

European mega deals during the sixth merger wave. Is the legal origin of the bidder and the target a determinant of short-term investor reaction?

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ABSTRACT

In the context of the mega merger and acquisition announcements during the sixth merger wave in Continental Europe, this paper presents an analysis of the influence of the bidder and target legal origins in the short-term reactions of the cumulative abnormal returns, the cumulative absolute abnormal returns and the volume traded. 92 bids occurred between 2003 and 2007 have studied. Our main result is a short term negative abnormal return for the bidder stockholders' firms as a consequence of the announcement, which can be mainly associated to the presence of companies whose legal origin is German. This reaction is also accompanied with a significant effect above the average level in the market volatility and the volume traded. Finally, there does not seem to be any significant different reaction depending on whether operations happen between companies from the same legal origin or from a different one.

KEYWORDS

M&As, Mega deals, Continental Europe, announcement effects, legal origin.

1. Introduction

Merger activity comes in waves, and European merger and acquisitions (M&A) activity has been increasing in importance over time. The fifth merger wave (1993–2000) showed that the European and US M&A activity could be equiparated. This increase in European takeover activity during the fifth merger wave resulted in increased research on European characteristics of such corporate transactions, given that, until then, empirical research on M&A activity was mostly focused on the US market. European legal origin differences among countries, and consequently, their distinct governance systems is also a valuable field of research on European corporate events. The Internet Dot Com Bubble burst and the 9/11 terrorist attacks caused an economic recession, and the consequent end of the fifth wave. The takeover market did not recover until 2003, which is considered the beginning of the sixth merger wave. This new wave ended abruptly in late 2007 due to the Financial Crisis of 2007–2008.

While shareholders' short-term wealth effects of European bids during the fifth European merger wave have been studied by several authors (Campa and Hernando, 2004; Goergen and Renneboog, 2004; Campa and Hernando, 2006; Faccio et al., 2006, Martynova and Renneboog, 2006; Martynova and Renneboog, 2011), the sixth merger wave has gone largely unnoticed in academia. To the best of our knowledge, only Campa and Hernando (2006) partially researched it by analysing a timeframe starting from 1998 and ending in 2006. However, they focused their study on financial firms in Germany, the UK, France, and Italy. It left the effects of mega deal announcements unexplored, while Goergen and Renneboog (2004) cut off their sample at US\$ 100 million. We, on the other hand, propose an even higher cut off by analysing deals worth US\$ 500 million or more.

The objective of this paper is to analyse the short-term market reaction of bidder firms toward the announcement of a M&A mega deal in Continental Europe during the sixth merger wave. As shown in related extant literature, we will focus on companies' location as a determinant of investors' price reactions. We will analyse the existence of differences in investor reaction that may arise due to the legal origin of the acquirer and target firms within Continental Europe. To obtain a complete picture of the market

reaction, we do not only analyse changes in returns, but also expand the frame of analysis to volatilities and volume traded. The inclusion of the aforementioned market reaction indicators in this research is crucial, since it reveals reactions that would have been otherwise hidden by returns compensation.

We contribute to existing literature in several ways. First, we present more evidences to a limited stream of M&A research focused on Continental Europe. Research in this area is still centred on Anglo-Saxon countries, thereby increasing the difficulty in understanding Continental European markets. As a consequence, we also achieve a better understanding of investors' reaction in governance systems different from the Anglo-Saxon system. Second, our research benefits extant literature by studying European takeover bids launched during the sixth takeover wave, particularly for mega deals. It has been already demonstrated that each wave shows different patterns and characteristics from its antecedents (Martynova and Renneboog, 2008), and that the size of transactions should be considered determinants of market reaction (Rosen, 2006). Third, we aim to present an in-depth analysis of investors' reactions based on the legal origins of the companies involved in the deal.

The remainder of the paper is structured as follows. Section 2 presents a literature review about M&A announcements in Europe and postulates our hypothesis. In section 3, we describe the sample and methodology used, and in section 4 we analyse the empirical results obtained. Finally, section 5 presents our final remarks.

2. Literature review

Investors' reaction to M&A announcements involving large, medium, and small firms during the fifth wave was analysed in depth by Martynova and Renneboog (2011). The authors intensely exploited their 2,419 M&A announcements' 1993–2001 database to analyse factors affecting takeover announcement returns. They obtained a positive abnormal return of 0.53%, significant at the 1% level, to bidding shareholders. The list of determinants of the announcement returns is extensive, taking into consideration the takeover characteristics, characteristics of the bidding, and the target firms, as well as the legal environment and ownership structure. Regarding the legal environment, the

authors separately investigated the market reactions to bidding announcements, which involved companies that belonged to two different corporate governance regimes—the UK and Continental Europe. The authors found that shareholders of UK target firms obtained a higher premium than those of Continental Europe. This is especially true for domestic deals, wherein shareholders of UK targets obtained higher premiums than those of Continental Europe not only on the takeover announcement date, but also over two months prior to the event.

These results are consistent with Goergen and Renneboog (2004) and Martynova and Renneboog's (2006) analyses. The latter show that announcements made by bidding firms located in an English, German, or Scandinavian legal origin country returned a significant and positive abnormal return, while French and Socialist legal origin bidding firms did not obtain a significant return. However, Goergen and Renneboog (2004) studied 228 M&A announcements of European acquisitions undertaken between 1993 and 2000 for bids higher than US\$ 100 million. The authors found a positive bidders' reaction of 0.7% to announcements, with an announcement effect substantially larger for UK targets than for the Continental European ones. Furthermore, the authors found evidence that bids which involved a UK target returned a higher premium for both the target firm and the bidder. Moreover, bids on German, Austrian, and Swiss targets also showed significant positive returns for the bidding shareholder firm, although lower than in the previous case. Lastly, bids for southern European targets did not return a statistically significant result to the bidding firm.

The results obtained two years later by Faccio et al. (2006) only partially supported those obtained by Goergen and Renneboog (2004) and Martynova and Renneboog (2006, 2011). The authors studied the role of the listing status of targets in the acquirers' cumulated abnormal returns for a sample of 4,429 M&A announcements made by Western European companies during 1996–2001. They found that bids for publicly traded targets imply a negative cumulative abnormal return (not significant) to acquiring stockholders, whereas the stockholders of a privately held target obtained a positive and significant return. Moreover, the authors found no significance in stock returns for bids made by companies located in France, Germany, Italy, Netherlands, and Sweden.

Furthermore, taking into account the listing effects, Craninckx and Huyghebaert (2011) analysed intra-European deals during the fifth takeover wave. The authors found a positive and significant abnormal bidding return for the sample of firms willing to acquire privately held companies, but non-significantly different from zero returns if the target firms were listed.

Finally, Campa and Hernando (2004) examined the effect of 262 M&A announcements related to Continental European listed firms, along with the UK and Ireland, from 1998 to 2001. Contrary to Goergen and Renneboog (2004) and Martynova and Renneboog (2006, 2011), the authors did not find a reaction significance different from zero with respect to the M&A announcements for the bidding firm. Their results contradict those of previous authors, since they did not find any significance for friendly, domestic, or cross-border takeover bids. Their results regarding the relative size effect of the transaction remain unclear.

Following the Brown and Warner (1985) method, our hypothesis have been postulated in his null form:

Hypothesis 1 (H01): Market participants of Eurostoxx 50 companies do not find a mega M&A announcement informative.

We should expect to obtain positive abnormal returns (negative) if the announcement is positively (negatively) valued by investors. Furthermore, we should also obtain increases (decreases) in volatility and the number of shares traded if investors find the information value-relevant, and then, take an investment decision as a consequence, but they assess the information differently among them.

3. Sample selection and Methodology

In subsections 3.1 and 3.2, we present the sample and dataset used in this research, along with the method we propose to analyse the existence of differences in investor reaction to M&A announcements based on the legal origin of the acquirer and the target firm.

3.1. Sample selection

We obtained abnormal stock returns, volatilities, and trading volumes related to M&A announcements between January 1, 2003 and December 31, 2007 of the Eurostoxx 50 stock market index components. The daily adjusted trading data and the number of shares traded was obtained from Thompson Reuters 3000Xtra. Information on acquisition announcement dates and transaction size was collected from Thomson Reuters Knowledge database. Finally, accounting and financial characteristics of bidders, payment method, deal attitude, and industrial sector was collected from S&P Capital IQ.

To include a transaction in the study, its value should be greater than US\$ 500 million, offering a minimum relative size cut-off as proposed in Healy et al. (1992) and Alexandridis et al. (2017). Our cut-off is relatively higher than the one established in Goergen and Renneboog (2004)—US\$ 100 million—or in Faccio et al. (2006)—US\$ 5 million—in order to ensure a market reaction to the announcement.

We considered confounding effects, and as a consequence, cleaned events for companies announcing more than one deal within the pre-event window established in the ‘Methodology’. After all filters are applied, we are left with a final sample of 42 bidding companies announcing relevant transactions over 88 targets, which sums up to 92 events (see Appendix 1).

Both acquirers’ and targets’ firms are initially classified by legal origin following Djankov et al. (2003); that is, English, German, Scandinavian, French or Socialist. Appendix 1 lists the companies and their legal origin grouped as acquirers or targets. Evidently, the number of observations for Scandinavian legal origin does not allow us to perform an analysis by itself, so they have been added to the German legal origin sample.

Table 1 presents the number of announcements and total transactions values by year, as well as their statistics. There is some variation in the number of bids, 2007 being the year with the highest number of announcements, along with the 2004 Sanofi- Synthelabo

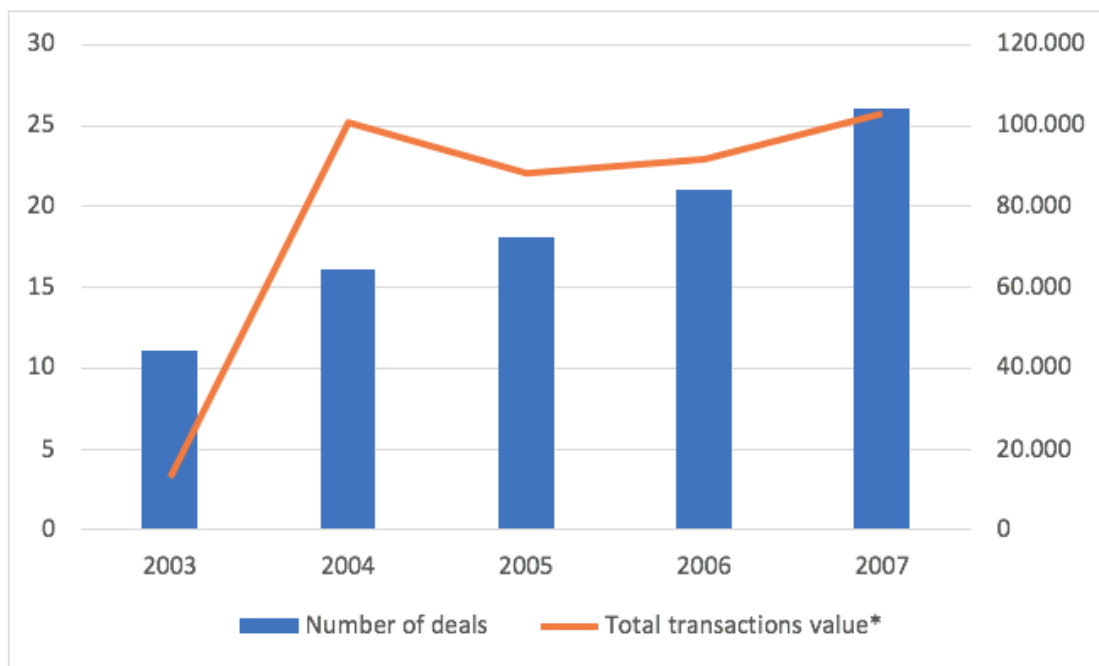
offer for 100% control of Aventis, the highest transaction, by value, for the examined period. Graph 1 illustrates how this transaction raises 2004 to the second position for the period with highest value bid, in total transaction value, following year 2007.

| Year | Number of deals | Total Transactions value* | Minimum | Maximum | Average | Standard deviation |
|------|-----------------|---------------------------|---------|-----------|----------|--------------------|
| 2003 | 11 | 12,750.69 | 589.19 | 1,990.00 | 1,159.15 | 491.60 |
| 2004 | 16 | 100,516.59 | 511.95 | 61,000.00 | 6,282.29 | 15,184.63 |
| 2005 | 18 | 88,041.05 | 500.70 | 30,720.00 | 4,891.17 | 8,200.83 |
| 2006 | 21 | 91,470.69 | 516.58 | 32,030.00 | 4,355.75 | 7,383.96 |
| 2007 | 26 | 102,732.49 | 500.00 | 24,260.00 | 3,951.25 | 5,425.45 |

* In million of dollars

Source: own elaboration based on data from Thompson Reuters Knowledge

Table 1. Sample statistics.



Source: own elaboration based on data from Thompson Reuters Knowledge

Graph 1. Number of deals and total transactions value per year

Tables 2 and 3 give information on market capitalisation, book value of Equity, Debt, and Total Assets, as well as the leverage for acquirers and EBIT and Net Income for target

firms. We note that acquirers are much bigger than targets in both market terms and book values.

| Bidders | Market Cap* | Equity book value* | Debt book value* | Total Assets* | Leverage |
|---------|-------------|--------------------|------------------|---------------|----------|
| 2003 | 26.96 | 21.70 | 50.73 | 231.77 | 0.78 |
| 2004 | 34.29 | 20.25 | 45.32 | 209.09 | 0.73 |
| 2005 | 40.75 | 22.70 | 74.74 | 271.38 | 0.76 |
| 2006 | 42.95 | 23.89 | 77.43 | 282.63 | 0.73 |
| 2007 | 50.68 | 29.27 | 72.21 | 280.67 | 0.76 |

*in billions of euros

Source: own elaboration based on data from S&P Capital IQ

Table 2. Sample statistics for acquirer firms

| Targets** | Market Cap* | Equity book value* | Debt book value* | Total Assets* | EBIT | Net Income |
|-----------|-------------|--------------------|------------------|---------------|------|------------|
| 2003 | 8.74 | 2.97 | 1.82 | 44.38 | 0.11 | -0.40 |
| 2004 | 22.70 | 15.13 | 13.47 | 96.95 | 3.29 | 2.09 |
| 2005 | 8.02 | 5.71 | 16.80 | 66.30 | 0.40 | 0.05 |
| 2006 | 8.73 | 4.34 | 3.91 | 36.78 | 0.74 | 0.63 |
| 2007 | 12.61 | 4.46 | 8.83 | 26.15 | 0.91 | 0.65 |

*in billions of euros

** public targets

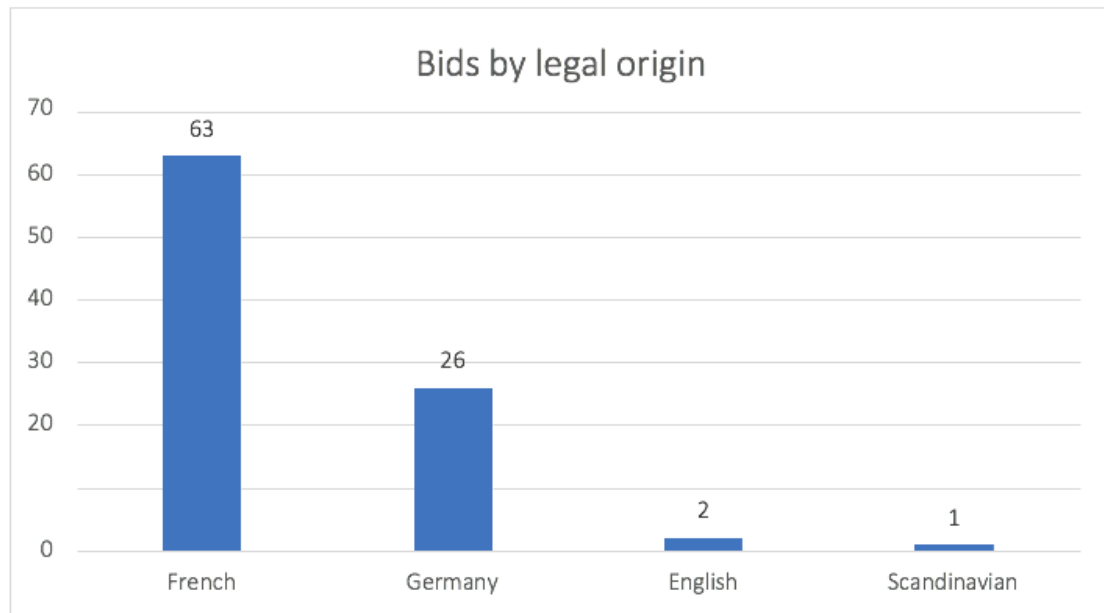
Source: own elaboration based on data from S&P Capital IQ.

Table 3. Sample statistics for target firms.

Target and acquirers' firm legal origins are summarised in Graphs 2 and 3. Our acquirers sample is mostly formed by companies located in a French legal origin country (France, Italy, and Spain), followed by German ones.

Our sample for targets is geographically more diversified than that of acquirers, since it contains acquisition announcements from target firms of 27 different countries. Once targets are grouped by legal origin, French legal origin targets are found to be predominant, followed by English, German, and Socialist legal origin targets.

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Source: own elaboration based on Djankov et al. (2003) classification.

Graph 2. Bids by legal origin.



Source: own elaboration based on Djankov et al. (2003) classification.

Graph 3. Targets by legal origin.

Finally, Table 4 provides a comprehensive description of events. As depicted, our sample mostly constitutes friendly cross-border M&A announcements, paid in cash, wherein the

primary strategy is to acquire a same industry target and obtain a majority stake or even 100% control.

| Year | 2003 | 2004 | 2005 | 2006 | 2007 | Total | % |
|---------------------|--------------------|------|------|------|------|-------|---------|
| Announcements | 11 | 16 | 18 | 21 | 26 | 92 | 100.00% |
| | Targets | | | | | | |
| Public | 5 | 5 | 9 | 7 | 6 | 32 | 34.78% |
| Private | 4 | 8 | 6 | 13 | 15 | 46 | 50.00% |
| Assets | 2 | 3 | 3 | 1 | 4 | 13 | 14.13% |
| NA | - | - | - | - | 1 | 1 | 1.09% |
| | Legal origin | | | | | | |
| Same | 5 | 5 | 7 | 10 | 9 | 36 | 39.13% |
| Different | 6 | 10 | 10 | 10 | 16 | 52 | 56.52% |
| NA | 0 | 1 | 1 | 1 | 1 | 4 | 4.35% |
| | Deal attitude | | | | | | |
| Hostile | 0 | 0 | 1 | 0 | 0 | 1 | 1.09% |
| Friendly | 8 | 14 | 14 | 18 | 24 | 78 | 84.78% |
| Friendly to Hostile | 0 | 0 | 0 | 1 | 0 | 1 | 1.09% |
| NA | 3 | 2 | 3 | 2 | 2 | 12 | 13.04% |
| | Geographical scope | | | | | | |
| Domestic deals | 4 | 3 | 4 | 5 | 4 | 20 | 21.74% |
| Cross-border deals | 7 | 12 | 13 | 16 | 21 | 69 | 75.00% |
| NA | - | 1 | 1 | - | 1 | 3 | 3.26% |
| | Payment method | | | | | | |
| Cash | 8 | 12 | 12 | 14 | 21 | 67 | 72.83% |
| Equity | 0 | 0 | 3 | 2 | 2 | 7 | 7.61% |
| Combinations | 0 | 1 | 0 | 1 | 0 | 2 | 2.17% |
| Assets | 0 | 0 | 0 | 1 | 0 | 1 | 1.09% |
| NA | 3 | 3 | 3 | 3 | 3 | 15 | 16.30% |
| | Strategy | | | | | | |
| Focus-same industry | 7 | 12 | 15 | 21 | 23 | 78 | 82.61% |
| Diversification | 4 | 4 | 3 | 0 | 3 | 14 | 17.39% |

Source: own elaboration based on data from S&P Capital IQ and Djankov et al. (2003) classification.

Table 4. Announcements characteristics.

3.2. Methodology

We follow the Brown and Warner (1985) event study methodology to assess the short-term wealth effects of the announcements for bidding firms' stockholders. Abnormal price changes (Beaver, 1968) and trading volumes (Kim and Verrecchia, 1991) are investors' responses to the disclosure of information. We test the aggregate market's average reaction by testing changes in prices through two different measures: abnormal returns (ARs) and absolute value abnormal returns (AARs). Additionally, we examine the activity of individual investors around M&A announcements by analysing the change in trading volumes. These three indicators of the market reaction to the release of information have been tested by a t-test when the data is normally distributed, and otherwise, by a non-parametric test (Corrado, 1989; Corrado and Zivney, 1992).

We compute ARs as the difference between the actual and normal returns, while the latter are defined as the expected returns without conditioning on the event. Expected returns are obtained from the market model. To avoid compensation of positive and negative reactions to acquisition announcements, we also examine stock price volatility measured as the absolute value of abnormal returns. Then, we proceed with the method similar to the ARs. AARs are computed in absolute values, and corrected by the mean value of the pre-event period. Finally, we define abnormal volume (AV) as the number of shares traded on a given day divided by the average shares traded over the pre- and post-event estimation periods.

As it is widely used in the literature, we do not limit our research to the day of the event. However, we do additionally examine a five-day event window, starting at day -2 until day +2, and the event day—day 0. Lastly, cumulative average abnormal returns (CAARs), cumulative average absolute value abnormal returns (CAAARs), and cumulative average abnormal volumes (CAAVs) are all obtained by adding AARs, AAARs, or AAVs across different time intervals within the event window. Appendix 2 describes computations in detail.

4. Results

In this section, we focus on the univariate analyses of CAARS, CAAARs, and CAAVs for bidding firms. We first present results obtained for the whole sample (see Table 5), the significance levels are tested according to the t-test for normally distributed samples or the Corrado test, otherwise. Tables 6 to 11 and 13 to 18 have identical structure; they present the investor's reaction to the announcements when we consider all possible combinations of legal origin of acquirers and targets. Each table shows accumulated results reported for five periods. First, for the accumulated periods of [-2,0] and [0,+2], we analyse for the presence of an information leakage prior to the announcement or a delayed reaction, respectively. Periods [-1,0] and [0,1] give us information on a very short-term anticipated or delayed market reaction. Lastly, for the cumulated period of [-2,2], we summarise the cumulative reaction for the whole analysed period. The results have been tested according to the t- or Wilcoxon test.

Table 5 shows that the mean AAR for acquirers is negative (-0.29%) and significant on the day of the event . This is true for both the event day and all accumulated studied periods—the two-days [0, 1] accumulated effect of -0.46%. Thus, investors react negatively to a mega deal announcement, showing a five-day accumulated negative reaction from up to -0.92% and significant at the 0.01 level. This investors reaction coexists with a significant increase in volatility and volume traded on the event day and all accumulated periods. To control for the possibility of a listing effect, we consider the public and private firm in acquirers' stock returns (not reported). The mean CAARs [-2,2] for acquirers of listed targets is negative (-0.97%) and significant at the 5% level, while the same measure for acquirers of private targets show a negative abnormal return of -0.99% and significant at the 5% level. Our results differ from those derived by Faccio et al. (2006), Martynova and Renneboog (2008), and Craninckx and Huyghebaert (2011). These authors also find negative CAARs for acquirers of listed targets, though they are not significant. The authors also report positive and significant returns for acquirers bidding for a non-listed firm.

| | Event period | | Event day | Event period | | Entire period |
|----------------------|--------------|----------|-----------|--------------|----------|---------------|
| | [-2,0] | [-1,0] | 0 | [0,1] | [0,2] | [-2,2] |
| CAARs (%) | -0.55 | -0.52 | -0.29 | -0.46 | -0.65 | -0.92 |
| p-value ^a | -2.68*** | -3.07*** | -2.43** | -2.73*** | -3.16*** | -3.43*** |
| CAAARs (%) | 0.59 | 0.43 | 0.32 | 0.61 | 0.54 | 1.12 |
| p-value ^b | 2.63*** | 1.71* | 2.53** | 3.79*** | 4.76*** | 4.60*** |
| CAAVs | 0.67 | 0.55 | 0.45 | 0.81 | 1.14 | 1.36 |
| p-value ^b | 2.11** | 2.58** | 3.03*** | 3.14*** | 3.75*** | 3.18*** |
| Observations | 92 | | | | | |

Source: own calculations based on data from Thomson Reuters 3000Xtra and S&P Capital IQ

a) *t*-test

b) Non-parametric test – Corrado test

Table 5. This table summarizes bidder firms' accumulated average abnormal returns, absolute value abnormal returns, and abnormal trading volumes around M&A announcements for the whole sample. Superscript ***, ** and * indicate significance at 1, 5 and 10% levels, respectively.

The results of testing for the influence of legal origin in investors' reaction are reported in Tables 6–8. Table 6 shows that investors of bidding firms bidding for a different legal origin target obtain a less negative return than investors of firms bidding for a same legal origin target. This reaction aligns with previous research, showing that firms may take advantage from operating in two different legal origin systems (Bris and Cabolis, 2008; Martynova and Renneboog, 2008). The results are graphically presented in Graph 4 for the accumulated period [-30, +10].

This analysis stands true for four out of five accumulated periods, with the announcement day being the only exception. However, none of the differences is significant for any of the accumulated periods analysed and at any significant level. More notably, subperiod [-2,0] returns an anticipated investor reaction of -1%, significant at the 0.05% level, for companies bidding for targets within the same legal origin.

| CAARs (%) | Different legal origin | p-value ^a | Same legal origin | p-value ^b | Same - different | p-value on difference ^c |
|--------------|------------------------|----------------------|-------------------|----------------------|------------------|------------------------------------|
| [-2,0] | -0.266 | 0.396 | -1.000 | 0.014** | -0.735 | 0.199 |
| [-1,0] | -0.309 | 0.291 ^b | -0.843 | 0.064* | -0.532 | 0.335 |
| [0, 1] | -0.504 | 0.034** | -0.393 | 0.085* | 0.112 | 0.926 |
| [0, 2] | -0.698 | 0.037** | -0.582 | 0.187 | -0.115 | 0.611 |
| [-2, 2] | -0.711 | 0.077* | -1.234 | 0.018** | -0.523 | 0.628 |
| Observations | 56 | | 36 | | | |

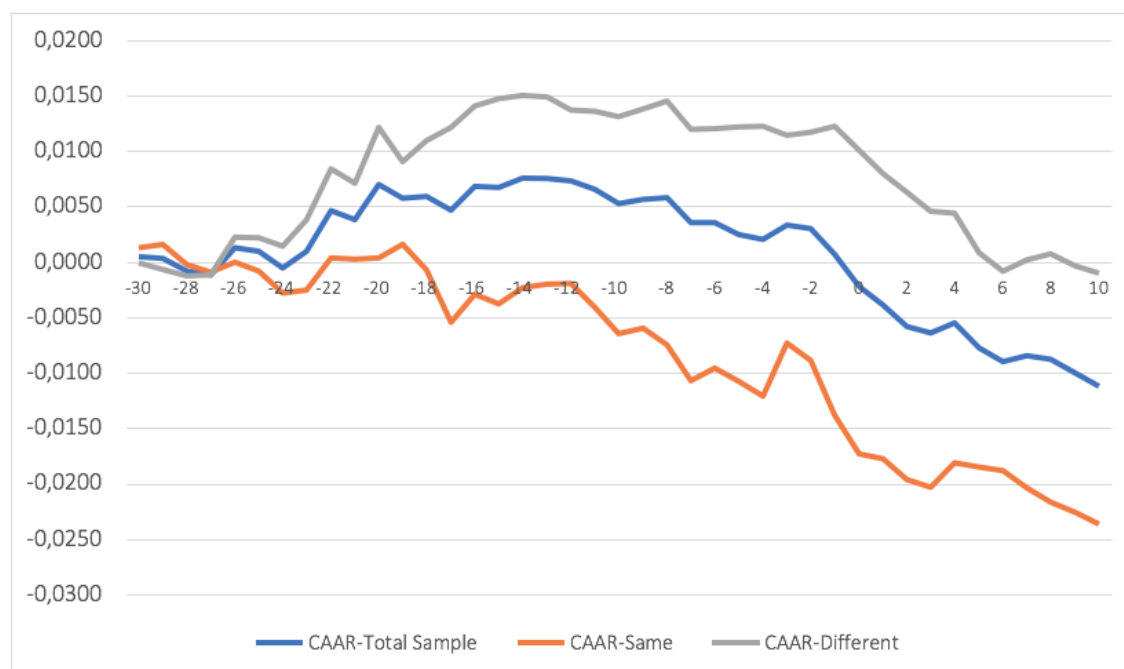
Source: own calculations based on data from Thomson Reuters 3000Xtra and S&P Capital IQ

a) t-test

b) Non-parametric test – Wilcoxon signed rank test

c) Non-parametric test – Wilcoxon rank sum test with continuity correction

Table 6. This table summarizes bidder firms' accumulated average abnormal returns taking into account bidder and target legal origin. Superscript ***, ** and * indicate significance at 1, 5 and 10% levels, respectively.



Source: own elaboration based on data from Thomson Reuters 3000Xtra and S&P Capital IQ.

Graph 4. Bidders' CAARs while bidding for a same or different legal origin target.

Regarding results for volatility, Table 7 shows an increase in volatility for periods [0,2] and [-2,2] only when bidding for a different legal origin target, although the effects in volatility are greater in some windows for operations with companies from the same legal

origin. This is because of the presence of highly biased distributions, and the presence of some outliers prevents us from obtaining a significant result. For the volume analyses, Table 8 show an increase in the number of shares traded at a significance level of 5% for the entire period just when bidding for a same legal origin target.

| CAAARs (%) | Different legal origin | p-value ^b | Same legal origin | p-value ^b | Same - different | p-value on difference ^c |
|--------------|------------------------|----------------------|-------------------|----------------------|------------------|------------------------------------|
| [-2,0] | 0.146 | 0.431 | 0.277 | 0.529 | 0.131 | 0.675 |
| [-1,0] | 0.171 | 0.711 | 0.283 | 0.798 | 0.113 | 0.971 |
| [0, 1] | 0.211 | 0.229 | 0.454 | 0.271 | 0.243 | 0.845 |
| [0, 2] | 0.215 | 0.012** | 0.402 | 0.171 | 0.187 | 0.634 |
| [-2, 2] | 0.170 | 0.044** | 0.316 | 0.371 | 0.146 | 0.734 |
| Observations | 56 | | 36 | | | |

Source: own calculations based on data from Thomson Reuters 3000Xtra and S&P Capital IQ

b) Non-parametric test – Wilcoxon signed rank test

c) Non-parametric test – Wilcoxon rank sum test with continuity correction

Table 7. This table summarizes bidder firms' accumulated average absolute value abnormal returns taking into account bidder and target legal origin. Superscript ***, ** and * indicate significance at 1, 5 and 10% levels, respectively.

| CAAVs | Different legal origin | p-value ^b | Same legal origin | p-value ^b | Same - different | p-value on difference ^c |
|--------------|------------------------|----------------------|-------------------|----------------------|------------------|------------------------------------|
| [-2,0] | 0.180 | 0.465 | 0.291 | 0.174 | 0.110 | 0.399 |
| [-1,0] | 0.265 | 0.302 | 0.292 | 0.259 | 0.027 | 0.604 |
| [0, 1] | 0.398 | 0.188 | 0.418 | 0.123 | 0.019 | 0.651 |
| [0, 2] | 0.353 | 0.394 | 0.426 | 0.051* | 0.072 | 0.350 |
| [-2, 2] | 0.223 | 0.622 | 0.349 | 0.048** | 0.126 | 0.208 |
| Observations | 56 | | 35 | | | |

Source: own calculations based on data from Thomson Reuters 3000Xtra and S&P Capital IQ

a) Non-parametric test – Wilcoxon signed rank test

b) Non-parametric test – Wilcoxon rank sum test with continuity correction

Table 8. This table summarizes bidder firms' accumulated average abnormal volume taking into account bidder and target legal origin. Superscript ***, ** and * indicate significance at 1, 5 and 10% levels, respectively.

Tables 9–11 show CAARs, CAAARs, and CAAVs results obtained when splitting the sample between the two most predominant bidders' legal origins in our sample—French and German. Table 9 shows that investors of firms belonging to German legal origin obtain more negative returns than investors of French legal origin ones. This

result is consistent for four accumulated periods examined, with a significant positive difference at 5% level for French legal origin investors in periods [0,1] (+0.838) and [-2,2] (1%), and at a 1% level for period [0,2] (+1.18%). Our results, surprisingly, contradict previous evidence that German or Scandinavian legal origin bidders generate a significantly positive announcement effect (Goergen and Renneboog, 2004) or with no significant return (Faccio et al. 2006). There is no significant effect for operations where the bidder is from a French legal origin. Our results align with previous literature which reported a lack of significance in stock returns in their analysis of southern European countries (Goergen and Renneboog, 2004), French and the EU enlargement legal origin countries (Martynova and Renneboog, 2006), and some by-country analyses in Faccio et al. (2006). Regarding the results in Table 10 on the CAAARs, there is a significant and positive increase in volatility when the bidder is from German legal origin. Contrary to the results obtained for volatility, abnormal and positive volume of shares traded is obtained from the French legal origin subsample (see Table 11) for all accumulated periods. Notwithstanding, none of the differences are significant at any level.

| CAARs (%) | Bidder French legal origin | p-value ^b | Bidder German legal origin | p-value ^a | French - German | p-value on difference ^c |
|--------------|----------------------------|----------------------|----------------------------|----------------------|-----------------|------------------------------------|
| [-2,0] | -0.425 | 0.111 | -0.786 | 0.123 | 0.361 | 0.360 |
| [-1,0] | -0.370 | 0.284 | -0.718 | 0.098* | 0.348 | 0.243c |
| [0, 1] | -0.207 | 0.312 | -1.045 | 0.002*** | 0.838 | 0.018** |
| [0, 2] | -0.309 | 0.353 | -1.489 | 0.001*** | 1.180 | 0.008*** |
| [-2, 2] | -0.587 | 0.183 | -1.588 | 0.0098*** | 1.000 | 0.022** |
| Observations | 63 | | 26 | | | |

Source: own calculations based on data from Thomson Reuters 3000Xtra and S&P Capital IQ

a) *t*-test.

b) Non-parametric test – Wilcoxon signed rank test.

c) Non-parametric test – Wilcoxon rank sum test with continuity correction.

Table 9. This table summarizes bidder firms' accumulated average abnormal return taking into account the legal origin of the bidder. Superscript ***, ** and * indicate significance at 1, 5 and 10% levels, respectively.

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| CAARs (%) | Bidder French legal origin | p-value <i>b</i> | Bidder German legal origin | p-value <i>b</i> | French - German | p-value on difference <i>c</i> |
|--------------|----------------------------|------------------|----------------------------|------------------|-----------------|--------------------------------|
| [-2,0] | 0.185 | 0.674 | 0.140 | 0.565 | 0.045 | 0.525 |
| [-1,0] | 0.186 | 0.937 | 0.206 | 0.532 | -0.021 | 0.573 |
| [0, 1] | 0.310 | 0.449 | 0.304 | 0.165 | 0.006 | 0.254 |
| [0, 2] | 0.288 | 0.152 | 0.272 | 0.014** | 0.016 | 0.212 |
| [-2, 2] | 0.222 | 0.293 | 0.170 | 0.059* | 0.052 | 0.374 |
| Observations | 63 | | 26 | | | |

Source: own calculations based on data from Thomson Reuters 3000Xtra and S&P Capital IQ.

b) Non-parametric test – Wilcoxon signed rank test.

c) Non-parametric test – Wilcoxon rank sum test with continuity correction.

Table 10. This table summarizes bidder firms' accumulated average absolute value abnormal return taking into account the legal origin of the bidder. Superscript ***, ** and * indicate significance at 1, 5 and 10% levels, respectively.

| CAAVs | Bidder French legal origin | p-value <i>b</i> | Bidder German legal origin | p-value <i>b</i> | French - German | p-value on difference <i>c</i> |
|--------------|----------------------------|------------------|----------------------------|------------------|-----------------|--------------------------------|
| [-2,0] | 0.257 | 0.097* | 0.131 | 0.727 | 0.126 | 0.205 |
| [-1,0] | 0.325 | 0.067* | 0.169 | 0.822 | 0.155 | 0.218 |
| [0, 1] | 0.453 | 0.027** | 0.330 | 0.653 | 0.123 | 0.350 |
| [0, 2] | 0.466 | 0.026** | 0.220 | 0.708 | 0.245 | 0.281 |
| [-2, 2] | 0.334 | 0.036** | 0.138 | 0.727 | 0.196 | 0.261 |
| Observations | 63 | | 26 | | | |

Source: own calculations based on data from Thomson Reuters 3000Xtra and S&P Capital IQ.

b) Non-parametric test – Wilcoxon signed rank test.

c) Non-parametric test – Wilcoxon rank sum test with continuity correction.

Table 11. This table summarizes bidder firms' accumulated average abnormal volume taking into account the legal origin of the bidder. Superscript ***, ** and * indicate significance at 1, 5 and 10% levels, respectively.

We have checked the composition of our two samples for several determinants of price reaction. Table 12 presents the percentage of big and small relative size transactions (relative size of the target out of the bidder's size, small relative size transactions compute for the number of transactions at the last tercile, and big relative size transactions at the highest tercile, while transactions have been sorted from the highest relative size to the lowest), type of acquisition (full bid, majority, or minority stake), strategy (concentration, diversification), and cross-border or domestic. As almost all transactions

are friendly and paid in cash, we do not consider them as price determinant. As is evident, samples do not differ much in composition.

| Price determinants | French | | German | |
|---------------------|--------------|--------|--------------|--------|
| | Observations | % | Observations | % |
| Small relative size | 16 | 25.40% | 10 | 38.46% |
| Big relative size | 24 | 38.10% | 5 | 19.23% |
| Minority stake | 15 | 23.81% | 2 | 7.69% |
| Majority stake | 25 | 39.68% | 16 | 61.54% |
| Full bid | 15 | 23.81% | 4 | 15.38% |
| Concentration | 53 | 84.13% | 22 | 84.62% |
| Diversification | 10 | 15.87% | 4 | 15.38% |
| Domestic | 16 | 25.40% | 4 | 15.38% |
| Cross-border | 46 | 73.02% | 21 | 80.77% |

Source: own calculations based on data from Thomson Reuters 3000Xtra and S&P Capital IQ.

Table 12: Bids characteristics of French and German legal origin sample

Tables 13–18 summarise the bidder firm's investors' reaction taking into account both the bidders' (French or German) and targets' legal origin (French, English, German, or Socialist). More notably, the sample sizes are extremely small. Tables 13–15 show CAARs, CAAARS, and CAAVs results for French legal origin bidders and English, German, or Socialist targets. Table 9 shows no abnormal returns of French legal origin investors to the announcements, and this result remains the same (see Table 13) even if we split our French legal origin sample by the target's legal origin (there is a significant difference at the 10% level when bidding for a Socialist target, probably due to multiple testing problem). This is partially contrary to results obtained by Goergen and Renneboog (2004). The authors found a significant and positive higher premium for bids from a UK and German target, although the latter was not as high as the former.

With regard to volatility, Table 14 shows that bidding for a German legal origin company creates controversy among French legal origin investors, since we obtained significant increases in volatility in all periods for this specific subsample. No significance or even less than average volatilities are obtained for English or Socialist subsamples. This increase in volatility is also accompanied by an increase in the number of shares traded for English and German targets subsample, as shown in Table 15.

Increases in volatility and volume traded indicate that investors find the announcement adequately value-relevant in order to make investment decisions on their portfolio according to their beliefs. Compensation among positive and negative abnormal returns does not allow appreciating the existence of investors' reaction; therefore, the inclusion in the analyses of volatility and traded volume is crucial.

| CAARs (%) | Bidder French Target English | p-value ^a | Bidder French Target German | p-value ^a | Bidder French Target Socialist | p-value ^a |
|--------------|---------------------------------|----------------------|--------------------------------|----------------------|-----------------------------------|----------------------|
| [-2,0] | 0.564 | 0.330 | -0.421 | 0.585 | -0.928 | 0.222 |
| [-1,0] | 0.363 | 0.417 | -0.229 | 0.717 | -0.436 | 0.073* |
| [0, 1] | -0.545 | 0.259 | 0.816 | 0.297 | 0.187 | 0.647 |
| [0, 2] | -0.789 | 0.194 | 1.020 | 0.470 | 0.124 | 0.754 |
| [-2, 2] | -0.350 | 0.940 ^b | 0.681 | 0.635 | -0.730 | 0.398 |
| Observations | 16 | | 8 | | 6 | |

Source: own calculations based on data from Thomson Reuters 3000Xtra and S&P Capital IQ.

a) t-test.

b) Non-parametric test – Wilcoxon rank sum test with continuity correction.

Table 13. This table summarizes bidder firms' accumulated average abnormal return taking into account the legal origin of the bidder and the target. Superscript ***, ** and * indicate significance at 1, 5 and 10% levels, respectively.

| CAAARs (%) | Bidder French Target English | p-value ^b | Bidder French Target German | p-value ^b | Bidder French Target Socialist | p-value ^b |
|--------------|---------------------------------|----------------------|--------------------------------|----------------------|-----------------------------------|----------------------|
| [-2,0] | 0.062 | 1.000 | 0.358 | 0.008*** | -0.16 | 0.438 |
| [-1,0] | 0.085 | 0.980 | 0.416 | 0.008** | -0.372 | 0.031** |
| [0, 1] | 0.151 | 0.900 | 0.426 | 0.055* | -0.280 | 0.063* |
| [0, 2] | 0.101 | 0.669 | 0.481 | 0.055* | -0.134 | 0.156 |
| [-2, 2] | 0.080 | 0.744 | 0.397 | 0.039** | -0.097 | 0.438 |
| Observations | 16 | | 8 | | 6 | |

Source: own calculations based on data from Thomson Reuters 3000Xtra and S&P Capital IQ.

b) Non-parametric test – Wilcoxon signed rank test.

c) Non-parametric test – Wilcoxon rank sum test with continuity correction.

Table 14. This table summarizes bidder firms' accumulated average abnormal absolute value return taking into account the legal origin of the bidder and the target. Superscript ***, ** and * indicate significance at 1, 5 and 10% levels, respectively.

| CAAVs | Bidder French Target English | p-value <i>b</i> | Bidder French Target German | p-value <i>b</i> | Bidder French Target Socialist | p-value <i>b</i> |
|--------------|---------------------------------|------------------|-----------------------------------|------------------|---|------------------|
| [-2,0] | 0.297 | 0.093* | 0.362 | 0.641 | -0.210 | 0.156 |
| [-1,0] | 0.432 | 0.046** | 0.604 | 0.094* | -0.272 | 0.094* |
| [0, 1] | 0.605 | 0.052* | 0.822 | 0.052* | -0.322 | 0.031** |
| [0, 2] | 0.566 | 0.074* | 0.964 | 0.250 | -0.325 | 0.031** |
| [-2, 2] | 0.410 | 0.066* | 0.558 | 0.313 | -0.291 | 0.031** |
| Observations | 16 | | 8 | | 6 | |

Source: own calculations based on data from Thomson Reuters 3000Xtra and S&P Capital IQ.

b) Non-parametric test – Wilcoxon signed rank test.

c) Non-parametric test – Wilcoxon rank sum test with continuity correction.

Table 15. This table summarizes bidder firms' accumulated average abnormal volume taking into account the legal origin of the bidder and the target. Superscript ***, ** and * indicate significance at 1, 5 and 10% levels, respectively.

Table 16 shows that German legal origin investors obtain an even more negative return when the firm is bidding for an English target—up to -1.78% for the period [0,2]—or a Socialist target (-1.80% for the entire period). This return does not go along with increases in volatility (see Table 17), and volume traded does not increase either (see Table 18) beyond marginal results at the 10% significance level.

| CAARs (%) | Bidder German Target English | p-value <i>a</i> | Bidder German Target French | p-value <i>a</i> | Bidder German Target Socialist | p-value <i>a</i> |
|--------------|------------------------------------|------------------|-----------------------------------|------------------|---|------------------|
| Event window | % | | % | | % | |
| [-2,0] | -1.171 | 0.149 | 0.583 | 0.749 | -0.046 | 0.953 |
| [-1,0] | -1.251 | 0.070* | -0.095 | 0.953 | 0.202 | 0.792 |
| [0, 1] | -1.262 | 0.0061*** | -0.743 | 0.570 | -1.022 | 0.179 |
| [0, 2] | -1.784 | 0.0067*** | -0.835 | 0.574 | -1.597 | 0.081* |
| [-2, 2] | -1.718 | 0.015** | 0.195 | 0.932 | -1.808 | 0.037** |
| Observations | 10 | | 5 | | 5 | |

Source: own calculations based on data from Thomson Reuters 3000Xtra and S&P Capital IQ.

a) *t*-test.

c) Non-parametric test – Wilcoxon rank sum test with continuity correction.

Table 16. This table summarizes bidder firms' accumulated average abnormal return taking into account the legal origin of the bidder and the target. Superscript ***, ** and * indicate significance at 1, 5 and 10% levels, respectively.

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| CAAARs (%) | Bidder German Target English | p-value ^b | Bidder German Target French | p-value ^b | Bidder German Target Socialist | p-value ^b |
|--------------|------------------------------|----------------------|-----------------------------|----------------------|--------------------------------|----------------------|
| Event window | % | | % | | % | |
| [-2,0] | 0.161 | 0.846 | 0.479 | 0.188 | -0.144 | 0.313 |
| [-1,0] | 0.268 | 0.846 | 0.554 | 0.438 | -0.043 | 1.000 |
| [0, 1] | 0.342 | 0.846 | 0.425 | 0.313 | 0.333 | 0.813 |
| [0, 2] | 0.341 | 0.084* | 0.276 | 0.188 | 0.376 | 0.313 |
| [-2, 2] | 0.194 | 0.084* | 0.241 | 0.313 | 0.173 | 0.625 |
| Observations | 10 | | 5 | | 5 | |

Source: own calculations based on data from Thomson Reuters 3000Xtra and S&P Capital IQ.

b) Non-parametric test – Wilcoxon signed rank test.

c) Non-parametric test – Wilcoxon rank sum test with continuity correction.

Table 17. This table summarizes bidder firms' accumulated average abnormal absolute value return taking into account the legal origin of the bidder and the target. Superscript ***, ** and * indicate significance at 1, 5 and 10% levels, respectively.

| CAAVs | Bidder German Target English | p-value ^b | Bidder German Target French | p-value ^b | Bidder German Target Socialist | p-value ^b |
|--------------|------------------------------|----------------------|-----------------------------|----------------------|--------------------------------|----------------------|
| [-2,0] | -0.102 | 0.864 | 0.864 | 0.156 | -0.126 | 0.125 |
| [-1,0] | -0.105 | 0.275 | 1.072 | 0.156 | -0.106 | 0.313 |
| [0, 1] | 0.001 | 0.695 | 1.550 | 0.094* | -0.066 | 0.813 |
| [0, 2] | -0.039 | 0.625 | 1.083 | 0.094* | -0.028 | 0.813 |
| [-2, 2] | -0.093 | 0.160 | 0.824 | 0.156 | -0.067 | 0.813 |
| Observations | 10 | | 5 | | 5 | |

Source: own calculations based on data from Thomson Reuters 3000Xtra and S&P Capital IQ.

b) Non-parametric test – Wilcoxon signed rank test.

c) Non-parametric test – Wilcoxon rank sum test with continuity correction.

Table 18. This table summarizes bidder firms' accumulated average abnormal volume taking into account the legal origin of the bidder and the target. Superscript ***, ** and * indicate significance at 1, 5 and 10% levels, respectively.

Table 19 presents a summary of the reactions.

| Bidder legal origin | Abnormal returns | Abnormal volatilities | Abnormal volume | Target legal origin | Abnormal returns | Abnormal volatilities | Abnormal volume |
|---------------------|------------------|-----------------------|-----------------|---------------------|------------------|-----------------------|-----------------|
| TOTAL SAMPLE | YES (-) | YES (+) | YES (+) | - | - | - | - |
| French | NO | NO | YES (+) | English | NO | NO | YES |
| | | | | German | NO | YES (+) | SOME |
| | | | | Socialist | NO | SOME | NO |
| Germany | YES (-) | SOME (+) | NO | English | YES (-) | SOME (+) | NO |
| | | | | French | NO | NO | SOME (+) |
| | | | | Socialist | SOME (-) | NO | NO |

Source: own elaboration

Table 19. Market reaction to mega M&As announcements.

5. Final remarks

This paper analyses investors' short-term reaction to mega merger and acquisition announcements during the sixth merger wave in Continental Europe. We also analyse the effect of legal origin on this reaction.

Our main result is a short-term negative abnormal return for the bidder stockholders' firms as a consequence of the announcement, which contradicts previous evidence from the fifth merger wave in Continental Europe. This reaction is also accompanied with a significant above average level of market volatility and volume traded, thus indicating a strong controversy to market participants. Considering the listing effects on returns, we find that both bids for listed or unlisted targets concur in a negative and significant abnormal return. This result also contradicts previous literature for Continental Europe. A plausible explanation for both negative results for not only the whole sample, but also when considering listed and unlisted targets, may be due to our focus on analysing mega deals. In this scenario, transaction size is a determinant for investors than other factors.

When we take into consideration the legal origin of the bidders—French or German—we have been able to determine that the negative return reaction for the whole sample is

mostly due to Germans' legal origin bidders, although they only represent a little less than 30% of the sample. This is because German legal origin bidding firms concentrate the negative return reaction on the announcements—specifically, negative results concentrate on bids over English and Socialist legal origin target. Moreover, French legal origin bidders do not seem to react, since abnormal returns are not significant. Widening the analysis of French legal origin bidders, we also see that stockholders react with an increase in volatilities and the number of shares traded when bidding for a German legal origin target. Hence, for French legal origin investors, a mega deal announcement embodies sufficient information to decide on its portfolio, but it only can be seen as enhancing the frame of analysis for volatility and volume traded.

We would like to deepen our analysis by considering more variables, particularly target characteristics that could also determine investor reactions. However, the size of our sample does not allow such an analysis; otherwise, by increasing the number of observations through establishing our cut off at a lower transaction value may not reflect purely the stockholders' reaction to a mega transaction.

REFERENCES

Alexandridis, G., Antypas, N., and N.G. Travlos (2017). Value creation from M&As: New evidence. *Journal of Corporate Finance*, in press.

Beaver, W. (1968). The information content of annual earnings announcements. *Journal of Accounting Research*. Vol. 6, 67-92.

Bris, A., Cabolis, C. (2008). The value of investors protection: Firm evidence from cross-border mergers. *The Review of Financial Studies*, vol 21 (2), 605-648

Brown, S.J. and Warner, W.B. (1985). Using daily stock return: the case of event studies. *Journal of Financial Economics*, vol 14 (1), 3-31.

Campa, J. M. and Hernando, I. (2004). Shareholder Value Creation in European M&As. *European Financial Management*. Vol. 10(1), 47-81.

Campa, J. M. and Hernando, I. (2006). M&A Performance in the European Financial Industry. *Journal of Banking and Finance*, Vol. 30(12), 3367-3392.

Corrado, C.J. (1989). A nonparametric test for abnormal security-price performance in event studies. *Journal of Financial Economics*, Vol. 23(2), 385-395.

Corrado, C.J. and Zivney, T.L. (1992). The specification and power of the sign test in event study hypothesis tests using daily stock returns. *Journal of Financial and Quantitative Analysis*, Vol. 27, 465-478.

Craninckx, K. and Huyghebaert, N. (2011) Can Stock Markets Predit M&A Failure? A Study of European Transactions in the Fifth Takeover Wave. *European Financial Management*, Vol. 17 (1), 9-45.

Djankov, S., La Porta, R., Lopez-de-Silanes, F., Shleifer, A. (2003). Courts. *The Quarterly Journal of Economics*, vol 118 (2), 453-517.

Faccio, M., McConnell, J. J. and Stolin, D. (2006). Returns to Acquirers of Listed and Unlisted Targets. *Journal of Financial and Quantitative Analysis*, vol 41 (1), 197-220.

Goergen, M., Renneboog, L. (2004). Shareholder wealth effects of European domestic and cross-border takeover bids. *European Financial Management*, vol (10), 9-45.

Healy, P.M., Palepu, K.G. and Ruback, R.S. (1992) Does Corporate Performance improve after mergers? *Journal of Financial Economics*, vol. 31, 135-155.

Kim, O. and Verrecchia, R. E. (1991). Trading Volume and Price Reactions to Public Announcements. *Journal of Accounting Research*, vol. 29 (2), 302-321.

European mega deals during the sixth merger wave. Is the legal origin of the bidder and the target a determinant of short-term investor reaction?

Martynova, M. and Renneboog, L. (2006). Mergers and Acquisitions in Europe in: Renneboog, L. (ed.), *Advances in Corporate Finance and Asset Pricing*, 15-76. Elsevier, Amsterdam.

Martynova, M. and Renneboog, L. (2008). A century of corporate takeovers: What have we learned and where do we stand?. *Journal of Banking & Finance*. vol. 32, 2148-2177.

Martynova, M. and Renneboog, L. (2011) The Performance of the European Market for Corporate Control: Evidence from the Fifth Takeover Wave. *European Financial Management*, vol. 17 (2), 208-259.

Menendez, S. (2005). Market valuation of the analysts' recommendations: the Spanish stock market. *Applied Financial Economics*, vol. 15, 509-518.

Rosen, R. J. (2006). Merger Momentum and Investor Sentiment: The Stock Market Reaction to Merger Announcements. *Journal of Business*. vol. 79 (2), 987-1017.

APPENDIX 1: ACQUIRERS AND TARGETS

| Acquirers | Acquirer | |
|----------------------|----------|--------------|
| | Country | Legal Origin |
| Anheuser-Busch Inbev | Belgium | French |
| Nokia | Finland | Scandinavian |
| Air Liquide | France | French |
| Axa | France | French |
| BNP Paribas | France | French |
| Carrefour | France | French |
| France Telecom | France | French |
| Gaz de France | France | French |
| L'Oreal | France | French |
| Saint Gobain | France | French |
| Sanofi | France | French |
| Schneider Electric | France | French |
| Societe Generale | France | French |
| Unibail | France | French |
| Vinci | France | French |
| Vivendi | France | French |
| Allianz | Germany | German |
| Bayer Schering | Germany | German |
| Daimler | Germany | German |
| Deutsche Bank | Germany | German |
| Deutsche Borse | Germany | German |
| Deutsche Telekom | Germany | German |
| E.ON | Germany | German |
| Munich Re | Germany | German |
| RWE | Germany | German |
| SAP | Germany | German |
| Siemens | Germany | German |

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| | | |
|---------------------------------|-------------|---------|
| CRH | Ireland | English |
| Assicurazioni Generali | Italy | French |
| Enel | Italy | French |
| ENI | Italy | French |
| Intesa Sanpaolo | Italy | French |
| Telecom Italia | Italy | French |
| Unicredit | Italy | French |
| ArcelorMittal | Luxembourg | French |
| ING | Netherlands | French |
| Koninklijke Philips Electronics | Netherlands | French |
| Banco Bilbao Vizcaya Argentaria | Spain | French |
| Banco Santander Central Hispano | Spain | French |
| Iberdrola | Spain | French |
| Repsol YPF | Spain | French |
| Telefonica | Spain | French |

| Targets | Target Country | Legal Origin |
|--|----------------|-----------------|
| City Sued Shopping Center | Austria | German Atacadao |
| Distribuicao Comercio e Industria Limitada | Brazil | French |
| TIM Celular | Brazil | French |
| Telefonica Movil Chile | Chile | French |
| China Citic Bank | China | Socialist |
| Maurel et Prom's assets in Congo | Congo | French |
| AGF Assurances | France | French |
| Autoroutes du Sud de la France | France | French |
| Aventis | France | French |
| Cofiroute | France | French |
| Industrial Turbines Business of Alstom | France | French |
| Pinault Bois et Materiaux | France | |

French

| | | |
|---|-------------------|-----------|
| Office Properties in Paris and Brussels | Belgium | |
| French | | |
| Bayerische Hypo-und Vereinsbank | Germany | German |
| DaimlerChrysler Luft- und Raumfahrt Holding | Germany | German |
| Gabriel Sedlmayr Spaten-Franziskaner-Brau | Germany | German |
| Messer Griesheim GmbH's gas operations | Germany | German |
| Norisbank | Germany | |
| German | | |
| Saar Ferngas | Germany | German |
| Schering | Germany | German |
| STADTWERKE LEIPZIG | Germany | German |
| Ghana Telecom | Ghana Hungary | English |
| MOL Foldgazaralo Rt MOL Storage | Italy | Socialist |
| 2S Banca | | French |
| Assicurazioni Generali | Italy Italy Italy | French |
| Banca Nazionale del Lavoro | Italy | French |
| CAAM SGR | | French |
| Capitalia | | French |
| Monte dei Paschi di Siena's (MPS's) bankassurance and pension operations | Italy | French |
| Olimpia | Italy | French |
| Riunione Adriatica di Sicurta | Italy | French |
| Telecom Italia Mobile | Italy | French |
| Toro Assicurazioni | Italy | French |
| Unicredito Italiano | | French |
| Wind Telecomunicazioni | | French |
| Arcelor | Luxembourg | French |
| Quilmes Industrial | Luxembourg | French |
| Grupo Financiero BBVA Bancomer S A de C V | Mexico | French |
| Euronext | Netherlands | French |

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| | | |
|--|--------------------|--------------|
| Orange Nederland | Netherlands | French |
| Rodamco | Netherlands | French |
| Zentiva | Netherlands | French |
| TeleRing | Norway | Scandinavian |
| Polska Telefonía Cyfrowa | Poland Portugal | Socialist |
| SECIL Companhia Geral de Cal e Cimento | Romania Russia | French |
| Electrica Muntenia Sud | Russia | Socialist |
| OGK-4 | | Socialist |
| RESO-Garantiya | | Socialist |
| Severneftegazprom | Russia | Socialist |
| United Financial Group | Russia | Socialist |
| Orange Slovensko | Slovakia | Socialist |
| Slovenske Elektrarne | Slovakia | Socialist |
| Compania Espanola de Petroleos | Spain | French |
| Endesa | Spain | French |
| Terra Lycos | | French |
| Terra Networks | | French |
| Wind Farms in Spain and Italy | Spain/Italy Sweden | French |
| Dahl International | Switzerland | Scandinavian |
| Winterthur Swiss Insurance | Thailand | German |
| TMB Bank | | English |
| Tupras Turkiye Petrol Rafinerileri | Turkey | French |
| Avent Holdings | UK | English |
| Body Shop International | | English |
| BPB | | English |
| Burren Energy | UK | English |
| Caledonia Oil and Gas | UK | English |
| Four Seasons Healthcare | | English |
| London Stock Exchange | | English |

| | | | |
|--------------------------------|----|-------|---------|
| O2 | UK | US | English |
| BMG Music Publishing Group | | US | English |
| Drive Financial | | | English |
| Energy East Corp | | | English |
| Excelerate Energy | | US | English |
| GMAC Commercial Mortgage | | US | English |
| GSM Network of Cingular | | | English |
| Laredo National Bancshares | | | English |
| Lumileds Lighting | | US | English |
| MONY Group | | US | English |
| NAVTEQ Corp | | | English |
| OutlookSoft | | | English |
| Pelco | | | English |
| Retek | | US | English |
| Shenzi Deep Water Oil Field | | US | English |
| Sovereign Bancorp | | US | English |
| Ashland Global Holdings | | US | English |
| 128 Commercial properties | | NA NA | NA NA |
| Midland | | NA | NA |
| Non-Listed capital risk assets | | | |

APPENDIX 2: ABNORMAL RETURN AND VOLUME CALCULATIONS

Abnormal return

The return of security i over period t is defined as:

$$R_{it} = E(R_{it} | X_t)_{it} + AR_{it} \quad [1]$$

where, R_{it} , $E(R_{it}|X_t)_{it}$ and AR_{it} are the actual, normal, and abnormal returns, respectively, and X_t is the conditioning information set for the normal return model.

We compute expected or normal returns by using the market model, thus we assume that normal return is given by a linear relationship between the stock and the market return.

$$E(R_{i,t} | X_{i,t}) = a_i + b_i R_{m,t} \quad [2]$$

Where:

$$R_{i,t} = \frac{1}{N} \sum_{j=1}^N AR_{i,t} \quad [3]$$

We estimate the security normal returns through a pre-event period of 151 days starting on day -170 to day -20 been day 0 the M&A announcement date.

Average abnormal returns (AARs) has been obtain averaging abnormal returns of each event. Thus, AARs is calculated as:

$$AAR_t = \frac{1}{N} \sum_{i=1}^N AR_{i,t} \quad [4]$$

Cumulative average abnormal return (CAAR) has been calculated by adding the average daily abnormal return for different time intervals (a, b), within the event window [-2, +2].

Absolute Abnormal Return

Absolute abnormal returns has been obtain applying the absolute value of each abnormal return. Then, we proceed averaging them, thus AAAR is given by:

$$AAAR_t = \frac{1}{N} \sum_{i=1}^N |AR_{it}| - \overline{AAAR_t} \quad [5]$$

Where $\overline{AAAR_t}$ is the AAAR mean over the pre-event period.

Cumulative average absolute abnormal return (CAAAR) is obtained by adding average daily absolute abnormal returns across different time intervals (a, b), within the event window [-2, +2].

Abnormal Volume

Following Menendez (2005), we define abnormal trading volumes for stock i on day t as:

$$AV_{it} = \frac{V_{it}}{\frac{\sum_{i=-84}^{-1} V_{it} + \sum_{i=11}^{84} V_{it}}{2} \cdot \frac{1}{150}} \quad [6]$$

Where V_{it} is the traded volume in euros of stock i on day t .

Once abnormal daily volumes have been computed for each firm, the average abnormal trading volume (AAV) on day t is calculated as:

$$AAV_i = \frac{1}{N} \sum_{i=1}^N AV_{it} - 1 \quad [7]$$

The cumulative average abnormal volume (CAAV) is obtained by adding average daily abnormal volumes across different time intervals (a, b), within the event window [-2,+2].