

Evaluation of merger premium and firm performance in Europe

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Abstract

This paper investigates whether the deal premium affects the performance of the acquiring firms in European mergers and acquisitions (M&As) deals for the period 2000-2013. We find a significant reduction in short-term performance of the acquiring firms after the M&As, reflecting the overpayment hypothesis. Our result also indicates that the negative effect on the performance of the acquiring firms is less pronounced in the long-term. The result confirms the synergy hypothesis and the existence of quadratic relationship between high premium and performance. Our findings are robust as we control for firm and time trends. The findings of our study have implications for companies engaging in acquisitions in Europe.

Keywords: mergers; premiums; performance; acquisition; Europe, returns

1. Introduction

The 2010s produced the greatest wave of mergers in global history. According to the Dealogic (2016) financial data, global mergers and acquisitions (M&As) have grown substantially in size, frequency, and strategic importance from below \$20 billion in 1967 to about \$5.05 trillion in 2015. Several reasons highlight the motives behind M&A deals. These include growth opportunities (Harrison, Hitt and Ireland, 2001), gaining value in response to regime shifts in an industry (Mitchell and Mulherin, 1986), managerial hubris (Roll, 1986), defensive tactic (Gorton, Kahl and Rosen, 2009), a means to take advantage of market misvaluation (Shleifer and Vishny, 2003), bankruptcy avoidance, increase diversification, and synergy (Halpern, 1983; Haleblan et al., 2009). Bower (2001) puts forth five reasons for acquisition decisions as:

(1) reducing overcapacity in mature industries, (2) achieving economies of scale and scope through geographic roll-ups, (3) expanding new products or market power, (4) standing-in for research and development, and (5) inventing an industry by culling resources from industries whose boundaries are disappearing.

Whatever the motives behind the managers' actions, there is no consensus about the post-acquisition performance of the merging firms as there are different contrasting results. Some studies provide evidence of significant negative returns for the acquiring firms (e.g., Kennedy and Limmick, 1996; Rau and Vermaelen, 1998; Fuller et al., 2002 and Moeller et al., 2005), as well as negative long run post-acquisition performance (Agrawal and Jaffe, 2000). Other studies (e.g., Franks et al., 1991) do not find significant underperformance post-acquisition. Antoniou et al. (2008) for example, examine the impact of premiums on the post-acquisition performance but find no evidence that high premium paying companies underperformed low premium paying ones in the three-years following the deal. Another strand of the M&As literature shows the positive abnormal returns on these deals post-acquisition (e.g., Humphery-Jenner and Powell, 2011), and Mulherin and Boone (2000) report a positive synergistic wealth effects after the acquisition. Similarly, Savor and Lu (2009) provide evidence that companies who successfully consummate a deal perform better than those who fail to do so.

Extant literature suggests that merger premiums are often overpaid (e.g., Schwert, 1996; Agrawal and Jaffe, 2000; Dong et al, 2006; Eckbo, 2009). For the target firms, the overwhelming evidence suggests that, on average, they earn positive abnormal returns in post M&A deals (Datta, et al., 1992; Hansen and Lott, 1996; Chari et al., 2012, Goddard et al., 2012). This is largely attributable to the premiums received as part of the merger transaction. However, for the acquiring firms, the evidence is rooted within the contrasting literature of negative abnormal returns, non-significant underperformance and positive abnormal returns (see for example, Moeller et al., 2004; Antoniou et al., 2008; Savor and Lu, 2009). Given these trade-offs, the benefits of M&A are not obvious. As a result, the association between premium and performance is largely an empirical matter. To provide evidence, the present study examines the relation between premiums paid and the short-term post-merger performances of acquiring firms in the EU.

We also analyse the effect of the takeover on the long-term post-merger performances of acquiring firms in the EU. Majority of the studies that examine merger premium and firm value focus mainly on the US and UK based firms. Given the global relevance of the EU and the

growing M&A deals in the region, there is need for more diverse study as research is scanty in this regard (see Papadakis, and Thanos, 2010). Consequently, the study of the impact of the EU M&A deals will offer rich insights on the effect of M&A on post-acquisition performance of the acquiring firms.

Our study is underpinned by two hypotheses, namely the overpayment and the synergy hypotheses. The first hypothesis posits that high premium paid during acquisitions is responsible for the subsequent underperformance of firms (e.g., Sung, 1993; Schwert, 2003). The theory hinges on the fact that high premiums could force managers to create impossible targets to justify the price paid for the target. If the expected targets are not met, then the takeover consequently destroys value. Jensen and Meckling (1976) argue that managers overpay for the target firms for their personal benefits; and Roll (1986) conjectures that managers' motivated by hubris tend to overpay for targets. The second hypothesis posits that the premium paid is a signal of the synergies expected (e.g., Harrison et al., 1991; Palia, 1993; Fu et al., 2013). The hypothesis argues that managers will pay higher premium for higher synergy values.

This paper contributes to extant literature by providing a comprehensive evidence of the effects of M&A deals on short- and long-term performance of firms in the EU. In doing so, we control for deals, firm and country level characteristics that could influence the size of the premium offered in a deal. Our study differs substantially from existing studies. For example, Antoniou et al (2008) examine the difference in the performance of large versus low premium UK firms between 1984-2004 while our study focuses on large EU mergers and uses the Carhart four-factor model to capture the momentum factor which is the earning premium of the acquirers. The momentum factor enables us to estimate the Alpha of the post deal completions for up to 60 months. We provide empirical evidence with more recent data of 2000-2013 on the impact of premium on short and long term performance by evaluating the existence of quadratic relationship between high premium and performance. Finally, our study also estimates the point of inflection between which the synergy hypothesis becomes effective.

Our results show a significant negative influence of the premium on the abnormal returns, supporting overpayment hypothesis (Grullon et al., 1997). The result suggests that the acquiring firms are paying higher premium on targets firms, higher than market participants' expectation, suggesting that the acquisitions are value destroying. Our findings also show that

the quadratic relation predict that the market expects a value creating acquisition will command a higher premium, around two times the average premium - reflecting a synergy effect.

Further, our empirical results suggest that, indeed, the long-term performance of the acquisition is negative to the acquirers. Our results adds to the growing literature on long-term post-acquisition underperformance of the bidder (e.g., Agrawal et al., 1992; Limmack, 1991; Loughran and Vijh, 1997; Rau and Vermaelen, 1998) by showing that the long-term takeover effect of EU firms are not value adding. In this regard, we contribute to the broader literature on the long-term performance of mergers (e.g., Rau and Vermaelen, 1998).

The rest of the paper is organised as follows: Section 2 is literature review and the development of the research hypotheses; Section 3 is the description of data and research models. Section 4 discusses the empirical tests and results of the study, and Sections 5 is conclusion.

2. Literature review and hypotheses development

The popularity of the performance of corporate acquisitions is increasing especially since the 1980s. As a result, the economic value of the acquisition for the acquiring firm has been the subject of interest to a significant number of practitioners and academia from different fields (Roll, 1986; Varian, 1988; Sudarsanam and Mahate, 2003; Zollo and Meier, 2008; Cho et al., 2016). Due to the complexity of the M&As process (Larsson and Finkelstein, 1999), there is no agreement on the approach to be used on measuring the acquisition success; whether by the long-term event or the short-horizon event windows (Javidan et al., 2004). Zollo and Meier (2008) review 88 articles of the M&A literature published between 1970 and 2006 and find that 41% of the papers use the short-term approach while 28% adopt the long-term methodological approach. According to MacKinlay (1997), short-term event studies reduce the effect of confounding events and are robust to different model specifications while Healy et al. (1992) document that they correlate with long-term performance measures. On the other hand, Zollo and Meier (2008) find no significant relation between the short-term event and other approaches. Clearly, the conflicting findings motivate us to use both the short-term and the long-term approach to analyse the effect of acquisition premiums on performance.

2.1 Hypothesis development

Several researchers have attempted to document the evidence of the gains of M&As for the acquiring firms. For example, Nathan and O'Keefe (1989) provide empirical evidence that

premiums increase with time, and show a negative relationship with the business cycle, measured by the S&P index. Schwert (1996) in his study of 1,814 deals of US firms finds a correlation between the level of run-up in the target firm's share price pre-bid announcement and the level of the premium paid. In a more recent study, Madura et al. (2012) find evidence of a positive relationship between industry and macroeconomic factors and premiums paid. They show that the level of the premium is directly proportional to the level of growth of an industry, the capital liquidity present and the level of volatility.

The perception of managers of the level of synergy benefits from takeovers, whether in the short and long-terms, will determine the level of premium paid. Too large premiums raise the stakes for what level of synergy needs to be achieved in order to make the deal a value creating one. This follows from the synergy hypothesis. It therefore means that if companies overpay, the markets are likely to punish them more severely in negative abnormal returns compared to their peers. Damodaran (2005) points out that in order to arrive at the price to pay for a target, the level of synergies should be the difference between the value of the combined firm and the sum of the standalone values of both firms discounted at the appropriate rate that highlights the risk of those synergy cash flows. If the present value of the synergies is less than the premium paid, then the deal has destroyed value and the market will eventually identify this value loss and correct itself.

Other factors advanced as determining the level of the premium paid include deal characteristics such as deal value (Moeller et al, 2004), toehold (percentage of shares held in the target by the acquirer at announcement (Eckbo, 2009)), level of target hostility (Schwert, 2000), and method of payment (Myers and Majluf, 1984). However, others are of the contrary view of the benefits of M&A (see Zollo and Meier, 2008). We conclude that since the impact is not obvious, the effects are subject to empirical validation. Thus, our first hypothesis considers whether the amount of premium paid has any significant effect on the short run performance of a firm. Based on the above discussion, we hypothesize in the alternate form:

Hypothesis 1: *Premium paid has significant effect on short run performance.*

Next, we analyse the data to determine whether quadratic relationship exist between the premium paid and acquirers' returns. We consider this association because as expected, if the premium is too high, we should expect a positive effect, as indicated in the synergy and

overpayment hypotheses that identify a relationship in the opposite direction. According to the synergy hypothesis, a higher deal premium could be a sign of great expectation from the merger and the possibilities of obtaining synergies (Slusky and Caves, 1991). For example, Danone, the French dairy company that wants to acquire a North America's firm, White Wave Foods for \$12.5bn, pays about 40 times the target company expected earnings in 2017 (Barber, 2016). Therefore, our second hypothesis seeks to explore the relationship between premium paid and returns, and states as:

Hypothesis 2: *There is a significant quadratic relationship or synergy between the premium paid and acquirers' returns?*

Despite the intention of mergers to generate both short and long-term economic values for shareholders (Ramaswamy and Waagelein 2003), the question, whether it can be sustained past the short-term prospects, remains elusive. Because managers undertake mergers with multiple motives in mind (Schweizer, 2005), they see the price paid as the true assessment of the target's net worth and thus the short-term event studies may not reflect the full impact of the mergers (Zollo and Meier, 2008). Therefore, we examine the M&A long-term overall acquisition performance. Harrison et al. (2005) show that using the short-term event window for M&A performance evaluation could lead to wrong findings since they are not related to the economic value from the mergers.

Most studies on M&As have argued that acquiring firms suffer long-term abnormal underperformance (Doukas and Travlos, 1988; Agrawal and Jaffe, 2000). For example, Datta and Puia (1995) document significant negative abnormal returns on the US acquiring firms. On the contrary, other studies critique the view of long-term underperformance of takeovers, and argue that it is inconsistent with the efficient markets hypothesis (Dutta and Jog, 2009), and the extent of the impact on stock price depends on the estimation techniques used to measure the return (Martynovaa and Renneboogb, 2008). A growing number of other empirical studies report long-term economic values for shareholders following takeovers (e.g., Ben-Amar and Andre, 2006; Martynova and Renneboog, 2008; Eckbo and Thorburn, 2009). For instance, Langetieg (1978) documents that post-acquisition performance of the acquiring firm is not significantly different from the control sample. Similarly, Bradley and Jarrell (1988) and Franks et al. (1991) do not find significant post-acquisition underperformance of the acquiring firm while Rahman and Limmack (2004) find positive change in long-term operating performance of acquirers of

Malaysian firms. Also, Kumar and Bansal (2008) focus on India acquiring firms and find a significant improvement in post-merger profitability. Though Nnadi and Tanna, (2014) have established that cross border acquisitions create significant loss in shareholder value for the acquiring banks, and that profitability in the case of domestic mergers is driven by the level of risks, the long-term effects of M&As are not a priori obvious. The impact can differ across countries and time. To provide evidence, we examine the long-term effects of post-acquisition performance on the acquiring firms. Thus, we develop the following hypothesis in the alternate form:

Hypothesis 3: *M&A has significant effect on long-term performance of acquiring firm.*

3 Data and methodology

3.1 Sample and data collection

The data on mergers and acquisitions deals on EU firms is obtained from the SDC Platinum of Thomson Financial Securities Data Worldwide Mergers and Acquisitions Database. In obtaining the data, we apply the following criteria:

- *Time period:* From 2000 to 2013. This period was chosen to cover the gap in existing literature on this topic, it includes the period of the most recent financial crisis, and ensures we have up to three years post-acquisition performance information as at the research date.
- *Markets:* The focus of this research is the European market. We have restricted the sample to deals involving acquirers and acquisition targets domiciled in this region.
- *Public status:* To ensure we obtain company specific information on both acquirer and target, the sample is restricted to public companies in which the offer price is not missing. We also restricted the sample to those transactions in which the acquirer crossed the 50% shareholding threshold in consummating the transaction.
- *Deals and deal size:* We only include completed deals. To reduce the impact of noise in the sample, we restrict the deals obtained to those with value exceeding \$5 million threshold.
- *Exclusions:* Following Fama and French (1992), we exclude financial firms and utilities due to the impact of regulation and other peculiarities within these industries. We also exclude cross-border takeovers except if it is within the EU, and deals classified by

Thomson Financial as rumours, repurchases, recapitalizations, or target solicitations. Further, we exclude sample if the bidding and target firms do not have accounting data available for at least one year prior to takeover.

Our stock return and accounting data was collected from DataStream database. Our final sample consists of 725 mergers and acquisitions transactions from 19 European countries over the period 2000–2013 was obtained applying these standard selection criteria.

3.2 Methodology

For our short-term analysis of the effect of premium on firm performance post-acquisition, we adopt the notion that stock prices reflect the amount of private information impounded into it through informed trading by arbitrageurs. As stock market participants obtain new and valuable information about the acquisition and appraise the firm’s performance around the occurrence of the merger, it will reflect on the stock returns for the acquiring firm (e.g., see Gubbi et al., 2010; Morck et al., 2000), and this can be used to determine the abnormal return around the announcement day. Thus, we employ the event study method because it reflects stock market responses to the unexpected announced event (McWilliams and Siegel, 1997).

In order to analyse the responses of the market participants to the announcements, we compute the cumulative abnormal returns (CAR) over an event window following Brown and Warner (1985), defined as:

$$CAR_{it} = \sum_{t=1}^{\tau} AR_{it} \dots \dots \dots (1)$$

where $AR_{it} = R_{it} - \hat{R}_{it}$

R_{it} is the actual return of the sample firm R_i at time t and \hat{R}_{it} is the expected return for that firm in time, t . Fama (1998) highlights that given the assumption of efficient markets, the abnormal returns for firms should be zero. The efficient markets hypothesis also assumes that prices adjust rapidly to any change in information. Hence, in response to a merger or acquisition announcement, we expect the prices of the securities to adjust rapidly to the new information.

To measure the short-term market reactions to the proposed deal, we use the three-day and five-day event windows and the market model to estimate the CARs. The abnormal returns are

computed for each company over the event window. The Alpha (α) and Beta (β) for each acquiring company is obtained by regressing the returns of the company on the returns of the market over the event window t-360 to t-60 (calendar days). In order to sidestep the possibility of carrying over past abnormal results into the event window, estimated returns are obtained by multiplying the derived beta by the market return. To test our first hypothesis, we run the following regression model for the three-day and five-day event window:

$$\begin{aligned}
 CAR = & \alpha + \emptyset + \beta_1 Premium + \beta_2 Acq\ Ttl\ Assets + \beta_3 TransValue + \beta_4 Tgt\ Market\ to\ Book + \\
 & \beta_5 Tgt\ ROA + \beta_6 Acq\ Tobin\ Q + \beta_7 Acq\ Stock\ Rtn + \beta_8 LnGDP + \beta_9 Acq\ Market\ to\ Book + \\
 & \beta_{10} Acq\ Rtn\ Volatility + \beta_{11} Tgt\ Ttl\ Assets + \beta_{12} HighLowpremium\ Dummy + \\
 & \beta_t YearDummies + \varepsilon
 \end{aligned}
 \tag{2}$$

In the model, CAR is our abnormal returns from equation (1), α is the intercept and \emptyset is fixed firm effects. Following Ahern et al. (2015), we compute premium as the transaction value reported by SDC divided by the market value of the target four weeks before the announcement date. Following existing research, we include several controls variables designed to mitigate potentially confounding factors known to affect the acquisition performance. We control for firm size of target (Asquith et al., 1983), acquirer firm size, (Morck et al., 1990), tender offers (Rau and Vermaelen, 1998), market to book ratio for acquirer and target firm (Laamanen, 2007). We control for transaction value, past year stock return and return volatility, and country's size using natural logarithm of GDP (Ahern et al., 2015). We control for high premium transactions via dummy variable that equals 1 if the premium is higher than the median premium of the target return on assets, or 0 if otherwise (Kisgen et al., 2009). The variables are fully defined in Appendix 1.

Diaz, Azofra and Guiterrez (2009) explore banking takeovers in Europe and found a quadratic relationship between deals premiums and bidder returns. Their findings indicate that up to a threshold of 21%, the premium has a positive impact on the returns and with premium proxying for anticipated synergies, a finding consistent with Antoniou et al (2008). It is the goal of this paper to shed light on the impact, if any, of premiums paid on subsequent performance, using this quadratic approach. The existing literature on the link between premiums and subsequent performance remains relatively scanty compared to for example, the determinants of the takeover premium. This research seeks to provide a robust look into the nature of the relationship between deal premiums and post-acquisition performance in the EU. We include

premium squared in the model (Eq. 3) to ascertain if a quadratic relationship exists between premium and returns.

Therefore, in our second hypothesis, to explore the existence of the nonlinearity relationship between the deal premium and performance, we follow Diaz et al. (2009) model and use the quadratic regression approach:

$$CAR = \alpha + \phi + \beta_1 Premium + \beta_2 Premium^2 + \sum \beta_n X_n + \varepsilon \quad (3)$$

where the maximum of the premium is estimated as:

$$\frac{\delta returns}{\delta Premium} = \beta_1 + 2\beta_2 Premium = 0 \quad (4)$$

$$Premium = \frac{\beta_1}{2*\beta_2} \quad (5)$$

Where: the dependent variable for (3), **CAR**, represents the cumulative abnormal return of the acquiring company for the [-1;+1] and [-2;+2] and our main independent variable, *Premium*, is as defined in equation (2). X_n is the vector of control variables in equation (2). **Premium²** is a variable that captures the quadratic relationship between both variables and the dependent variable as defined in equation (2), often referred to as inverted “U-shapes” functional form in literature. From equation (5), we expect the relationship between the bidder’s return and deal premium (that is, the point of inflection) to be convex, that is $\beta_1 < 0$ and $\beta_2 > 0$.

Next, we evaluate the post-merger performance using the calendar-time portfolio approach. This approach overcomes some of the problems associated with event study methods (Mitchell and Stafford, 2000) and a widely accepted approach for measuring the abnormal performance of firms (e.g., Comer et al., 2009; Morse et al, 2011). It has been well documented that stock prices ‘fully incorporate’ all available information (e.g., Bai et al., 2016), which include for the bidding firms, the deal premium. Thus, we use the Carhart (1997) four-factor model, an extension of Fama and French (1993) three-factor model to estimate the abnormal returns for the long-term net performance of the mergers because it explains a major portion of the variation in equity returns (for example, Artman et al., 2012). Hence, for every observation, we obtain the returns, R_{it} , from DataStream database which are then used in the 4-factor equation (3) below to estimate the abnormal return.

$$R_{it} - R_{ft} = \alpha_i + \beta_i(R_{mt} - R_{ft}) + s_iSMB_t + h_iHML_t + h_iWML_t + \epsilon_{it} \quad (6)$$

Here, for each day t , $R_{it} - R_{ft}$ is the excess return of the test stock, $R_{mt} - R_{ft}$ is the market portfolio excess return, SMB_t is the size premium return factor, HML_t is the value premium return factor, WML equals the earning premium (momentum factor) as calculated by French (2016), α_i is the intercept of the model which represents the abnormal performance earned by manager, and ϵ_{it} is the stochastic error term.

4. Empirical tests and results

In this section, we present empirical evidence on the effects of the deal premium on the bidding firms' performance.

4.1 Descriptive statistics

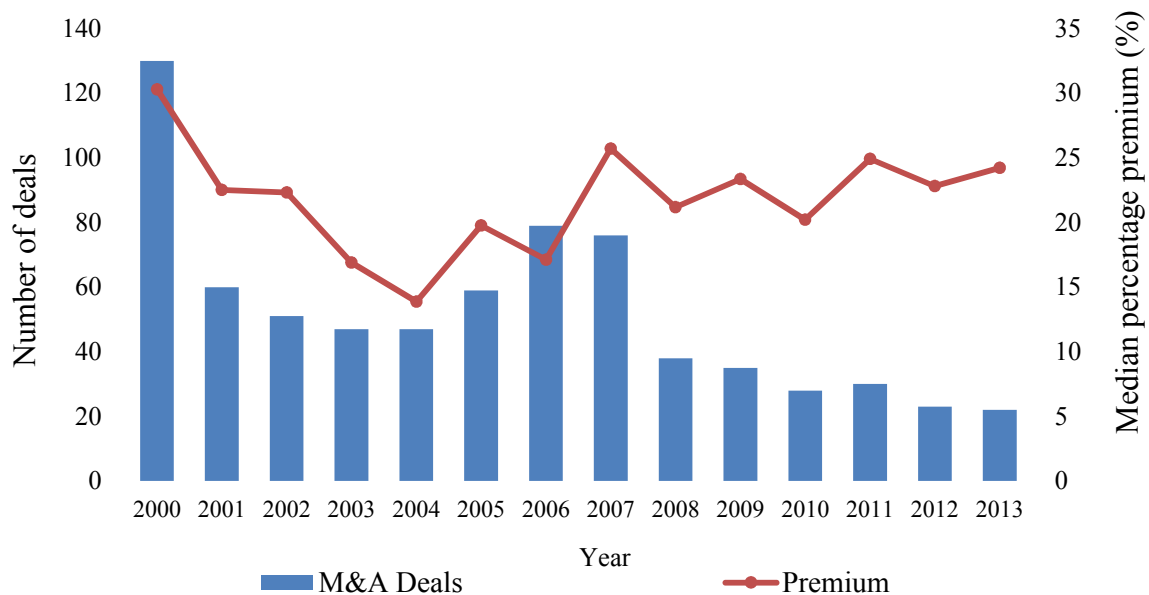
Table 1 presents descriptive statistics of our final sample by countries (Panel A) and across time (Panel B). The United Kingdom remains the country with the highest number of acquirers over the sample period with 230 reported acquisitions. The UK and France are the highest-volume acquirer countries (50% of deals) while Hungary, Lithuania and Luxembourg are the least-volume acquirer countries (less than 1%). France and the UK also reported a combined transaction value of \$327m (around 47%) over the sample period. Table 1 also shows that there is no major difference in the mode of payment, and around 46% of the transactions are financed by using cash only. The literature suggests that more stock are used during periods of high market valuation, otherwise cash is used. As column (4) indicates, the deal premium for mergers in Lithuania and Luxembourg are 100% higher than the sample median while in Netherlands, it is 69% higher than the sample premium. Hungary, Portugal, and Greece recorded the lowest deal premium paid below the sample mean in our sample period.

Panel B of Table 1 summaries the transactions in Europe by year. The table shows that acquisitions in Europe follow the same wave patterns of M&A activity globally (Alexandridis et al, 2012). M&A activities declined in 2001 due to the Dot-com crash of summer 2000, but gradually build-up and reached a record high in 2006 (see Alexandridis et al., 2012). The financial crisis of 2007 also led to progressive decline in the number of M&A transactions in the intervening years.

[Insert Table 1 here]

Figure 1 indicates the relationship between percentage of premium and the number of M&A deals. Between year 2000 and 2006, it indicates that as number of deals rises, the premiums tend to rise and vice versa. The year 2000 has the highest number of deals in the figure which corresponds to the highest median premium observed in our sample. High median premiums are identified in the years of high market valuation and bubbles - 2000 and 2007. It appears that although the financial crisis started to affect merger activities in late 2007, the impact was felt the following year as the median premiums declined in 2008 to 21% and fluctuates between 20% and 25% in year 2009 to 2013. Such evidence supports the merger wave hypothesis of acquisition activity and justifies the inclusion of year dummies in the regression models investigating the relationship between premiums and post-acquisition performance.

Figure 1. M&A Deal activities and Percentage Premium



4.2 The effects of premiums and post-merger performance using the short-term event window

In this section, we examine the association of the impact of deals premium on the bidding firm performance after the merger. Using the market model, the 3- and 5- day CARs are analysed. Table 2 presents our primary results of the regression analyses.

From the results in column (1), the 3-Day cumulative abnormal returns (CAR) without the fixed year effects is negative ($\beta_1 = -0.184$) and statistically significant at the 10% level, and in column (2), the results with the fixed year and firm effects is negative ($\beta_1 = -0.185$) and statistically significant at the 10% level. The results indicate that the premium paid has significant negative effect on the abnormal returns. In columns (3) and (4), using the 5-Day CARs as dependent variables, the results are not statistically significant. The results show that, on average, takeover of listed firms in the EU generates negative response from investors by producing negative abnormal returns to the bidding firms' shareholders. As shown from columns (1) to (4), the 5-Day [-2;+2] event is not significant but the 3-Day event window [-1;+1] is negative and statistically significant, suggesting that the arrival of new information allow investors to glean previously unavailable information, improving their investment decisions and informational efficiency of the capital markets. In addition, we find that high premium paying acquirers have a positive but insignificant CARs in the short window. In sum, the findings of the 3-Day regression results support hypothesis H1, which predict a negative association between premium paid and the bidding firm performance.

[Insert Table 2 here]

4.3 Do mergers driven by higher premium generate synergies for the bidders?

As discussed above, evidence suggests that the high premium paid by the acquirer generates negative response from shareholders and proxy for overpayment in takeovers, because as Dutordoir et al. (2014) argued, investors perceive that managers lack precise information to obtain accurate analysis of target synergy benefits. However, this association could be subject to size of the premium (see for example, Fu et al., 2013; Palia, 1993; Ruback, 1982). As the premium increases, investors could consider higher premium as evidence of higher synergy. Therefore, to test hypothesis H2, we analyse whether the magnitude of premium paid could influence the acquiring company's abnormal returns using a quadratic relationship.

Table 3 shows the results obtained from our regression analysis examining any quadratic relationship between the premium paid and acquirers' abnormal returns in the short run. It is observed in column (1) that the coefficient for Premium is negative and statistically significant at the 5% level and the coefficient of *Premium*² shows a significant positive association with abnormal returns at the 10% level. The findings confirm the existence of quadratic relation, but

subject to the size of the premium. The coefficient of Premium is negative, supporting the overpayment hypothesis and suggesting that market participants consider acquisition as a value-destroying deal (Diaz et al., 2009; Mueller and Sirower, 2003). On the contrary, when the deal premium is very high, it has an insignificant but positive effect on the acquiring firm in line with the synergy hypothesis. The findings show that investors expect firms to be willing to pay above-average premiums for firms with relatively higher investment opportunities or for a special company that will help the acquiring company to get ahead of competitors such as through the realization of production and distribution economies. Ruback (1982) argues that a target firm that creates value should have several bidding firms competing for takeover and thus the acquiring firm will need to pay excessive high premium.

Next, analysing the quadratic relationship using the coefficients from Table 3 in column (1) and (2) on equation 5, the point of inflection should be between 3.01 (i.e., $-0.428/(2*0.071)$) and 3.18 (i.e., $-0.414/(2*0.065)$). Given that β_2 is positive in our estimates, these points represent the minimum. Taken at face value, these findings strongly suggest that investors will consider acquisition a value creating investment opportunity with substantial degree of synergies if the bidding firm pays above 2.01 to 2.18 times the average deal premium respectively, thus reflecting the effect of synergy hypothesis.

[Insert Table 3 here]

In columns (3) and (4) of Table 3, using the 5-Day abnormal return shows the regression results are not statistically significant. This suggests that lower information quality could affect stock prices leading to misvaluation of investments. In summary, using stock abnormal returns as proxy for post-acquisition value creation, the 3-Day regression results support our hypothesis H2 that there is a significant positive quadratic relationship between the premium paid and firm performance for the acquiring firm, suggesting synergy hypothesis. Further, these finding of the 3-Day and 5-Day also supports the notion of stock price informativeness, that the stock price reflects the amount of firm-specific information impounded into it.

4.4 The effects of merger on the long-term performance of acquiring firm using the Calendar-time portfolio approach

In this section, we analyse the effect of takeovers on the bidder's long-term performance using the Calendar-time portfolio approach used in prior studies (e.g., Dutta and Jog, 2009). To

compute long run returns, we use the Carhart (1997) four-factor model to estimate the Alpha over the post deal completion. The CARs of each firm are regressed against the market premium, size and book to market factors over the respective months.

[Insert Table 4 here]

Table 4 reports the results of the calendar-time four-factor regression model. For the 12 months period, we observe a negative Alpha for the 2000-2013 period. The Alpha for the 12 months is negative and statistically significant =0.35% per month, with a t-statistic of 5.95, though the abnormal returns are significantly below zero. Similarly, the intercept for the regression using the 24 months returns is negative and statistically significant ($\beta=-0.0014$, or -0.14%). Therefore, our result shows underperformance of EU acquiring firms although the evidence from this analysis are barely below zero. The results are similar using the 36 months and 60 months returns. Therefore, our results show the long-term underperformance for EU acquiring firm and strengthens the inference from our findings that the EU acquiring firms are likely to result in long-term underperformance.

This finding is consistent with our short-term analysis. The coefficients of the SMB and HML factors are negative and are statistically significantly for most of the period. A negative coefficient of SMB implies that the average size of bidding firms is quite large while negative coefficient of HML suggests that the sample firms are high growth firms with higher price-to-book ratio and the positive coefficient of WML signifies that the sample firms past returns are marginally higher. The overall model fit is considerably lower (the largest adjusted $R^2 = 0.09$). Collectively, by using both the short and long-term event window, we find strong support for the acquiring firm underperformance post-acquisition.

5 Conclusion

This study test three hypotheses which include whether premium paid has significant effect on the short run performance of the acquirers; examining if there is a significant quadratic

relationship or synergy between the premium paid and the acquirers returns, and finally whether M&As have significant effect on the long run performance of acquiring firms. The result of the first hypothesis shows that premium has a negative effect on the abnormal returns of acquirers. In our second hypothesis, the coefficient of premium is negative which supports the overpayment hypothesis and suggests that the market considers such acquisitions as value destroying. However, the premium² has a positive and significant relationship with the CARs indicating existence of a quadratic relationship which also supports the synergy hypothesis. The result from our last hypothesis confirms that in the long run, European firms underperform following mergers and acquisition.

Our findings reveal that, in the short term, premiums have a negative quadratic relationship with abnormal returns and but a positive relationship in the long-term. Hence, in the short term, returns show a negative relationship with premium paid until a premium level of 2.01 times the average premium is reached. The overpayment hypothesis holds true until the 2.01 times the average premium mark is attained, after which the synergy hypothesis comes into play. Our result also confirms underperformance of acquirers after the merger.

These results are robust to several deal and firm specific characteristics. In this paper, we provides empirical evidence that as far as announcement period and long run post acquisition performance are concerned, premiums play a significant role in explaining the results obtained. The results do not necessarily imply causality but point to strong relationships between the variables. Low premium acquirers have an advantage as higher premiums paid creates a “hurdle” to cross; an extra motivation to actualise the synergies underpinning the premiums paid and this may invariably lead to their better performance.

The implication of these findings is that companies engaging in acquisitions need not worry about paying significant premiums if they can be certain of generating the synergies to justify the level of premium paid. In the same way as debt levels act as a hurdle to spur managers to deliver sufficient profits to meet interest and principal repayments, high premiums seem to act as a prod to managers of the acquiring company to deliver value in excess of the premium paid. Companies focusing on short run returns can offer significant premiums to excite the market about the synergies they think they can glean from the mergers. They would do well to remember that in the years following the acquisition, any failure to deliver on those forecasted synergies would be punished by the market though the operational cost efficiency and capital strength of acquirers are significant in influencing excess returns (Nnadi and Tanna, 2013).

On the other hand, low premium acquirers while suffering only modest losses relative to peers in the announcement period must find the “motivation” to deliver synergy values beyond what their high premium counterparts would have done. The results show that they underperform their high premium paying counterparts and our study shows that high premium paying acquirers have an extra incentive, due to the level of premium already given to the target, to get back that value in synergies. Low premium acquirers must therefore benchmark against their high premium counterparts and seek to deliver similar levels of synergies. Only then can they argue to have preserved value over the short and long terms.

Taken together, the results obtained in the study show the need for more research on the impact of premium on post mergers and acquisitions using real accounting information. It would be interesting to analyse the impact of deal premium overpayment on corporate governance in the long term.

Appendix

Variable definition

Variable	Definition
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Acq Market to Book	This is the ratio of acquirer market-to-book value of equity the 12 months prior to the announcement month (Source: DataStream).
Acq Tobin Q	Acquirer Tobin' q is measured as the market value (MV) of equity less the book value (BV) of equity, plus the book value of assets, all scaled by the book value of assets 12 months prior to the announcement month (Source: DataStream).
Acq Ttl Assets	The natural logarithm of total assets of acquirer (Source: DataStream).
CAR	This is a 3-day or 5-day abnormal market returns around earnings announcement date estimated by using the market model (Source: DataStream).
HighLowpremium Dummy	Dummy variable equal to one if premium is higher than the median premium and zero otherwise
Acq Rtn Volatility	Acquirer Stock return volatility in the 12 months prior to the announcement (Source: DataStream).
Premium ²	is a variable that captures the quadratic relationship between premium and CAR
Acq Stock Rtn	Acquirer Stock return in the 12 months prior to the announcement month (Source: DataStream).
LnGDP	Natural logarithm of annual Gross Domestic Product (Source: World Development Indicators).
Premium	Premium calculated as the transaction value reported by SDC divided by the market value of the target four weeks before the announcement date (Ahern et al., 2015).
Tgt Market to Book	This is the ratio of target firm market-to-book value of equity the 12 months prior to the announcement month (Source: DataStream).
Tgt ROA	Target firm net income before the extraordinary items scaled by total assets in the 12 months prior to the announcement month (Source: DataStream).
Tgt Ttl Assets	The natural logarithm total assets of target firm (Source: DataStream).
TransValue	The dollar value of all consideration paid in a merger (Source: SDC).
YearDummies	Assigned dummy variables for each year to control for time effects.

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Table 1 (Panel A): Summary statistics: Sorted by country

The sample consists of acquisitions taking place by European acquirers between 2000 and 2013. Premium is computed as the difference between the initial offer price and the target market price four weeks before the announcement date divided by the target market price four weeks before the announcement. Cash and Stock represent the number of deals with each

method. Hybrid means a combination of cash and stock. High premium is where the transaction value reported by SDC is higher than the market value of the target, four weeks before the announcement date.

Acquirer Country	No. of Deals	Average Premium (%)	High Premium	Form of payment			Transaction value (\$m)
				Cash	Stock	Hybrid	
Austria	9	20	4	7	2	0	6,529
Belgium	17	24	13	9	5	4	26,278
Finland	19	31	11	10	4	5	5,415
France	132	27	95	67	36	37	168,394
Germany	55	21	33	35	12	9	57,812
Greece	15	12	8	6	8	4	7,692
Hungary	1	10	1	1	0	0	242
Ireland	7	28	4	1	4	2	1,698
Italy	37	24	20	16	10	12	58,255
Lithuania	1	67	1	0	1	0	180
Luxembourg	1	50	1	1	0	1	447
Netherlands	29	40	22	19	5	4	30,045
Norway	31	22	20	16	8	9	19,454
Poland	11	17	6	4	3	6	2,292
Portugal	3	6	3	3	0	0	644
Spain	33	15	21	14	18	5	69,046
Sweden	58	58	49	31	19	18	24,699
Switzerland	36	28	24	24	9	4	60,230
United Kingdom	230	32	178	118	70	61	158,777
Total	725	30	514	382	214	181	698,129

Table 1 (Panel B): Summary statistics: Sorted by time period

The sample consists of acquisitions taking place by European acquirers between 2000 and 2013. Premium is computed as the difference between the initial offer price and the target market price four weeks before the announcement date divided by the target market price four weeks before the announcement. Cash and Stock represent the number of deals with each method. Hybrid means a

combination of cash and stock. High premium is where the transaction value reported by SDC is higher than the market value of the target, four weeks before the announcement date.

Acquirer Date	No. of Deals	Average Premium (%)	High Premium	Means of Payment			Transaction value (\$m)
				Cash	Stock	Hybrid	
2000	130	35	81	63	41	26	113,233
2001	60	23	30	28	14	18	38,480
2002	51	28	27	26	12	13	42,424
2003	47	55	21	16	18	13	35,167
2004	47	16	14	23	11	13	47,151
2005	59	22	27	23	24	12	75,702
2006	79	19	30	35	24	20	93,717
2007	76	31	41	37	16	23	105,981
2008	38	26	18	18	9	11	30,394
2009	35	33	18	14	17	4	7,941
2010	28	22	15	13	6	9	27,183
2011	30	28	17	14	7	9	21,101
2012	23	37	11	9	9	5	28,077
2013	22	31	13	11	6	5	31,579
Total	725	29	363	330	214	181	698,129

Table 2: The effect of deal premium on post-merger performance of bidding firms

This table reports deal premium on firm performance post-acquisition. The dependent variables are cumulative abnormal returns for 3-Day (columns (1) and (2)) and 5-Day (columns (3) and (4)) event window . All variables (except High/Low premium dummy variable) are truncated at the 1st and 99th

percentile. We include year and fixed effects to control for any fundamental differences in premium and controls across time. Estimated standard errors are robust to heteroskedasticity and clustered at the firm level. Statistical significance denoted as ***, **, and * for 1%, 5% and 10% respectively (using a two-sided test).

	1	2	3	4
	3-Day CAR	3-Day CAR	5-Day CAR	5-Day CAR
Premium	-0.184*	-0.185*	-0.102	-0.101
	[-1.77]	[-1.67]	[-0.80]	[-0.80]
Acq Market-to-Book	0.079	0.093	-0.147	-0.216
	[0.33]	[0.53]	[-0.68]	[-0.90]
Tgt Market-to-Book	-0.015	-0.050	0.006	0.003
	[-0.17]	[-0.58]	[0.05]	[0.03]
Ln(Acq Total Assets)	0.001	0.322*	-0.155	-0.161
	[0.01]	[1.76]	[-1.26]	[-0.83]
Ln(Tgt Total Assets)	-0.058	-0.069	-0.035	-0.034
	[-0.78]	[-1.08]	[-0.49]	[-0.50]
Ln(Transaction Value)	0.083	0.053	0.031	0.020
	[1.08]	[0.77]	[0.50]	[0.33]
Tgt ROA	-0.001	-0.002	-0.001	0.000
	[-0.31]	[-0.64]	[-0.18]	[0.05]
High/Low premium	0.053	0.058	0.145	0.137
	[0.49]	[0.52]	[0.98]	[0.93]
Ln(Acq Past year return)	0.03	-0.105	-0.121	-0.143
	[0.20]	[-0.68]	[-0.56]	[-0.58]
Ln(Acq Past year return volatility)	0.252	0.346	-0.329	-0.166
	[0.53]	[0.59]	[-0.54]	[-0.27]
Acq Tobin Q	-0.181	-0.244	-0.022	-0.098
	[-0.72]	[-1.01]	[-0.07]	[-0.35]
Ln(GDP)	-1.429	-2.556	-0.691	-1.172
	[-0.52]	[-0.89]	[-0.18]	[-0.32]
Constant	6.86	8.152	5.897	8.548
	[0.51]	[0.62]	[0.33]	[0.50]
Number of observations	707	707	707	707
Adj. R-squared (%)	1.1	16.5	3.4	12.7
Year fixed effects	No	Yes	No	Yes
Firm fixed effects	Yes	Yes	Yes	Yes

Table 3: Relationship between the premium paid and acquirers' returns

This table reports whether a quadratic relationship exists between the premium paid and acquirers' returns using deal premium on firm performance post-acquisition. The dependent variables are cumulative abnormal returns for 3-Day (columns (1) and (2)) and 5-Day (columns (3) and (4)) event window. All variables (except High/Low premium dummy variable) are truncated at the 1st and 99th percentile. We include year and fixed effects to control for any fundamental differences in premium and controls across time. Estimated standard errors are robust to heteroskedasticity and clustered at the firm level. Statistical significance denoted as ***, **, and * for 1%, 5% and 10% respectively (using a two-sided test).

	1	2	3	4
	3-Day CAR	3-Day CAR	5-Day CAR	5-Day CAR
Premium	-0.428** [-2.22]	-0.414** [-2.03]	0.162 [0.53]	0.204 [0.70]
Premium Square	0.071* [1.87]	0.065* [1.67]	-0.077 [-1.23]	-0.087 [-1.41]
Acq Market-to-Book	0.093 [0.39]	0.107 [0.6]	-0.162 [-0.74]	-0.234 [-0.98]
Tgt Market-to-Book	-0.037 [-0.4]	-0.068 [-0.76]	0.029 [0.23]	0.027 [0.22]
Ln(Acq Total Assets)	-0.001 [-0.01]	0.321* [1.76]	-0.152 [-1.23]	-0.159 [-0.83]
Ln(Tgt Total Assets)	-0.089 [-1.15]	-0.098 [-1.41]	-0.001 [-0.01]	0.005 [0.06]
Ln(Transaction Value)	0.12 [1.53]	0.087 [1.2]	-0.009 [-0.12]	-0.026 [-0.36]
Tgt ROA	-0.001 [-0.37]	-0.002 [-0.67]	-0.001 [-0.14]	0.000 [0.08]
High/Low premium	0.087 [0.78]	0.091 [0.78]	0.108 [0.70]	0.093 [0.60]
Ln(Acq Past year return)	0.03 [0.2]	-0.103 [-0.67]	-0.122 [-0.57]	-0.146 [-0.60]
Ln(Acq Past year return volatility)	0.261 [0.54]	0.343 [0.58]	-0.339 [-0.56]	-0.161 [-0.27]
Acq Tobin Q	-0.195 [-0.77]	-0.248 [-1.04]	-0.006 [-0.02]	-0.092 [-0.33]
Ln(GDP)	-1.125 [-0.41]	-2.211 [-0.77]	-1.02 [-0.26]	-1.634 [-0.44]
Constant	5.558 [0.41]	6.631 [0.50]	7.305 [0.40]	10.58 [0.60]
Number of observations	707	707	707	707
Adj. R-squared (%)	2.0	17.3	4.0	13.7
Year fixed effects	No	Yes	No	Yes
Firm fixed effects	Yes	Yes	Yes	Yes

Table 4: Calendar-time portfolio regression using the Carhart four-factor model

	Factor					Model Characteristics		
	Alpha	RMRF	SMB	HML	WML	Adj. R square	F-stat	Sig.
12 Months								
Beta	-0.0035	0.0001	-0.0002	-0.0002	0.0002			
t-Statistics	-5.95	5.78	-2.11	-3.44	7.03	0.0325	18.76	0.00
Sig.	0.000	0.000	0.035	0.001	0.000			
24 Months								
Beta	-0.0014	0.0001	-0.0004	-0.0001	0.0001			
t-Statistics	-3.24	4.62	-7.16	-1.68	4.01	0.0604	19.93	0.00
Sig.	0.001	0.000	0.000	0.092	0.000			
36 Months								
Beta	-0.0024	0.0001	-0.0003	0.0000	0.0001			
t-Statistics	-6.42	5.21	-5.27	-0.93	4.35	0.0742	14.19	0.00
Sig.	0.000	0.000	0.000	0.351	0.000			
60 Months								
Beta	-0.002	0.000	0.000	0.000	0.000			
t-Statistics	-5.74	1.02	-2.99	-1.81	0.34	0.0935	4.30	0.00
Sig.	0.000	0.306	0.003	0.071	0.731			

This table presents the regression results for the Carhart four-factor model following the acquisition. RMRF is the difference between monthly stock return portfolio and risk-free rate. SMB, HML and WML are from the Kenneth French website, available at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html