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SYNERGIES OR OVERPAYMENT IN EUROPEAN CORPORATE M&A*

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Abstract

The purpose of this research is to test whether the price paid for corporate takeovers in Europe is related to the synergies expected or whether bidders are overpaying for acquisitions. We analyzed the relationship between the premium paid in 147 mergers and acquisitions, and the bidders' abnormal returns around the date of the transaction from 1995 to 2004. A quadratic relationship between the premiums and returns was found. When the amount paid in a transaction does not exceed the value of the target organization by more than 39.69–40.03%, the premium becomes a sign of the future synergy and will have a positive effect on the bidders' returns. However, when the premium exceeds these values, the relationship between premiums and returns become negative and therefore the market considers bidders are overpaying. This paper show the importance of the correct valuation of the targets and of the premiums paid to ensure value creation in M&A.

Keywords: Corporate takeovers; premium; overpayment hypothesis; synergy hypothesis.
JEL Code: G34

INTRODUCTION

The Net Value Added of a M&A depends on the premium paid in the transaction, being it greater the higher the capacity of the bidder to complete the transaction at a price that is not greater than the expected cash flows. In this regard, different researchers (such as Hayward and Hambrick, 1997; Grullon et al., 1997; Mueller and Sirower, 2003; Moeller et al., 2005) have analyzed the effect of the premium paid in M&A (price offered above the market value of the target's shares) on bidders' and targets' shareholders return[1].

In 2011, the activity of M&A in Europe increased 1.78% moving more than $51400 million. The mean premium paid achieved a second record since 2002, 22%, only surpassed

[1] As stated by Eckbo´s (2009) review paper of the premium literature, there is a growing research interest in the details of the takeover process from the initial bid through the final contest outcome. Succeeding with a takeover bid is difficult and involves strategies as the target may force the bidder to raise the offer price, reject all offers by the initial bidder in favor of a rival and even reject all bidders.

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by the premium in 2008 which was 23%. However, there have been transactions where the premium has been higher, such as the acquisition of Banco Pastor by Banco Popular (with a premium between 31% and 37%, considering the last quotation or the mean of quotations of the last weeks, respectively) or the acquisition of Bulgari by LVMH with a premium of 60% over the quotation one day before the announcement. This research will allow answering the question, "when the premium is considered too high?" which will be particularly useful for the market analysts, investors, regulators, and the scientific community in general.

To answer this question, the research analyzed the relationship between premiums and bidders' returns. Previous literature has considered a linear relationship between the premium and bidders' returns. However no consensus has been achieved about whether this relationship is positive or negative (Bradley et al., 1983; Antoniou et al., 2008; Varaiya and Ferris, 1987; Sirower, 1997; Schwert, 2003).

In this research, we expanded previous research by proposing a quadratic relationship between the premium and returns in corporate M&As, and subsequently, we empirically tested this relationship. The quadratic relationship allowed determining whether the bidders were overpaying in M&As or whether the premium paid in the deal was adequate to the synergies expected. The existence of this quadratic relationship allowed establishing whether or not the premium is considered too high and is negatively accepted by the market, producing a negative effect on the acquirers' returns.

A sample of 147 non-financial European M&As, from 1995 to 2004, was used to test the relationship between the premiums' and bidders' returns. First, the acquirers' abnormal returns were estimated using event study methodology to later conduct a regression analysis on them.

The results obtained from the event study showed negative and significant abnormal returns, although they were small for acquiring companies. On the other hand, in the regression analysis, a quadratic relationship was found between the premiums' and acquirers' returns. In fact, the results showed a positive influence of the premium on the returns until the premium was considered too high and the relationship became negative. Furthermore, in the sample used, a premium greater than 39.69–40.03% was considered to be too high by the market.

In Section 2 of this paper, reviews on the existing literature regarding the value creation in M&As and the influence that the premium could have on it are presented. Section 3 describes the sample with which the empirical analysis was performed, and shows the main results obtained in the analysis. Finally, the main conclusions are outlined in the last section.

CORPORATE MERGERS AND ACQUISITIONS: REALTIONSHIP BETWEEN PREMIUMS AND BIDDERS' RETURNS

The development of this research is based on two questions: are there abnormal returns obtained by bidders on the announcement of corporate M&A? and, what are the main factors that explain abnormal returns?

Regarding the first question, the results of previous research[2] are not homogeneous and depend on the sector analyzed, the period of time considered, and the study's target countries. Some authors find positive abnormal returns for bidders, while others observe negative or insignificant returns.

[2] See Datta et al. (1992), Rhoades (1994), Bruner (2004), Campa and Hernando (2004) and Eckbo (2009) for a review of the previous research studies.

Regarding the second question, the literature has considered different variables to explain M&A abnormal returns. Some of these factors have been: diversification, be it geographically or by activity (Maquieira et al., 1998; Houston et al., 2001; Slangen, 2006); mean of payment, be it cash or stocks (Hansen, 1987; Sudarsanam and Mahate, 2003); size (Agrawal et al., 1992; Beitel et al., 2004); ownership structure (Bris, 2002; Akhigbe et al., 2007); the consideration of the transaction as hostile (Gregory, 1997, Campa and Hernando, 2004); the fact of having multiple bidders for the same target (Paliwal, 2007; Draper and Paudyal, 2008); or buying a target that belongs to a regulated industry (Campa and Hernando, 2004).

However, along with these variables, the premium paid has been also used to explain bidders abnormal returns in M&A (Flanagan and O'Shaughnessy, 2003; Porrini, 2006).

Previous literature has shown the relationship between the premium and returns:

$$\text{Returns} = f(\text{Premium}, X_1, ..., X_n)$$

Where, $X_1, ..., X_n$ represents all the other variables that could affect the returns.

Some studies showed that the premium positively influences the abnormal returns; whereas, other studies, on the contrary, found a negative relationship. However, a common characteristic of these studies was that they considered a lineal relationship between the premium and returns, according to the following equation:

$$\text{Returns} = \alpha + \beta_1 \text{Premium}_i + \Sigma \beta_n X_{ni} + \varepsilon_i \qquad \text{Equation [1]}$$

The positive or negative influence of the premium over returns can be explained through one of the following hypotheses: the synergy hypothesis, which establishes a positive relationship between the premium and abnormal returns, or the overpayment hypothesis, which identifies a relationship in the other direction.

The synergy hypothesis is based on the fact that the greater the synergies expected from the acquisition the greater the premium the bidder will be willing to pay. Therefore, merger premiums might proxy for the synergies expected between a bidder and its target, and a positive relationship between premium and return is expected (Bradley et al., 1983; Slusky and Caves, 1991) with β_1 being positive in equation (1).

Antoniou et al. (2008) empirically found evidence for this hypothesis, based on a sample of successful UK mergers in the industrial sector between 1985 and 2004. They observed that short-term cumulative abnormal returns (CAR) were positively correlated to the level of the premium paid by the acquirers.

The overpayment hypothesis considers the payment of a premium that exceeds the synergies expected, increasing the likelihood of a value-destroying deal. Therefore, a negative relationship between the premiums and returns is expected. Sirower (1997), Grullon et al. (1997), Mueller and Sirower (2003), and Hayward and Hambrick (1997) observed a significant negative influence of the premium on the acquirers' abnormal returns in the American M&As. In the banking industry, Díaz et al. (2009) also support the overpayment hypothesis when the premium is high[3].

The existing studies have justified the overpayment hypothesis using different arguments: 1) Hubris hypothesis based on overestimation of future profits (Roll, 1986); 2) The need to pay an excessively high price when several acquiring companies compete for the target - *winner's curse* (Ruback, 1982); or 3) agency problems (Shleifer and Vishny, 1997).

[3] However the results obtained for the banking industry cannot be applied to the non-financial industry due to different regulatory restrictions.

Therefore, β_1 would be negative in equation (1), because synergies are no longer considered as the reason for paying a specific premium, but overestimation of synergies (hubris hypothesis), winners' curse, or agency problems.

Finally, other studies failed to observe a significant relationship between the premium and returns in M&A, which could be explained by the joint effect of both the hypotheses[4].

Regarding those two hypotheses, Gupta et al. (2007) considered that merger premiums might be a proxy for either synergies or overpayment. They proposed that the relationship between premiums and returns is asymmetric, and depends whether the acquisitions is value-enhancing or value-reducing. They found that premiums negatively affect acquiring firms when the acquisition is classified as value-enhancing. However, they did not find any relationship between premiums and acquirers' returns in value-reducing acquisitions.

Like Gupta et al. (2007), we think the relationship between premiums and acquirers' returns is asymmetric. However, different from them, we propose that this relationship depends on the magnitude of the premium in such a way that the premium would begin to have a positive influence on the abnormal returns of the bidder, thus, supporting the synergy hypothesis. However, if the premiums were too high, the effect would be negative, as indicated in the overpayment hypothesis. Therefore, a quadratic relationship between the premium and the acquiring company's returns would be expected, and not a linear relationship, as has been suggested by previous corporate M&A literature.

Thus, the equation proposed to relate premiums' and acquirers' abnormal returns can be given:

$$\text{Returns} = \alpha + \beta_1 \text{ Premium}_i + \beta_2 \text{ Premium}^2_i + \Sigma \beta_n X_{ni} + \varepsilon_i \qquad \text{Equation [2]}$$

where, the maximum of the premium is estimated as:

$$\frac{\partial \text{Returns}}{\partial \text{Premium}} = \beta_1 + 2\beta_2 \text{ Premium} = 0$$

$$\text{Premium} = \frac{-\beta_1}{2\beta_2}$$

According to our proposal, we expect a concave down relationship between the premiums' and acquirers' abnormal returns. Therefore, $\beta_1>0$ and $\beta_2<0$, thus:

$$\frac{\partial^2 Returns}{\partial Premium^2} < 0$$

In summary, this research allow to calculate the amount of premium paid in corporate M&A above which the market reflects there is overpayment.

EMPIRICAL ANALYSIS

Data

The empirical analysis was performed for a sample of M&As undertaken among non-financial companies from Western Europe during the period of 1995–2004. The sources of information used in this study were: *Thomson OneBanker*, which provided

[4] Moeller et al. (2005) analyzed the abnormal returns obtained in a sample of US-acquiring companies, showing no significant relationship between the premium paid and abnormal returns. The same result was observed by Cheng and Lung (2004) in 36 mergers among companies in Hong Kong during the period 1986–1994 and by Bharadwaj and Shivdasani (2003) in 115 M&As financed in cash.

information on the characteristics of M&A transactions; *Datastream*, which provided information on the companies' daily stock quotes as well as profit and loss accounts and balance sheets of the companies.

It is necessary to eliminate transactions in which the objective is purely financial and do not pursue objectives inherent to M&A, such as value maximization – through economies of scale, economies of scope and diversification – or the attainment of private benefits. The theory regarding M&A only justifies the significant abnormal returns in transactions that involve a change in control. Thus, researches that do not consider this fact within the sample could produce biased results in the analysis of the abnormal returns obtained with the transaction.

Taking this into account, to identify appropriate transactions, the *Thomson OneBanker* database was used and the following criteria were applied:

1. Both the acquirer and the acquired company must be listed on a European Stock Exchange (805 deals);
2. The acquirer must go from possessing <50% to >50% of the acquired company[5] (386 deals);
3. As the objective consists of studying the premium, there must be information on the bid made (284 deals);
4. The transactions in which there were insufficient data in the estimation period as well as in the event's window were eliminated.

By applying these criteria, a sample of 147 transactions was obtained, of which 50 took place among companies in different countries and 67 took place among companies in different sectors. Table 1 shows the distribution of the transactions according to the country of the acquiring company and the year they were carried out.

Insert Table 1 about here

To verify that the different filters applied in the sample's composition do not affect its representativeness, we have included two columns in table 1 that show distribution of all companies by country and year in the initial sample and the final sample. As such, it could be observed that the analyzed sample followed a similar pattern regarding the representativeness of the countries included and years studied.

Analysis of the Abnormal Returns

This research used the standard methodology of the event study with daily returns to analyze the abnormal returns around a M&A announcement.

To avoid bias when calculating the abnormal returns through the market model[6], we used two alternative measures to obtain the expected return by applying variations of the original model. On one hand, the expected returns were calculated by applying the market model with an alpha equal to zero, and on the other hand, the specification Zero–One of the market model was used.

[5] Beitel et al. (2004) considered only those operations that involved a change in the control and in which the acquiring company went on to hold over 50% after the transaction.

[6] This methodology is based on the calculation of abnormal returns (ARt), defined as the difference between the actual return (Rt) and the expected return (E[Rt]) calculated using the market model. ARt = Rt−E[Rt]. Expected returns were calculated using the market model for a period of 250 days, beginning 270 days prior to the announcement of the transaction and ending 21 days before. Event window to calculate abnormal returns was 41 days, between the 20 days before and after the announcement.

The research used the statistic based on standardized excess returns to test the null hypothesis that the cumulative abnormal returns (CAR) are equal to zero (Dodd and Warner, 1983). This allowed inference of whether the event analyzed had a significant impact on the market value of the companies that have announced a merger or acquisition transaction.

The results obtained regarding the performance of the event study are included in Table 2. For each window, the table contains the average cumulative abnormal return (ACAR), the statistical significance test, and the percentage of firms that had negative CAR.

Insert Table 2 about here

The results indicate the existence of abnormal negative returns on the days around the date of the announcement of the transaction. If we take any of the three proposals of the market model as a reference to calculate the abnormal returns, then a negative and statistically significant reaction is observed in the days around the event date. The window [-1; +1] shows a higher percentage of companies with negative abnormal returns, and this percentage >57% of the cases. Abnormal returns are found between 0.55 and 0.81% in this window, depending on the market model used as a reference. The use of different models allowed us to test the robustness of the results, showing that the statistically significant negative reaction is mainly concentrated in the days closest to the event date. Specifically, return is observed to be significant in all the models in windows [-1; 0], [0], [-1; +1], and [-2; +2]. However, in the windows with a longer period of time, the results depended on the model taken as a reference. The windows [-2; 0] and [-5; +5] were significant for the market model with alpha equal to zero at 0.1%, while windows [-10; 0], [-5; 0], and [-10; +10] were also significant with the market model. Finally, there was no significant reaction in the wider windows, [-20; +20] and [-20; 0], in any of the models analyzed.

Analysis of the Influence of the Premium on the Acquirer's Abnormal Returns

In addition to the event study, a regression analysis was performed to determine the existence of a quadratic relationship between the premiums' and bidders' returns. The dependent variable was the CAR obtained in the windows [-1; +1], [-2; +2], and [-5; +5]. Evidence showed that the most significant market value changes occurred at the merger announcement date or on the day before the announcement. However, windows with a greater number of days were also used. These windows have been selected according to the results presented in Table 2. Window [-5; +5] is the longer length in which the abnormal returns are significant in most of the models.

To empirically test the existence of non-linear relationship between the premiums and returns proposed in equation (2), we estimated the following model including several control variables:

$$CAR_i = \alpha + \beta_1 PREMIUM_i + \beta_2 PREMIUM^2_i + \beta_3 RSIZE_i + \beta_4 RSIZE^2_i + \beta_5 RROA_i + \beta_6 CASH_i + \beta_7 DOMESTIC_i + \beta_8 FRIENDLY_i + \beta_9 DIVER_i + \beta_{10} MULTIBIDDER_i + \beta_{11} REGULATED_i + \Sigma \gamma_j COUNTRY\ DUMMIES_{ji} + \Sigma \gamma_k SECTOR\ DUMMIES_{ki} + \Sigma \gamma_m YEAR\ DUMMIES_{mi} + \varepsilon_i \quad \text{Equation [3]}$$

where, CAR refers to the cumulative abnormal return of the acquiring company for the [-1; +1], [-2;+2], and [-5;+5] windows around the announcement of the M&A. The independent variables are defined as follows:

PREMIUM is the ratio of bid price over the market price of the target organization, 21 days before the announcement. The target market price 21 days prior to the initial merger announcement is used to avoid the influence derived from the announcement (Brewer et al., 2000; Bharadwaj and Shivdasani, 2003; Antoniou et al., 2008). The empirical analysis introduced $PREMIUM^2$ variable in equation (3) to test the quadratic relationship between the premium and abnormal returns of the acquiring company. It is expected that the premium starts by having a positive influence; however, when it reaches higher values, the influence becomes negative. This type of relationship would imply that the PREMIUM variable has a positive coefficient, and the $PREMIUM^2$ variable has a negative coefficient.

RELSIZE is measured by the ratio of the market value of the target over the market value of the acquirer plus the market value of the target, both 21 days prior to the announcement of the transaction. The reduction of the costs of the new organization is easier in the acquisition of smaller organizations. The greater the difference in the size, the greater is the probability that the acquiring company will improve the efficiency and profitability of the target through scale and scope economies offering new services and technologies (Agrawal et al., 1992; DeLong, 2001). In addition, greater size of the target organization makes the integration and the union of different cultures in a merger more difficult and expensive. Hence, either positive or negative relation is to be expected between this variable and the abnormal returns. The combination of the two previous effects might cause a quadratic relationship between the relative size and the abnormal returns of the acquirer. For this reason, we have also introduced the $RELSIZE^2$ variable in equation (3).

RELROA is the relative return on assets between the target company and the acquiring company. It is expected that a transaction will be more successful if the acquiring company is more profitable than the acquired company (Beitel et al., 2004; Louis, 2004), because the former can transfer their greater management abilities to the target organization and improve its efficiency.

CASH is the percentage of the transaction financed with cash with a value ranging from 0 (transaction paid in stock) to 100% (Beitel et al., 2004). According to previous literature, better results can be expected for the stockholders of the acquiring company when the transaction is financed with cash instead of stock (Travlos, 1987; Kohers and Kohers, 2000), and therefore a positive relation between this variable and the abnormal returns is expected. Although several explanations have been given for this effect, the most widely used refers to informational asymmetries (Hansen, 1987).[7]

DOMESTIC is a dummy variable which takes the value of 1 if it is a national transaction and 0 if it is an international one. Domestic M&As offer greater potential for obtaining synergies, whereas international M&As present regulatory or cultural barriers that reduce earnings (Eckbo and Thorburn, 2000; Loree et al., 2000; Campa and Hernando, 2004; Conklin, 2005). Therefore, a positive relationship is expected between domestic acquisitions and abnormal returns (Grullon et al., 1997; Beitel et al., 2004).

FRIENDLY is a dummy variable which takes the value of 1 if the merger was considered friendly by the board of the target firm, and 0 otherwise. The announcement of a hostile acquisition leads to higher returns for the acquirer than the announcement of a friendly M&A. This is because, in hostile transactions, there is a greater substitution of

[7] Other alternative hypotheses focus on the fiscal differences between both the payment methods (e.g. Brown and Ryngaert, 1991), the financial synergies, and capital structure (e.g., Travlos, 1987) or the theory of free cash flow (Jensen, 1986). See Eckbo (2009) for a revision.

executives within the acquired companies which, as a result, improves the management (Gregory, 1997; Loughran and Vijh, 1997; Campa and Hernando, 2004). Therefore, a negative relation is expected between this variable and the bidders' abnormal returns.

DIVER is a dummy variable which assumes the value of 1 if the acquirer and the target main line of business is not in the same two-digit SIC code and 0 otherwise. Several authors have found that M&As which lead to a diversification of activity tend to destroy the value for the acquiring companies (Maquieira et al., 1998; Houston et al., 2001; Flanagan and O'Shaughnessy, 2004).[8] In contrast, those transactions which are concentrated in the same sector tend to be beneficial. This is owing to the fact that they offer a greater possibility of obtaining scale economies, replacing inefficient managers, reducing overinvestment, or increasing market power (Morck et al, 1990; Berger and Ofek, 1995; DeLong, 2001). As such, a negative relation is to be expected between this variable and the bidders' abnormal returns.

MULTIBIDDER is a dummy variable which takes the value of 1 if there are two or more bidders. It is expected that the competing bidders would be more attracted to a target when there are higher potential benefits from the takeover. However, the existence of multiple buyers increases the transaction's cost for the company that finally makes the purchase. This is referred to in the literature as the "winner's curse" (Fishman, 1989; Berkovitch and Narayanan, 1990; Paliwal, 2007; Draper and Paudyal, 2008). Therefore, the expected relationship for this variable can be either positive or negative.

REGULATED is a dummy variable which takes the value of 1 if the industry of the target firm is an industry that is regulated.[9] Campa and Hernando (2004) found that CAR are smaller for European M&As in regulated industries, which might hinder the success of M&As.

Along with the previous variables, other variables were introduced to take into account the acquirer's country, the sector to which the company belongs, and the year in which the transaction took place. Hence, to consider the country, the dummy variables were used. With regard to the distribution by sector, the companies were grouped into eight categories, following SIC codes, with the introduction of the dummy variables. Finally, the year in which the transactions occurred was controlled using time dummy variables.
Table 3 shows a summary of the variables used in the regression analysis.

Insert Table 3 about here

The table shows that on average, the price paid exceeded the price of the shares of the target company by 34%. It also shows that most of the transactions were settled in cash. In fact, only 52 of the 147 transactions analyzed were not fully paid for with cash (20 transactions were undertaken by combining shares and cash, while 32 transactions were completely settled with shares from the acquiring company). It can also be noted that, on average, the target company has a lower ROA and is smaller in size than the acquiring company. In fact, the target company was larger in size in only 4 of the 147 transactions, with the difference in these cases being small in relative terms.

[8] The lack of gains obtained in the formation of conglomerates could be related to the issue of diversification discount. Some studies have documented that diversified conglomerates appear to trade at a discount relative to matched portfolios of pure-play firms (Whited, 2001; Campa and Kedia, 2002; Díaz et al, 2004).

[9] Following Campa and Hernando (2004), mineral industries, primary metal industries, transportation, communication, electricity, gas, and sanitary services were considered as regulated industries (2-digit SIC codes: 10, 13, 33, 40, 44, 45, 48, 49, 60, 61, and 80).

The results assuming a quadratic relationship between the premium and abnormal returns are presented in Table 4. Abnormal returns have been calculated for window [−1,+1] using both the market model as well as the market model with an alpha equal to zero, and the Zero–One market model. As it can be observed in models (a), the PREMIUM variable has a significant positive coefficient, and the $PREMIUM^2$ variable presents a significant negative coefficient. This confirms the quadratic relationship between the premium, and therefore, this relationship may depend on the magnitude of the premium. The premium begins to have a positive influence on the abnormal returns of the acquiring company, supporting the synergy hypothesis. However, when the premium is too high, the effect becomes negative, as put forth in the overpayment hypothesis, giving rise to a non-linear relationship.

Insert Table 4 about here

By using the coefficients from Table 4, the maximum of the premium is between 1.3969 and 1.4003, depending on the model considered[10]. Therefore, according to the results obtained from the sample of firms analyzed, when the amount paid in a transaction does not exceed the value of the target company by more than 39.69–40.03%, the premium would be a sign of future synergy and would have a positive effect on the returns of the bidders. However, if that threshold is surpassed, the acquirer's shareholders suffer the negative effect of overpayment.

Regarding the control variables, CASH variable, which measures the percentage of the transaction financed with cash, positively and significantly influences the abnormal returns for the stockholders of the acquiring company, such as expected.

Moreover, the results also show that the relative size influences the acquirer's abnormal returns through a quadratic relationship. The RELSIZE variable is not significant when introduced alone (models a). However, both variables (RELSIZE and $RELSIZE^2$) are observed to be significant when they are introduced together (models b). Given that the RELSIZE coefficient is positive and the $RELSIZE^2$ coefficient is negative, the relative size starts to have a positive influence on the abnormal returns owing to the economies of scale. However, as the size of the acquiring company increases, the integration problems increase and make the influence of this variable negative. According to our results, the turning point (maximum) in the relationship between the abnormal returns and relative size occurs when the acquired company has a size between 38.5 and 43% of the acquirer, depending on the model.

The standardized coefficients presented between square brackets in table 4 show that the effect that the premium has on the bidders' abnormal returns is more significant than the other variables referring to the deal or the firms' own characteristics.

To test the effect that the premium has on the abnormal returns, taking into account a greater number of days, the analysis for windows [-2; +2] and [-5; +5] was also carried out. Table 5 shows the results for window [-2; +2]. As it can be seen, the quadratic relationship between the premium and abnormal returns is maintained in all of the models considered. The PREMIUM variable continues to be significant and positive and the $PREMIUM^2$, negative and significant. Table 6 shows the results for window [-5; +5]. In this window, the premium has no influence over the acquirer's abnormal returns. In this case, it should be noted that the significance of the abnormal returns becomes lower as the

[10] These values must be taken carefully, because the position of the turning point in the quadratic models is sensitive to the inclusion of other variables in the model (Chen et al., 2004).

number of days included in the window increases (see Table 2). The results of window [-5; +5] could be owing to this fact. In any case, our results show an important effect of the premium on the abnormal returns in the windows in the shortest term.

Insert Table 5 and 6 about here

CONCLUSIONS

The main contributions of this research are the answers to the following questions: Is the price paid for corporate takeovers in Europe adequate to the synergies expected? Are the bidders overpaying for the acquisitions? This study enabled to determine that the answer to both the questions could be yes, but showed that it could depend on the magnitude of the premium paid in the M&A. Thus, the premium becomes relevant to predict the consequences of the deal on the bidders' returns.

Previous studies have considered a linear relationship between the premiums and returns. However, the influence of the premium on the returns might depend on the magnitude of the premium, and thus, a quadratic relationship between both the variables is proposed in this research.

To test this relationship, the bidders' abnormal returns were analyzed around the announcement of the M&A using the event study methodology. Subsequently, a regression analysis of the CAR obtained was performed to determine the importance of the premium therein.

The event study results show the existence of abnormal negative returns for the bidders. In the regression analysis, a quadratic relationship between the premiums and returns was identified. The premium started to have a positive influence on the abnormal returns of the acquirer, according to the synergy hypothesis. However, when the premium was too high, the effect became negative, as established in the overpayment hypothesis. In conclusion, when the amount paid in a transaction does not exceed the value of the target organization by more than 39.69–40.03%, the premium becomes a sign of the future synergy and will have a positive effect on the bidders' returns. Surpassing this threshold will have a negative influence on bidders' returns.

This result makes necessary to reinforce the corporate control mechanisms of the companies to reduce the information asymmetries and agency problems to avoid the payment of a high price being exclusively made owing to the search for private gain by managers.

Finally, the results obtained in the study revealed the need for further in-depth studies on the role that the premium plays in the results of M&As. In this research, the short-term returns of the bidders were focused; however, it would be interesting to analyze the behavior of the bidders who have overpaid in the long term.

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APPENDIX

TABLE 1
Sample Composition

Panel A. M&A classified by country				Panel B. M&A classified by year			
Country	Number of deals	% final sample (147)	% initial sample (805)	Year	Number of deals	% final sample (147)	% initial sample (805)
Belgium	2	1.36%	2.86%	1995	3	2.04%	9.94%
Denmark	6	4.08%	2.98%	1996	6	4.08%	9.32%
Finland	3	2.04%	3.73%	1997	7	4.76%	10.31%
France	18	12.24%	18.39%	1998	12	8.16%	7.45%
Germany	12	8.16%	10.81%	1999	37	25.17%	19.25%
Greece	1	0.68%	1.86%	2000	33	22.45%	16.15%
Ireland-Rep	3	2.04%	1.99%	2001	22	14.97%	10.43%
Italy	3	2.04%	4.84%	2002	12	8.16%	7.70%
Netherlands	5	3.40%	3.85%	2003	11	7.48%	6.83%
Spain	15	10.20%	4.72%	2004	4	2.72%	2.61%
Sweden	8	5.44%	7.70%	Total	147	100.00%	100.00%
Switzerland	6	4.08%	4.35%				
United Kingdom	65	44.22%	31.93%				
Total	147	100.00%	100.00%				

TABLE 2
Abnormal returns (event study)

	Market Model			Market Model (Alfa =0)			Zero/One Market Model		
	ACAR	**Dodd and Warner's test**	**% CAR Negatives**	**ACAR**	**Dodd and Warner's test**	**% CAR Negatives**	**ACAR**	**Dodd and Warner's test**	**% CAR Negatives**
[-20; 0]	0.0077	-0.15	48.98%	0.0127	0.77	44.90%	0.0127	1.03	44.90%
[-10; 0]	-0.0061	-1.40*	50.34%	-0.0035	-0.73	48.98%	-0.0026	-0.28	48.30%
[-5; 0]	-0.0063	-1.40*	53.06%	-0.0049	-0.91	50.34%	-0.0055	-0.74	51.02%
[-2; 0]	-0.0060	-1.76**	50.34%	-0.0053	-1.42*	48.98%	-0.0052	-1.08	50.34%
[-1; 0]	-0.0075	-2.67***	56.46%	-0.0070	-2.39***	56.46%	-0.0065	-1.80**	56.46%
[0]	-0.0049	-2.72***	55.78%	-0.0047	-2.52***	54.42%	-0.0049	-2.11**	55.10%
[-1; +1]	-0.0081	-2.60***	57.82%	-0.0074	-2.26**	57.14%	-0.0055	-1.41*	57.14%
[-2; +2]	-0.0080	-2.35***	57.82%	-0.0068	-1.92**	57.82%	-0.0064	-1.57*	59.18%
[-5; +5]	-0.0087	-2.18**	57.82%	-0.0061	-1.52*	53.74%	-0.0056	-1.27	55.10%
[-10; +10]	-0.0057	-1.75**	49.66%	-0.0007	-0.83	47.62%	0.0034	-0.19	45.58%
[-20; +20]	0.0088	-0.65	55.10%	0.0185	0.63	49.66%	0.0159	0.44	49.66%

***Significance at the 0.01 level, **significance at the 0.05 level, *significance at the 0.1 level.

TABLE 3

Summary statistics of the variables and correlations

Panel a: Definition, statistics and expected relationship of the variables

Variable	Definition	Expected relationship	Observations	Mean	Median	Standard Error	Minimun	Maximun
$PREMIUM_i$	Ratio of bid price over market price of the target organisation 21 days before the announcement.	+ ; -	147	1.340	1.313	0.266	0.832	2.292
$RELSIZE_i$	Market value of the target / (Market value of the acquirer + Market value of the target) (both 21 days before the announcement of the M&A).	+;-	147	0.163	0.132	0.146	0.001	0.657
$RELROA_i$	Target ROA / Acquirer ROA	-	147	0.491	0.842	8.977	-48.733	72.546
$CASH_i$	Percentage of the transaction financed with cash and whose value ranges from 0% (transaction paid in stock) to 100%.	+	147	0.707	1	0.428	0	1
$DOMESTIC_i$	Dummy = 1 if the M&A is domestic and 0 if it is cross border.	+	147	0.660	1	0.475	0	1
$FRIENDLY_i$	Dummy = 1 if the merger was considered friendly by the board of the target firm and 0 otherwise.	-	147	0.633	1	0.484	0	1
$DIVER_i$	Dummy = 1 if acquirer and target main line of business is not in the same two-digit SIC code and 0 otherwise.	-	147	0.435	0	0.498	0	1
MULBIDDER	Dummy=1 if there are multiple bidders and 0 otherwise	+;-	147	0.129	0	0.337	0	1
REGULATED	Dummy = 1 if the industry of the target firm is an industry that is regulated and 0 otherwise.	-	147	0.170	0	0.377	0	1

Panel b: correlations

	PREMIUM	RELSIZE	RELROA	CASH	DOMESTIC	FRIENDLY	DIVER	MULBIDDER	REGULATED
PREMIUM	1								
RELSIZE	-0.3382	1							
RELROA	0.1242	0.0798	1						
CASH	0.1770	-0.4051	-0.1244	1					
DOMESTIC	-0.0627	0.1067	0.1172	-0.1974	1				
FRIENDLY	0.0227	0.0384	0.1702	-0.2948	0.0784	1			
DIVER	0.0909	-0.1289	-0.0413	0.0642	-0.0936	-0.1847	1		
MULBIDDER	0.0106	-0.0250	0.0047	0.1388	-0.023	-0.1691	-0.0111	1	
REGULATED	0.1057	-0.0629	0.0610	-0.0284	-0.019	-0.0307	-0.2514	0.0415	1

TABLE 4

Cross Sectional Regression Analysis. Quadratic Model. Window [-1;+1]

	Market model		Alfa = 0 Market model		Zero-One Market model	
	(a)	(b)	(a)	(b)	(a)	(b)
$PREMIUM_i$	0.4051**	0.3805**	0.4127**	0.3904**	0.4410**	0.4169**
	(2.25)	(2.14)	(2.31)	(2.21)	(2.31)	(2.2)
	[1.55]	[1.45]	[1.59]	[1.50]	[1.60]	[1.51]
$PREMIUM^2_i$	-0.1450**	-0.1359**	-0.1476**	-0.1394**	-0.1578**	-0.1489**
	(-2.38)	(-2.25)	(-2.44)	(-2.32)	(-2.44)	(-2.31)
	[-1.62]	[-1.52]	[-1.66]	[-1.57]	[-1.68]	[-1.58]
$RELSIZE_i$	0.0328	0.2571**	0.0309	0.2336*	0.0530	0.2722**
	(0.68)	(2.07)	(0.64)	(1.89)	(1.03)	(2.05)
	[0.06]	[0.53]	[0.06]	[0.49]	[0.10]	[0.54]
$RELSIZE^2_i$		-0.4631*		-0.4184*		-0.4527*
		(-1.95)		(-1.77)		(-1.79)
		[-0.49]		[-0.44]		[-0.45]
$RELROA_i$	-0.0009	-0.0010	-0.0009	-0.0010	-0.0007	-0.0008
	(-1.3)	(-1.44)	(-1.39)	(-1.51)	(-1.02)	(-1.15)
	[-0.11]	[-0.12]	[-0.12]	[-0.13]	[-0.09]	[-0.10]
$CASH_i$	0.0474***	0.0448***	0.0477***	0.0453***	0.0556***	0.0530***
	(2.75)	(2.63)	(2.79)	(2.67)	(3.04)	(2.92)
	[0.29]	[0.27]	[0.29]	[0.28]	[0.32]	[0.31]
$DOMESTIC_i$	0.0155	0.0125	0.0148	0.0121	0.0169	0.0139
	(0.99)	(0.81)	(0.96)	(0.78)	(1.02)	(0.84)
	[0.10]	[0.08]	[0.10]	[0.08]	[0.10]	[0.09]
$FRIENDLY_i$	0.0021	-0.0001	0.0024	0.0004	0.0011	-0.0010
	(0.13)	(0)	(0.15)	(0.03)	(0.07)	(-0.06)
	[0.01]	[-0.00]	[0.01]	[0.00]	[0.00]	[-0.00]
$DIVER_i$	0.0174	0.0186	0.0177	0.0189	0.0199	0.0212
	(1.24)	(1.34)	(1.27)	(1.37)	(1.34)	(1.43)
	[0.12]	[0.13]	[0.12]	[0.13]	[0.13]	[0.14]
$MULTIBIDDER_i$	-0.0044	-0.0073	-0.0053	-0.0079	-0.0082	-0.0110
	(-0.23)	(-0.38)	(-0.27)	(-0.41)	(-0.4)	(-0.54)
	[-0.02]	[-0.03]	[-0.02]	[-0.03]	[-0.03]	[-0.05]
REGULATEDi	0.0359	0.0344	0.0342	0.0328	0.0285	0.0271
	(1.46)	(1.42)	(1.4)	(1.36)	(1.09)	(1.05)
	[0.19]	[0.18]	[0.18]	[0.17]	[0.14]	[0.14]
CONSTANT	-0.3523**	-0.3413**	-0.3579**	-0.3480**	-0.3976***	-0.3869**
	(-2.46)	(-2.41)	(-2.51)	(-2.47)	(-2.61)	(-2.56)
B-P	0.42	0.53	0.49	0.55	0.80	0.95
F	1.54	1.63	1.56	1.63	1.44	1.52
R^2	0.35	0.37	0.35	0.37	0.33	0.35

B-P is the Breusch-Pagan test, and it is distributed as a chi-square with one degree of freedom. F is F-Statistic. ***Significance at the 0.01 level, **significance at the 0.05 level, *significance at the 0.1 level. t- statistics between brackets. Standardised coefficients between square brackets.

TABLE 5

Cross Sectional Regression Analysis. Quadratic Model. Window [-2;+2]

	Market model		Alfa = 0 Market model		Zero-One Market model	
	(a)	(b)	(a)	(b)	(a)	(b)
$PREMIUM_i$	0.4208**	0.3844*	0.4338**	0.4013**	0.4584**	0.4265**
	(2.11)	(1.97)	(2.2)	(2.07)	(2.15)	(2.03)
	[1.44]	[1.31]	[1.50]	[1.38]	[1.49]	[1.39]
$PREMIUM^2_i$	-0.1444**	-0.1310**	-0.1489**	-0.1369**	-0.1560**	-0.1442**
	(-2.13)	(-1.98)	(-2.23)	(-2.08)	(-2.16)	(-2.02)
	[-1.44]	[-1.31]	[-1.50]	[-1.38]	[-1.48]	[-1.37]
$RELSIZE_i$	0.0598	0.3913***	0.0568	0.3531***	0.0623	0.3525**
	(1.11)	(2.87)	(1.07)	(2.61)	(1.08)	(2.4)
	[0.11]	[0.73]	[0.10]	[0.66]	[0.11]	[0.62]
$RELSIZE^2_i$		-0.6847***		-0.6119**		-0.5993**
		(-2.63)		(-2.37)		(-2.14)
		[-0.64]		[-0.58]		[-0.54]
$RELROA_i$	-0.0005	-0.0006	-0.0005	-0.0007	-0.0002	-0.0003
	(-0.6)	(-0.79)	(-0.73)	(-0.9)	(-0.19)	(-0.33)
	[-0.05]	[-0.06]	[-0.06]	[-0.07]	[-0.01]	[-0.02]
$CASH_i$	0.0498**	0.0459**	0.0502***	0.0468**	0.0600***	0.0566***
	(2.6)	(2.45)	(2.66)	(2.52)	(2.94)	(2.81)
	[0.27]	[0.25]	[0.27]	[0.26]	[0.31]	[0.29]
$DOMESTIC_i$	0.0167	0.0123	0.0155	0.0115	0.0136	0.0097
	(0.96)	(0.72)	(0.9)	(0.68)	(0.73)	(0.53)
	[0.10]	[0.07]	[0.09]	[0.07]	[0.07]	[0.05]
$FRIENDLY_i$	0.0184	0.0152	0.0189	0.0160	0.0161	0.0133
	(1.03)	(0.87)	(1.07)	(0.93)	(0.85)	(0.71)
	[0.11]	[0.09]	[0.11]	[0.10]	[0.09]	[0.07]
$DIVER_i$	0.0210	0.0228	0.0216	0.0232	0.0217	0.0233
	(1.34)	(1.5)	(1.4)	(1.54)	(1.3)	(1.42)
	[0.13]	[0.14]	[0.13]	[0.15]	[0.13]	[0.14]
$MULTIBIDDER_i$	-0.0051	-0.0093	-0.0065	-0.0103	-0.0161	-0.0198
	(-0.24)	(-0.44)	(-0.3)	(-0.49)	(-0.7)	(-0.87)
	[-0.02]	[-0.04]	[-0.02]	[-0.04]	[-0.06]	[-0.08]
REGULATEDi	0.0331	0.0309	0.0302	0.0282	0.0291	0.0272
	(1.21)	(1.16)	(1.12)	(1.07)	(1)	(0.95)
	[0.16]	[0.15]	[0.14]	[0.13]	[0.13]	[0.12]
CONSTANT	-0.3785**	-0.3623**	-0.3880**	-0.3735**	-0.4274**	-0.4132**
	(-2.37)	(-2.33)	(-2.46)	(-2.42)	(-2.51)	(-2.47)
B-P	0.06	0.45	0.13	0.56	0.34	0.96
F	1.60	1.82	1.63	1.80	1.46	1.59
R^2	0.36	0.39	0.36	0.39	0.33	0.36

B-P is the Breusch-Pagan test, and it is distributed as a chi-square with one degree of freedom. F is F-Statistic. ***Significance at the 0.01 level, **significance at the 0.05 level, *significance at the 0.1 level. t- statistics between brackets. Standardised coefficients between square brackets.

TABLE 6

Cross Sectional Regression Analysis. Quadratic Model. Window [-5;+5]

	Market model		Alfa = 0 Market model		Zero-One Market model	
	(a)	(b)	(a)	(b)	(a)	(b)
$PREMIUM_i$	0.2835	0.2339	0.3138	0.2726	0.3404	0.3011
	(1.07)	(0.9)	(1.47)	(1.07)	(1.24)	(1.11)
	[0.78]	[0.64]	[0.88]	[0.76]	[0.90]	[0.79]
$PREMIUM^2_i$	-0.0999	-0.0816	-0.1104	-0.0952	-0.1173	-0.1027
	(-1.11)	(-0.93)	(-1.58)	(-1.1)	(-1.26)	(-1.11)
	[-0.80]	[-0.65]	[-0.91]	[-0.78]	[-0.90]	[-0.79]
$RELSIZE_i$	0.0336	0.4855***	0.0268	0.4021**	0.0510	0.4093**
	(0.47)	(2.68)	(0.34)	(2.26)	(0.69)	(2.15)
	[0.05]	[0.73]	[0.041]	[0.62]	[0.07]	[0.59]
$RELSIZE^2_i$		-0.9332***		-0.7749**		-0.7399**
		(-2.7)		(-2.28)		(-2.04)
		[-0.71]		[-0.60]		[-0.54]
$RELROA_i$	0.0000	-0.0002	-0.0002	-0.0004	0.0001	-0.0001
	(-0.04)	(-0.21)	(-0.18)	(-0.39)	(0.07)	(-0.06)
	[-0.00]	[-0.01]	[-0.02]	[-0.03]	[0.00]	[-0.00]
$CASH_i$	0.0526**	0.0472*	0.0536*	0.0492**	0.0711***	0.0669**
	(2.06)	(1.9)	(1.86)	(2.01)	(2.7)	(2.57)
	[0.23]	[0.20]	[0.24]	[0.22]	[0.30]	[0.28]
$DOMESTIC_i$	0.0059	-0.0001	0.0031	-0.0020	0.0065	0.0017
	(0.26)	(-0.01)	(0.14)	(-0.09)	(0.27)	(0.07)
	[0.02]	[-0.00]	[0.01]	[-0.00]	[0.03]	[0.00]
$FRIENDLY_i$	-0.0061	-0.0106	-0.0052	-0.0088	-0.0101	-0.0136
	(-0.26)	(-0.46)	(-0.25)	(-0.39)	(-0.41)	(-0.56)
	[-0.03]	[-0.05]	[-0.02]	[-0.04]	[-0.04]	[-0.06]
$DIVER_i$	0.0044	0.0069	0.0058	0.0079	0.0113	0.0133
	(0.21)	(0.34)	(0.26)	(0.4)	(0.53)	(0.63)
	[0.02]	[0.03]	[0.03]	[0.041]	[0.05]	[0.06]
$MULTIBIDDER_i$	-0.0209	-0.0267	-0.0240	-0.0288	-0.0365	-0.0411
	(-0.73)	(-0.96)	(-0.9)	(-1.05)	(-1.23)	(-1.4)
	[-0.07]	[-0.09]	[-0.08]	[-0.10]	[-0.12]	[-0.13]
$REGULATED_i$	0.0120	0.0090	0.0056	0.0031	-0.0006	-0.0029
	(0.33)	(0.25)	(0.18)	(0.09)	(-0.01)	(-0.08)
	[0.04]	[0.03]	[0.02]	[0.01]	[-0.00]	[-0.01]
CONSTANT	-0.1924	-0.1703	-0.2144	-0.1961	-0.2614	-0.2439
	(-0.91)	(-0.82)	(-1.24)	(-0.97)	(-1.19)	(-1.13)
B-P	2.59	1.25	2.79	1.55	2.07	1.16
F	1.03	1.25	1.06	1.20	1.07	1.18
R^2	0.26	0.31	0.27	0.22	0.27	0.30

B-P is the Breusch-Pagan test, and it is distributed as a chi-square with one degree of freedom. F is F-Statistic. ***Significance at the 0.01 level, **significance at the 0.05 level, *significance at the 0.1 level. t- statistics between brackets. Standardised coefficients between square brackets.