against my expectation; (5) Geographic Diversification (GD) has a positive relationship with firm value, as expected, and in some situations is statistically significant at 10% (Models 5, 7 and 8 with Q1; Models 5 and 8 with Q2); (6) Dividend Yield (DY) appears negatively or positively related with Q1, depending on the Model used, and always positively related with Q2, against my expectation, but the estimated coefficients are not statistically significant. This positive relation can be anticipated as a signal on behalf of the firm management of constant future profitability, instead of the interpretation as the ability of the firm to access the financial markets when the relationship between DY and firm's value has a negative sign. Nevertheless, there is none with statistical significance; (7) ROCE is always positively related to the firm value, as the theory predicted. Relating to the Tobin's Q1 definition, ROCE coefficient has statistical significance at 10% (Models 3 to 5 and 8). Moreover, ROCE display statistical significant coefficients, in Models 3 and 4 (with Q2), at a 5% level and at a 10% significant level in Models 3 to 5 and 8 (with Q1) and Models5 and 8 (with Q2).

Table 7
Regression Analysis: non-financial firms quoted in Milan Stock Market

Effects of Derivatives use on firm value - regression results: Table 7 presents the results for regression on the use of derivatives on firm value. The dependent variable is the logarithm of Tobin's Q1, Panel A, and Tobin's Q2, Panel B, as a proxy for firm value and is calculated as: (1) Q1, division of the sum of total assets and market value of equity minus the book value of equity, all divided by total assets; (2) Q2, Market Value of Equity divided by total assets. Under each column we analyzed a different definition of hedging sample, Models 1 to 8. The variable Hedging is always a dummy variable, equal to 1 when firm hedge according to the question of each Model (hedger, Model 1;derivative hedger, Model 2; FC derivative hedger,Models 3 to 5; IR derivative hedger, Models 6 to 8). TotA is the natural logarithm of total assets, a proxy for firm value. LEV stand for Leverage. IG stands for investment grows. ID dummy stands for diversification in industrial segments. GD stands for geographic diversification. DY stands for dividend yield, a proxy for the access to financial makets. ROCE stands for the return on capital employed, a proxy for profitability. And C stands for the constant. ***, ** and * denote significance at the 1%, 5% and 10%, respectively. t-statistics are based on White standard errors and appears between ( ). The definition of the variables and Models are presented in Appendix 1 and Appendix 2, respectively. The estimations were conducted by using the Eviews econometric software, edition 6.0.

Panel A: Dependent Variable - Tobin's Q1

	FC(IR) Hedgers	***FC(IR) Deriv. Hedgers***	***Foreign Currency (FC) Hedging***			***Interest Rate (IR) Hedging***		
Tobin's Q1	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Hedging dummy	0.0389							
	(1.3834)							
Deriv. Hedging dummy		0.0364						
		(1.3302)						
FC hedging dummy			0.0218	0.0449	-0.0081			
			(0.9794)	*(1.5728)*	*(-0.2262)*			
IR hedging dummy						0.0350	0.0325	0.0125
						(1.2529)	*(1.0722)*	*(0.4331)*
Log TotA	0.0016	0.0011	0.0021	0.0001	0.0054	-0.0017	0.0000	0.0067
	(0.1106)	*(0.0789)*	*(0.1481)*	*(0.0059)*	*(0.3882)*	*(-0.1095)*	*(-0.0025)*	*(0.5094)*
LEV	-0.0044 ***	-0.0043 ***	-0.0042 ***	-0.0047 ***	-0.0041 ***	-0.0043 ***	-0.0041 ***	-0.0041 ***
	(-6.1359)	*(-6.1472)*	*(-6.1998)*	*(-6.3640)*	*(-6.0742)*	*(-5.9970)*	*(-5.7616)*	*(-6.0569)*
IG	0.0011 ***	0.0012 ***	0.0012 ***	0.0005	0.0012 ***	0.0012 ***	0.0011 ***	0.0012 ***
	(4.3671)	*(4.3905)*	*(4.7079)*	*(0.6069)*	*(4.6556)*	*(4.2485)*	*(3.9535)*	*(4.4253)*
ID dummy	-0.0054	-0.0062	-0.0059	-0.0189	-0.0075	-0.0084	0.0059	-0.0074
	(-0.2556)	*(-0.2923)*	*(-0.2775)*	*(-0.8126)*	*(-0.3492)*	*(-0.3900)*	*(0.2658)*	*(-0.3393)*
GD	0.0004	0.0004	0.0005	0.0001	0.0006 *	0.0005	0.0007 *	0.0006 *
	(1.4036)	*(1.2861)*	*(1.3184)*	*(0.2675)*	*(1.8763)*	*(1.4179)*	*(1.8868)*	*(1.9096)*
DY	-0.0018	-0.0018	0.7666	-0.0042	-0.0013	-0.0014	0.0020	-0.0016
	(-0.3001)	*(-0.2973)*	*(-0.1882)*	*(-0.7034)*	*(-0.2152)*	*(-0.2400)*	*(0.3238)*	*(-0.2723)*
ROCE	0.0024	0.0025	0.0026 *	0.0030 *	0.0028 *	0.0026	0.0020	0.0028 *
	(1.5426)	*(1.5642)*	*(1.6912)*	*(1.6600)*	*(1.7652)*	*(1.5950)*	*(1.1828)*	*(1.7285)*
C	0.2013 **	0.2062 **	0.2071 **	0.2421 ***	0.1930 **	0.2248 ***	0.1930 **	0.1839 **
	(2.4779)	*(2.4929)*	*(2.5391)*	*(2.6880)*	*(2.3513)*	*(2.4818)*	*(2.0728)*	*(2.4190)*
Nr of observ.	162	162	162	134	162	162	143	162
Nr of Hedgers	120	115	87	87	19	96	96	28
R2	0.4233	0.4227	0.4182	0.4229	0.4152	0.4235	0.4113	0.4158
Adjusted R2	0.3932	0.3925	0.3877	0.3860	0.3846	0.3933	0.3762	0.3852

Regression Analysis: non-financial firms quoted in Milan Stock Market

Panel B: Dependent Variable - Tobin's Q2

	FC(IR) Hedgers	***FC(IR) Deriv. Hedgers***	***Foreign Currency (FC) Hedging***			***Interest Rate (IR) Hedging***		
Tobin's Q2	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Hedging dummy	0.0658							
	(1.5873)							
Deriv. Hedging dummy		0.0554						
		(1.4281)						
FC hedging dummy			0.0051	0.0477	-0.0820			
			(0.1464)	*(1.0908)*	*(-1.5776)*			
IR hedging dummy						0.0921 **	0.0745 **	0.0549
						(2.4722)	*(1.8217)*	*(1.6258)*
Log TotA	0.0028	0.0029	0.0096	-0.0020	0.0034	-0.0101	0.0068	0.0131
	(0.1383)	*(0.143&)*	*(0.4016)*	*(-0.0767)*	*(0.1635)*	*(-0.4515)*	*(0.3113)*	*(0.6746)*
LEV	-0.0128 ***	-0.0127 ***	-0.0123 ***	-0.0127 ***	-0.0122 ***	-0.0128 ***	-0.0128 ***	-0.0124 ***
	(-13.4613)	*(-13.5506)*	*(-13.3599)*	*(-12.1633)*	*(-13.2541)*	*(-13.8068)*	*(-13.7918)*	*(-13.6631)*
IG	0.0016 ***	0.0016 ***	0.0017 ***	0.0016	0.0017 ***	0.0015 ***	0.0013 ***	0.0016 ***
	(4.6052)	*(4.6560)*	*(4.7447)*	*(1.3797)*	*(5.1326)*	*(4.4280)*	*(3.8644)*	*(4.7830)*
ID dummy	0.0065	0.0050	0.0040	-0.0051	-0.0014	0.0000	0.0150	0.0022
	(0.2118)	*(0.1626)*	*(0.1332)*	*(-0.1526)*	*(-0.0466)*	*(0.0007)*	*(0.4673)*	*(0.0719)*
GD	0.0006	0.0006	0.0008	0.0005	0.0008 *	0.0005	0.0008	0.0009 *
	(1.2064)	*(1.1436)*	*(1.4898)*	*(0.8648)*	*(1.7577)*	*(1.0087)*	*(1.3952)*	*(1.7781)*
DY	0.0066	0.0067	0.0074	0.0062	0.0082	0.0072	0.0063	0.0061
	(0.8002)	*(0.8085)*	*(0.7927)*	*(0.5887)*	*(0.9754)*	*(0.8912)*	*(0.6888)*	*(0.7328)*
ROCE	0.0030	0.0032	0.0037 **	0.0040 **	0.0039 *	0.0031	0.0015	0.0036 *
	(1.4471)	*(1.5100)*	*(2.2277)*	*(2.1141)*	*(1.8927)*	*(1.4918)*	*(0.6946)*	*(1.7395)*
C	0.0750	0.0803	0.0576	0.1132	0.0984	0.1488	0.0585	0.0331
	(0.6758)	*(0.7212)*	*(0.4733)*	*(0.8370)*	*(0.8268)*	*(1.2122)*	*(0.4820)*	*(0.3010)*
Nr of observ.	162	162	162	134	162	162	143	162
Nr of Hedgers	120	115	87	87	19	96	96	28
R2	0.6856	0.6840	0.0000	0.6666	0.6862	0.6947	0.6805	0.6835
Adjusted R2	0.6692	0.6675	0.0000	0.6453	0.6698	0.6788	0.6614	0.6670

Additionally, I performed the multivariate approach using a third definition of Tobin's Q (Q3), equal to the ratio of Market Value of equity to the Book Value of equity (MTBV), Appendix 4 – Panels A to C. Negative values of MTBV were removed from the sample, reducing sample from 336 to 332 non-financial firms: one from Iberian subsample and three from Italian subsample.

The results were similar to the ones obtained with Tobin's Q2, giving robustness to my analysis. But the R–squared values are much lower (18% to 31%), indicating a weaker model explanation capacity.

Nevertheless, full sample and Iberian subsample analysis, Panels A and B, output higher statistical significant premiums for the derivative hedging firms, especially for the Iberian market (Panel B), confirming the evidence that Iberian market investors valuate derivative hedging firm activity higher than Italian ones.

In Tables A and B (full sample and Iberian subsample), hedging dummy coefficients are almost all statistically significant, except in Models 5 and 8, as observed with Q1 and Q2. While Table C (Italian subsample) displayed only one statistical significant coefficient, an 8.51% premium at a 10% significant level, with IR derivative hedging firms (Model 6),

Iberian market, Panel B, results evidence my conclusions that investors reward higher derivative FC (IR) hedgers. The FC (IR) derivative hedging dummy displays a 19.85% statistical significant premium, at 1% level. This result is even higher than FC (IR) hedging dummy coefficient, equal to 16.86%, at a 5% significant level, evidencing that derivative hedgers (Models 2) have higher firm's value than hedgers (Model 1). The difference displays a 2.99% (19.85%-16.86%) higher premium in favour of derivative hedgers. The remain Iberian market hedging dummy results point to 16.92% (Model 3) and 20.75% (Model 4) premiums statistically significant at 5% and 1% levels, respectively, for FC derivative hedgers. Regarding interest rate derivative hedgers, result points also to statistical significant premiums of 13.86% and 16.82%, at 5% and 1% level respectively.

Regarding the control variables results, in full sample and Iberian subsample (Panels A and B), coefficient signals are similar to the ones obtained with Tobin's Q1 and Q2, but only Leverage (LEV) and Investment Grow (IG) are statistically significant, both at a 1% level.

Panel C displays the Italian market results. The results displayed in this Panel confirm the evidence that market do not valuate firm's hedging activity. Only the derivative interest rate hedging coefficient dummy (Model 6) has any statistic significance (at a 10% level), with an 8.51% IR hedging premium, in line with Q2 results. And for the control variables only Leverage (LEV) displays statistical significance, at a 1% level.

4. CONCLUSIONS

This study examines the use of FC and IR derivative hedging in a sample of 336 non-financial firms quoted in Lisbon, Madrid and Milan stock markets. It aims to provide an answer to the question of whether using derivatives for hedging financial risks, foreign currency and interest rate, is a valuable adding management activity. Moreover, I tried to find

evidences that derivative hedging activity is rewarded by investors with a higher market valuation, comparing to hedging whether using derivatives or not.

In the empirical analyzes, I use the data getting from Datastream database and 2006 firm's annual reports. Tobin's Q was used as a proxy for firm value, as in many previous studies. Three different definitions for Tobin's Q (Q1, Q2 and Q3) were considered and, even with some differences in terms of significance for the estimated coefficients and R-squared values, the results were consistent.

Using a multivariate approach, empirical tests displayed a 4.48%, 8.92% or 11.88% premium value for derivative hedging firms, depending on the dependent variable definition, Q1, Q2 or Q3.

I found statistical evidence that foreign currency and interest rate derivative hedging usage is positively associated with firm's value.

The full sample of 336 firms was separated in two subsamples: Iberian (Lisbon and Madrid) and Italian (Milan) stock markets.

For the Italian market, there is little evidence that hedging activity is rewarded by investors. I only found statistical evidences related to the IR derivative hedgers, which displayed a statistical significant premium of 9.21% and 7.45% with Tobin's Q1 and Q2 and 8.51% with Tobin's Q3.

On contrary, in Iberian market there are strong evidences that derivative hedging activity is positively associated with firm's value, especially FC derivative hedging. Results output several statistical significant premiums in a range from 6.37% to 20.75%. Moreover, I also found that derivative hedgers (Models 2) have higher firm's value than hedgers, whether using derivatives or not (Model 1), with 1.41% and 2.99% higher hedging dummy coefficients, depending on the Tobin's Q definition. This too tiny difference can probably be explained by the fact that 91.1% of hedging firms are derivative users.

Future research, including last three years, 2007 and 2008, and even 2009 would be interesting, regarding the hedging firm's behaviour during a higher volatility period and its impact on firm's value. As well as the economic sector effect which can influence the hedging level activity.

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APPENDIX

Appendix 1
Variable Definitions

Variables		Variable Description	Source
Tobin's Q1	Q1	Defined as the sum of total assets and market value of equity minus the book value of equity, all divided by total assets.	Datastream
Tobin's Q2	Q2	Market value of equity divided by the book value of total assets.	Datastream
Tobin's Q3	Q3	Market Value of equity divided by the book value of equity (Obtained directly from Datastream database - MTBV).	Datastream
Market Value of Equity	MVE	Share price multiplied by the number of shares in issue (ordinary and preferences).	Datastream
Book Value of Equity	BVE	Equity capital and Reserves.	Datastream
Total Assets	TotA	Book value of total assets.	Datastream
Return On Capital Employed	ROCE	Pre-tax profit plus total interest charges divided by total capital employed plus borrowing repayable within 1 year less total intangibles (Obtained directly from Datastream database - WC08376).	Datastream
Leverage	LEV	Book value of total debt as a proportion of the book value of total debt plus the market value of equity.	Datastream
Investment Grow	IG	Calculated as a ratio of Capex (Capital Expenditure) to total sales	Datastream
Dividend Yield	DY	Gross dividend divided by share prices.	Datastream
Industry diversification	ID	Dummy: Industry diversification dummy takes on the value of the 1 if the firm operates in more than one business segment and 0, else.	Annual Report
Geographic Diversification	GD	Foreign sales divide by total sales (Foreign sales ratio).	Annual Report & DataStream

Appendix 1 presents de definitions of variables employed on the analysis of hedging value for non-financial firms quoted in Lisbon, Madrid and Milan Stock Exchange Markets. It provides the variable's definition and their source. All variables are referred to the year 2006.

Tobin's Q1 is the dependent variable, proxy for the firm value. We used more two definitions to the dependent variable, Tobin's Q2 and Q3. The variables *Market Value of Equity* and *Book Value of Equity* are only used to obtain Tobin's Q value. The following variable: *Total Assets, Return On Capital Employed (ROCE)*, *Leverage, Investment Grow*, *Dividend Yield*, Dummy *Industrial Diversification* and *Geographic Diversification* are used as control variables in the multivariate approach. Following the previous studies, we chose these control variables as the main ones that can also influence firm's value and were also used in previous studies.

Appendix 2
Model Definitions

Models	Model Descriptions
Model 1	All interest rate and/or foreign currency risk hedger firms are defined as hedgers. Non-hedging sample includes all firms that don't hedge interest rate and/or foreign currency.
Model 2	All firms that hedge interest rate and/or foreign currency risks with derivatives are defined as hedgers. In this model, non-hedging sample includes firms that don't hedge or use other kind of hedging methods.
Model 3	All firms that hedge foreign currency risk with derivatives are consider as hedgers. Remain firms were included in non-hedging sample. Foreign currency hedgers using non-derivatives methods will be effectively defined as non-hedgers.
Model 4	All firms that hedge foreign currency risk with derivatives are consider as hedgers. Remain firms were included in non-hedging sample. Foreign currency hedgers using non-derivatives methods will be out of the sample. Which means that Model 4 compares FC derivative hedgers against other kind of risk hedgers and non-hedgers.
Model 5	This Model includes derivative foreign currency only hedgers, excluding all interest rate hedgers from the hedging sample. All other firms were included in non-hedging sample.
Model 6	All firms that hedge interest rate risk with derivatives are consider as hedgers. Remain firms are included in non-hedging sample. Interest rate hedgers using non-derivatives methods will be effectively defined as non-hedgers.
Model 7	All firms that hedge interest rate risk with derivatives are consider as hedgers. Remain firms are included in non-hedging sample. Interest rate hedgers using non-derivatives methods will be out of the sample. Which means that Model 7 compares IR derivatives hedgers against other kind of risk hedgers and non-hedgers.
Model 8	Model 8 includes derivative interest rate only hedgers, excluding all foreign currency hedgers from the hedging sample. All other firms were included in non-hedging sample.

Appendix 2 displays the eight models description used in multivariate approach. Each one has a different combination of firms included in hedging and in non-hedging samples.

Appendix 3
Univariate Approach

Panel A: Full Sample, includes Lisbon, Madrid and Milan Stock Market

	Model 2- Derivative Hedgers				*Model 3 - FC Derivative Hedgers*				*Model 6 - IR Derivative Hedgers*			
	Deriv Hedg	Non-Deriv. Hedg	Diff.	Pval	FC Deriv. Hedger	Non-FC Deriv.Hedg	Diff.	Pval	IR Deriv. Hedger	Non-IR Deriv.Hedg	Diff.	Pval
Tobin's Q1												
Mean	1.66	1.60	0.06	0.616	1.69	1.58	0.11	0.338	1.58	1.72	-0.14	0.274
Median	1.41	1.37	0.04	0.368	1.41	1.39	0.02	0.460	1.41	1.39	0.01	0.534
Stdev	1.17	0.88			1.28	0.81			0.83	1.34		
N	226	110			175	161			191	145		
Tobin's Q2												
Mean	1.00	1.02	-0.02	0.882	1.03	0.97	0.06	0.619	0.91	1.13	-0.22	0.095
Median	0.71	0.75	-0.04	0.569	0.71	0.75	-0.04	0.644	0.71	0.75	-0.05	0.461
Stdev	1.21	0.95			1.33	0.85			0.88	1.38		
N	226	110			175	161			191	145		
Tobin's Q3												
Mean	3.01	2.70	0.31	0.419	3.13	2.51	0.62	0.143	2.76	3.11	-0.35	0.380
Median	2.29	1.87	0.42	0.059	2.36	2.07	0.29	0.074	2.30	1.92	0.38	0.105
Stdev	3.60	2.43			4.01	2.14			2.01	4.42		
N	224	108			174	158			190	142		
TotA (M€)												
Mean	57,007	2,850	54,158	0.442	73,059	2,558	70,501	0.287	66,535	3,373	63,162	0.334
Median	978	208	771	0.000	1,142	259	883	0.000	1,078	259	819	0.000
Stdev	738,000	12,096			838,011	10,307			802,000	13,296		
N	226	110			175	161			191	145		
Log TotA												
Mean	6.10	5.48	0.62	0.000	6.22	5.55	0.67	0.000	6.16	5.56	0.60	0.000
Median	5.99	5.32	0.67	0.000	6.06	5.41	0.64	0.000	6.03	5.41	0.62	0.000
Stdev	0.84	0.74			0.85	0.73			0.85	0.75		
N	226	110			175	161			191	145		
ROCE												
Mean	7.56	6.41	1.15	0.573	9.05	5.14	3.92	0.040	6.67	7.87	-1.20	0.534
Median	7.61	4.84	2.77	0.001	8.00	5.08	2.92	0.000	7.56	5.54	2.02	0.068
Stdev	15.14	21.19			12.42	21.31			13.40	21.46		
N	223	107			173	157			188	142		
LEV												
Mean	32.29	26.78	5.52	0.046	32.04	28.80	3.24	0.171	33.91	25.97	7.94	0.001
Median	31.48	18.52	12.96	0.000	31.48	21.81	9.67	0.010	33.84	19.85	13.99	0.000
Stdev	18.71	25.66			17.87	24.54			18.11	24.33		
N	226	110			175	161			191	145		
IG												
Mean	13.78	11.20	2.57	0.600	10.84	15.29	-4.45	0.333	15.38	9.69	5.68	0.220
Median	5.36	4.40	0.96	0.432	5.36	4.70	0.66	0.736	5.85	4.28	1.57	0.022
Stdev	48.98	19.27			23.70	55.35			53.12	17.14		
N	225	107			175	157			190	142		
DY												
Mean	1.65	0.98	0.67	0.000	1.73	1.10	0.63	0.001	1.69	1.08	0.61	0.001
Median	1.31	0.37	0.95	0.000	1.39	0.48	0.91	0.000	1.30	0.48	0.82	0.001
Stdev	1.75	1.41			1.78	1.49			1.78	1.47		
N	219	108			170	157			186	141		
ID												
Mean	0.62	0.55	0.06	0.290	0.65	0.53	0.12	0.029	0.64	0.54	0.10	0.064
Median	1.00	1.00	0.00	0.290	1.00	1.00	0.00	0.029	1.00	1.00	0.00	0.063
Stdev	0.49	0.50			0.48	0.50			0.48	0.50		
N	226	110			175	161			191	145		
GD												
Mean	38.89	21.83	17.05	0.000	43.25	22.57	20.68	0.000	38.98	25.92	13.06	0.000
Median	39.20	8.34	30.86	0.000	48.14	9.36	38.78	0.000	39.55	13.10	26.45	0.000
Stdev	29.22	27.65			27.72	28.22			28.85	29.43		
N	219	107			169	157			184	142		

Panel A reports univariate statistics results with Tobin's Q (Q1, Q2 and Q3) and control variables used in multivariate approach. In particular it shows the mean, median and standard deviation for derivative hedgers and non-derivative hedgers, including firms quoted in Lisbon, Madrid and Milan stock market. Moreover, it also displays the difference in the means (t-test) and medians (Wilcoxon test) as well as the corresponding p-values. N is the number of observations (firms). Tests were conducted separately for three different Models: Derivative Hedgers (Model 2); FC Derivative Hedgers (Model 3) and IR Derivative Hedgers (Model 6). The definition of variables and models are presented in Appendix 1 and Appendix 2, respectively. Results were produced by using the SPSS, edition 15.0

Panel B: Iberian Sample, includes non-financial firms quoted in Lisbon and Madrid Stock Market

	Model 2- Derivative Hedgers				*Model 3 - FC Derivative Hedgers*				*Model 6 - IR Derivative Hedgers*			
	Deriv Hedg	Deriv Non Hedg	Diff	Pval	FC Deriv. Hedger	Non FC Deriv.Hedg	Diff	Pval	IR Deriv. Hedger	Non IR Deriv.Hedg	Diff	Pval
Tobin's Q1												
Mean	1.77	1.74	0.03	0.881	1.85	1.67	0.18	0.414	1.60	1.96	-0.35	0.122
Median	1.43	1.51	-0.09	0.937	1.44	1.46	-0.02	0.667	1.41	1.51	-0.11	0.545
Stdev	1.50	1.09			1.65	0.97			0.94	1.73		
N	102	57			82	77			87	72		
Tobin's Q2												
Mean	1.09	1.13	-0.04	0.861	1.18	1.03	0.15	0.503	0.90	1.34	-0.44	0.063
Median	0.70	0.85	-0.15	0.714	0.72	0.75	-0.04	0.702	0.70	0.87	-0.17	0.231
Stdev	1.54	1.18			1.69	1.06			0.99	1.78		
N	102	57			82	77			87	72		
Tobin's Q3												
Mean	3.73	3.17	0.56	0.439	3.91	3.12	0.79	0.255	3.14	4.00	-0.86	0.255
Median	2.68	2.22	0.46	0.134	2.67	2.37	0.30	0.234	2.64	2.37	0.28	0.572
Stdev	5.02	2.97			5.52	2.65			2.49	5.89		
N	101	57			82	76			86	72		
TotA (M€)												
Mean	121,054	5,073	115,981	0.427	149,853	4,529	145,324	0.299	140,018	6,322	133,696	0.341
Median	1,695	234	1,461	0.000	2,974	343	2,631	0.000	2,096	517	1,579	0.000
Stdev	1,097,300	16,550			1,223,550	14,613			1,188,068	18,455		
N	102	57			82	77			87	72		
Log TotA												
Mean	6.35	5.62	0.72	0.000	6.48	5.67	0.81	0.000	6.37	5.75	0.61	0.000
Median	6.23	5.37	0.86	0.000	6.47	5.54	0.94	0.000	6.32	5.71	0.61	0.000
Stdev	0.90	0.87			0.89	0.84			0.92	0.89		
N	102	57			82	77			87	72		
ROCE												
Mean	9.66	11.48	-1.82	0.591	10.61	9.97	0.63	0.846	7.95	13.16	-5.21	0.137
Median	8.54	6.73	1.81	0.172	9.40	7.10	2.30	0.032	8.19	7.45	0.74	0.904
Stdev	15.51	26.69			14.49	24.99			10.90	27.29		
N	100	55			81	74			85	70		
LEV												
Mean	34.42	32.59	1.83	0.679	33.08	34.49	-1.41	0.713	37.21	29.59	7.61	0.052
Median	33.90	22.83	11.07	0.110	32.44	30.25	2.19	0.579	34.78	20.76	14.02	0.002
Stdev	19.49	29.82			18.45	28.25			18.44	28.28		
N	102	57			82	77			87	72		
IG												
Mean	14.04	10.95	3.09	0.483	15.25	10.46	4.80	0.255	15.42	9.91	5.51	0.193
Median	6.46	5.28	1.18	0.378	7.03	5.03	1.99	0.076	6.53	5.34	1.19	0.072
Stdev	29.48	19.65			32.04	18.36			31.64	17.75		
N	102	56			82	76			87	71		
DY												
Mean	1.68	0.85	0.83	0.001	1.86	0.88	0.98	0.000	1.74	0.95	0.79	0.002
Median	1.32	0.33	0.99	0.001	1.53	0.33	1.20	0.000	1.27	0.48	0.79	0.003
Stdev	1.78	1.19			1.85	1.22			1.86	1.20		
N	100	56			80	76			86	70		
ID												
Mean	0.68	0.60	0.08	0.314	0.74	0.55	0.20	0.009	0.69	0.60	0.09	0.230
Median	1.00	1.00	0.00	0.313	1.00	1.00	0.00	0.009	1.00	1.00	0.00	0.226
Stdev	0.47	0.49			0.44	0.50			0.47	0.49		
N	102	57			82	77			87	72		
GD												
Mean	34.06	23.60	10.46	0.020	37.21	22.94	14.28	0.001	33.99	25.90	8.09	0.063
Median	30.99	14.17	16.82	0.003	38.93	14.08	24.86	0.000	32.72	15.92	16.80	0.010
Stdev	25.87	27.63			25.27	26.79			24.87	28.67		
N	98	56			79	75			83	71		

Panel B reports univariate statistics results with Tobin's Q (Q1, Q2 and Q3) and control variables used in multivariate approach. In particular it shows the mean, median and standard deviation for derivative hedgers and non-derivative hedgers, including firms quoted in Lisbon and Madrid stock market. Moreover, it also displays the difference in the means (t-test) and medians (Wilcoxon test) as well as the corresponding p-values. N is the number of observations (firms). Tests are conducted separately for three different Models: Derivative Hedgers (Model 2); FC Derivative Hedgers (Model 3) and IR Derivative Hedgers (Model 6). The definition of variables and models are presented in Appendix 1 and Appendix 2, respectively. Results were produced by using the SPSS, edition 15.0.

Panel C: Italian Sample, includes non-financial firms quoted in Milan Stock Market

	Model 2- Derivative Hedgers				*Model 3 - FC Derivative Hedgers*				*Model 6 - IR Derivative Hedgers*			
	Deriv Hedg	Deriv Non Hedg	Diff	Pval	FC Deriv. Hedger	Non FC Deriv.Hedg	Diff	Pval	IR Deriv. Hedger	Non IR Deriv.Hedg	Diff	Pval
Tobin's Q1												
Mean	1.56	1.44	0.12	0.303	1.56	1.50	0.06	0.587	1.56	1.48	0.08	0.490
Median	1.40	1.28	0.13	0.218	1.40	1.33	0.08	0.622	1.41	1.29	0.12	0.149
Stdev	0.79	0.56			0.82	0.61			0.74	0.72		
N	124	53			93	84			104	73		
Tobin's Q2												
Mean	0.92	0.90	0.03	0.836	0.91	0.92	-0.02	0.892	0.91	0.92	0.00	0.984
Median	0.72	0.74	-0.01	0.689	0.71	0.74	-0.03	0.273	0.74	0.74	0.00	0.830
Stdev	0.85	0.60			0.91	0.61			0.78	0.79		
N	124	53			93	84			104	73		
Tobin's Q3												
Mean	2.41	2.17	0.24	0.337	2.48	2.18	0.30	0.187	2.44	2.19	0.25	0.294
Median	2.09	1.70	0.39	0.166	2.05	1.84	0.21	0.150	2.10	1.73	0.37	0.054
Stdev	1.49	1.50			1.58	1.39			1.45	1.56		
N	123	51			92	82			104	70		
TotA (M€)												
Mean	4,324	459	3,865	0.001	5,347	751	4,596	0.004	5,063	463	4,600	0.001
Median	543	207	336	0.000	696	254	441	0.000	713	207	506	0.000
Stdev	13,111	696			14,963	1,532			14,205	666		
N	124	53			93	84			104	73		
Log TotA												
Mean	5.90	5.33	0.57	0.000	5.99	5.44	0.55	0.000	5.98	5.36	0.62	0.000
Median	5.73	5.31	0.42	0.000	5.84	5.41	0.44	0.000	5.85	5.32	0.54	0.000
Stdev	0.74	0.54			0.75	0.59			0.76	0.51		
N	124	53			93	84			104	73		
ROCE												
Mean	5.86	1.05	4.81	0.035	7.68	0.82	6.86	0.001	5.62	2.73	2.88	0.176
Median	6.63	1.82	4.81	0.000	7.37	3.60	3.77	0.001	6.63	3.22	3.41	0.008
Stdev	14.68	11.05			10.14	16.37			15.13	11.68		
N	123	52			92	83			103	72		
LEV												
Mean	30.55	20.53	10.02	0.001	31.12	23.59	7.53	0.007	31.16	22.40	8.76	0.002
Median	29.66	14.51	15.16	0.000	30.10	18.15	11.95	0.003	30.88	16.99	13.89	0.001
Stdev	17.93	18.58			17.39	19.30			17.44	19.22		
N	124	53			93	84			104	73		
IG												
Mean	13.56	11.48	2.08	0.811	6.95	19.83	-12.88	0.129	15.34	9.47	5.87	0.466
Median	4.11	3.57	0.54	0.522	3.97	4.12	-0.14	0.423	4.93	3.52	1.41	0.092
Stdev	60.71	19.04			11.23	74.93			66.21	16.63		
N	123	51			93	81			103	71		
DY												
Mean	1.63	1.12	0.51	0.072	1.61	1.31	0.30	0.251	1.66	1.21	0.45	0.092
Median	1.23	0.37	0.87	0.048	1.26	0.64	0.62	0.164	1.34	0.61	0.73	0.046
Stdev	1.73	1.61			1.73	1.68			1.71	1.69		
N	119	52			90	81			100	71		
ID												
Mean	0.56	0.51	0.06	0.503	0.57	0.52	0.05	0.541	0.60	0.48	0.12	0.126
Median	1.00	1.00	0.00	0.501	1.00	1.00	0.00	0.540	1.00	0.00	1.00	0.126
Stdev	0.50	0.50			0.50	0.50			0.49	0.50		
N	124	53			93	84			104	73		
GD												
Mean	42.79	19.89	22.90	0.000	48.55	22.23	26.32	0.000	43.08	25.93	17.15	0.000
Median	50.09	0.30	49.79	0.000	55.28	6.08	49.19	0.000	51.94	9.00	42.94	0.000
Stdev	31.25	27.82			28.81	29.63			31.28	30.37		
N	121	51			90	82			101	71		

Panel C reports results of univariate statistics with Tobin's Q (Q1, Q2 and Q3) and control variables used in a multivariate approach. In particular it shows the mean, median and standard deviation for derivative hedgers and non-derivative hedgers, including firms quoted only in Milan stock market. Moreover, it also displays the difference in the means (t-test) and medians (Wilcoxon test) as well as the corresponding p-values. N is the number of observations (firms). Tests are conducted separately for three different Models: Derivative Hedgers (Model 2); FC Derivative Hedgers (Model 3) and IR Derivative Hedgers (Model 6). The definition of variables and models are presented in Appendix 1 and Appendix 2, respectively. Results were produced by using the SPSS, edition 15.0.

Appendix 4

Regression Analysis - Dependent variable: Tobin's Q3

Effects of Derivatives use on firm value - regression results: Appendix 4 presents the results for regression on the use of derivatives on firm value. The dependent variable is the logarithm of Tobin's Q3, as a proxy for firm value and is calculated as the Market Value of Equity divided by Book Value of Equity. Under each column we analyzed a different definition of hedging sample, Models 1 to 8. The variable Hedging is always a dummy variable, equal to 1 when firm hedge according to the question of each Model (hedger, Model 1;derivative hedger, Model 2; FC derivative hedger, Models 3 to 5; IR derivative hedger, Models 6 to 8). TotA is the natural logarithm of total assets, a proxy for firm value. LEV stand for Leverage. IG stands for investment grows. ID dummy stands for diversification in industrial segments. GD stands for geographic diversification. DY stands for dividend yield, a proxy for the access to financial makets. ROCE stands for the return on capital employed, a proxy for profitability. And C stands for the constant. ***, ** and * denote significance at the 1%, 5% and 10%, respectively. t-statistics are based on White standard errors and appears between ( ). The definition of the variables and Models are presented in Appendix 1 and Appendix 2, respectively. The estimations were conducted by using the Eviews econometric software, version 6.0.

Panel A: Sample - firms quoted in Lisbon, Madrid and Milan Stock Market

	FC(IR) Hedgers	***FC(IR) Deriv. Hedgers***	***Foreign Currency (FC) Hedging***			***Interest Rate (IR) Hedging***		
Tobin's Q3	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Hedging dummy	0.1224 ***							
	(2.7661)							
Deriv. Hed.dummy		0.1188 ***						
		(2.7324)						
FC hedging dummy			0.0960 **	0.1347 ***	-0.0065			
			(2.4000)	*(2.8628)*	*(-0.1028)*			
IR hedging dummy						0.1062 ***	0.1175 ***	0.0274
						(2.7951)	*(2.6880)*	*(0.5868)*
Log TotA	-0.0044	-0.0068	-0.0066	-0.0100	0.0110	-0.0058	-0.0071	0.0120
	(-0.1160)	*(-0.1792)*	*(-0.1712)*	*(-0.2448)*	*(0.2896)*	*(-0.1521)*	*(-0.1717)*	*(0.3161)*
LEV	-0.0063 ***	-0.0063 ***	-0.0062 ***	-0.0073 ***	-0.0062 ***	-0.0064 ***	-0.0058 ***	-0.0062 ***
	(-5.0316)	*(-5.1323)*	*(-4.9849)*	*(-5.6450)*	*(-4.8941)*	*(-5.1105)*	*(-4.7845)*	*(-4.9187)*
IG	0.0017 ***	0.0018 ***	0.0018 ***	0.0022 ***	0.0015 ***	0.0016 ***	0.0018 ***	0.0015 ***
	(3.0654)	*(3.0870)*	*(3.0978)*	*(3.8018)*	*(2.6525)*	*(2.8377)*	*(3.1482)*	*(2.6359)*
ID dummy	0.0429	0.0453	0.0394	0.0354	0.0427	0.0415	0.0617	0.0444
	(1.1769)	*(1.2431)*	*(1.0695)*	*(0.8670)*	*(1.1603)*	*(1.1382)*	*(1.6484)*	*(1.1902)*
GD	0.0000	-0.0002	-0.0002	-0.0002	0.0003	0.0000	0.0001	0.0003
	(-0.0782)	*(-0.3011)*	*(-0.3745)*	*(-0.2628)*	*(0.4358)*	*(-0.0728)*	*(0.1178)*	*(0.4881)*
DY	-0.0173	-0.0178	-0.0168	-0.0189	-0.0146	-0.0175	-0.0139	-0.0147
	(-1.3769)	*(-1.4020)*	*(-1.3185)*	*(-1.3902)*	*(-1.1445)*	*(-1.3853)*	*(-0.9790)*	*(-1.1536)*
ROCE	0.0022	0.0022	0.0021	0.0020	0.0022	0.0024	0.0002	0.0022
	(0.7949)	*(0.7677)*	*(0.7337)*	*(0.6795)*	*(0.7492)*	*(0.8116)*	*(0.0747)*	*(0.7576)*
C	0.4252 **	0.4559 **	0.4855 **	0.5055 **	0.4102 **	0.4695 **	0.4383 **	0.3981 **
	(2.2676)	*(2.4076)*	*(2.5138)*	*(2.4963)*	*(2.1463)*	*(2.4619)*	*(2.1155)*	*(2.0860)*
Nr of observ.	306	306	306	261	306	306	274	306
Nr of Hedgers	228	208	163	163	32	176	176	45
R2	21%	21%	20%	26%	19%	21%	18%	19%
Adjusted R2	19%	19%	18%	23%	17%	19%	16%	17%

Regression Analysis - Dependent variable: Tobins Q3

Table B: Sample - firms quoted in Lisbon and Madrid Stock Market (Iberian Market)

	FC(IR) Hedgers	***FC(IR) Deriv. Hedgers***	***Foreign Currency (FC) Hedging***			***Interest Rate (IR) Hedging***		
Tobin's Q3	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Hedging dummy	0.1686 **							
	(2.2992)							
Deriv. Hed.dummy		0.1985 ***						
		(3.0697)						
FC hedging dummy			0.1692 **	0.2075 ***	0.1111			
			(2.5131)	*(2.8475)*	*(0.9192)*			
IR hedging dummy						0.1386 **	0.1682 ***	0.0715
						(2.3782)	*(2.6152)*	*(0.8616)*
Log TotA	-0.0556	-0.0691	-0.0674	-0.0698	-0.0422	-0.0550	-0.0553	-0.0372
	(-0.9782)	*(-1.2139)*	*(-1.1540)*	*(-1.1798)*	*(-0.7309)*	*(-0.9621)*	*(-0.8785)*	*(-0.6478)*
LEV	-0.0068 ***	-0.0070 ***	-0.0068 ***	-0.0079 ***	-0.0069 ***	-0.0074 ***	-0.0068 ***	-0.0072 ***
	(-3.7374)	*(-4.0823)*	*(-3.8811)*	*(-4.2664)*	*(-3.8032)*	*(-4.1249)*	*(-3.8516)*	*(-3.9748)*
IG	0.0027 ***	0.0028 ***	0.0027 ***	0.0029 ***	0.0026 ***	0.0026 ***	0.0027 ***	0.0026 ***
	(3.6809)	*(3.6731)*	*(3.5783)*	*(3.5564)*	*(3.6059)*	*(3.6658)*	*(3.3992)*	*(3.6100)*
ID dummy	0.0450	0.0574	0.0345	0.0290	0.0580	0.0545	0.0999	0.0656
	(0.7334)	*(0.9401)*	*(0.5470)*	*(0.3987)*	*(0.9301)*	*(0.8746)*	*(1.6380)*	*(0.9794)*
GD	-0.0002	-0.0005	-0.0007	0.0002	-0.0002	-0.0003	-0.0006	0.0000
	(-0.1936)	*(-0.4884)*	*(-0.6294)*	*(0.1700)*	*(-0.1760)*	*(-0.2457)*	*(-0.4834)*	*(0.0063)*
DY	-0.0281	-0.0296	-0.0310	-0.0376	-0.0201	-0.0280	-0.0246	-0.0197
	(-1.1904)	*(-1.2440)*	*(-1.2555)*	*(-1.5515)*	*(-0.8329)*	*(-1.1442)*	*(-0.9778)*	*(-0.8172)*
ROCE	0.0016	0.0014	0.0013	0.0011	0.0009	0.0017	-0.0009	0.0012
	(0.4724)	*(0.4215)*	*(0.3673)*	*(0.3429)*	*(0.2702)*	*(0.4586)*	*(-0.4259)*	*(0.3501)*
C	0.7853 **	0.8801 ***	0.9284 ***	0.9201 ***	0.8125 ***	0.8480 ***	0.7925 **	0.7799 **
	(2.5859)	*(2.9207)*	*(2.9700)*	*(2.9079)*	*(2.6312)*	*(2.7756)*	*(2.4075)*	*(2.5100)*
Nr of observ.	147	147	147	129	147	147	133	147
Nr of Hedgers	110	95	77	77	14	81	81	18
R2	0.2549	0.2745	0.2585	0.3105	0.2289	0.2503	0.2594	0.2256
Adjusted R2	0.2117	0.2324	0.2155	0.2646	0.1842	0.2068	0.2116	0.1807

Regression Analysis - Dependent variable: Tobins Q3

Table C: Sample - firms quoted in Milan Stock Market (Italian Market)

	FC(IR) Hedgers	***FC(IR) Deriv. Hedgers***	***Foreign Currency (FC) Hedging***			***Interest Rate (IR) Hedging***		
Tobin's Q3	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Hedging dummy	0.0664							
	(1.3388)							
Deriv. Hed.dummy		0.0516						
		(1.0578)						
FC hedging dummy			0.0348	0.0765	-0.0808			
			(0.7617)	*(1.4355)*	*(-1.3378)*			
IR hedging dummy						0.0851 *	0.0601	0.0127
						(1.9458)	*(1.1816)*	*(0.2238)*
Log TotA	0.0303	0.0310	0.0317	0.0254	0.0311	0.0190	0.0180	0.0387
	(1.0076)	*(1.0232)*	*(1.0305)*	*(0.7973)*	*(1.0368)*	*(0.6154)*	*(0.5516)*	*(1.6145)*
LEV	-0.0061 ***	-0.0060 ***	-0.0058 ***	-0.0066 ***	-0.0056 ***	-0.0061 ***	-0.0050 ***	-0.0057 ***
	(-5.0081)	*(-4.9272)*	*(-4.8681)*	*(-5.2355)*	*(-4.7552)*	*(-5.1541)*	*(-3.8982)*	*(-4.2861)*
IG	0.0001	0.0001	0.0002	0.0009	-0.0001	0.0000	0.0002	0.0000
	(0.0667)	*(0.1135)*	*(0.1559)*	*(0.6504)*	*(-0.1139)*	*(0.0123)*	*(0.1503)*	*(0.0072)*
ID dummy	0.0315	0.0297	0.0299	0.0150	0.0234	0.0261	0.0237	0.0276
	(0.8100)	*(0.7638)*	*(0.7676)*	*(0.3673)*	*(0.6009)*	*(0.6780)*	*(0.5757)*	*(0.6800)*
GD	0.0006	0.0006	0.0006	0.0001	0.0009	0.0005	0.0009	0.0008
	(0.9556)	*(0.9438)*	*(0.9273)*	*(0.0711)*	*(1.3657)*	*(0.8732)*	*(1.3597)*	*(1.3311)*
DY	-0.0036	-0.0035	0.7710	-0.0023	-0.0022	-0.0029	0.0012	-0.0034
	(-0.3008)	*(-0.2916)*	*(-0.2183)*	*(-0.1835)*	*(-0.1799)*	*(-0.2380)*	*(0.0893)*	*(-0.3141)*
ROCE	0.0016	0.0018	0.0020	0.0028	0.0027	0.0018	0.0013	0.0023
	(0.7230)	*(0.8068)*	*(0.9193)*	*(1.1961)*	*(1.2384)*	*(0.8201)*	*(0.5452)*	*(0.9370)*
C	0.1976	0.2009	0.2063	0.2533	0.2253	0.2641 *	0.2378	0.1743
	(1.2909)	*(1.3028)*	*(1.3121)*	*(1.5506)*	*(1.4410)*	*(1.6748)*	*(1.4374)*	*(1.3141)*
Nr of observ.	159	159	159	132	159	159	141	159
Nr of Hedgers	118	113	86	86	18	95	95	27
R2	0.2295	0.2261	0.2233	0.2830	0.2295	0.2395	0.1796	0.2206
Adjusted R2	0.1884	0.1848	0.1819	0.2363	0.1884	0.1989	0.1299	0.1791