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REVISITING THE MERGER AND ACQUISITION PERFORMANCE OF EUROPEAN BANKS

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ABSTRACT

The study examines the value creation of Merger and Acquisition (M&A) deals in European Banking from 1990-2004. This is performed, first, by examining the stock price reaction of banks to the announcement of M&A deals and, second, by analysing the determinants of this reaction. The findings provide evidence of value creation in European banks as the shareholders of the targets have benefited from positive and (statistically) significant abnormal returns while those of the acquirers earn small negative but non-significant abnormal returns. In the case of the shareholders of the acquirers, domestic M&As and especially those between banks with shares listed on the stock market, seem to be more beneficial compared to cross-border ones or those when the target is unlisted. Shareholders of the targets earn in all cases positive abnormal returns. Finally, although the link between abnormal returns and fundamental characteristics of the banks is rather weak, it appears that the acquisition of smaller, less efficient banks generating more diversified income are more value creating, while acquisition of less efficient, liquid and characterised by higher credit risk banks is not a value creating option.

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1. Introduction

Over the last two decades, the European banking sector has witnessed significant structural changes that resulted in its consolidation through a large number of mergers and acquisitions (M&As) and increased cross-shareholdings.[1] The major factors contributing to these developments were technological advances, the globalisation of financial markets, enhanced supervision of credit systems, the creation of a single financial market in the European Union (EU) and the introduction of the euro. Also, in many countries, especially where smaller banks were active, the growth in M&As was attributed to banks' desire to increase in size in order to obtain gains in terms of market power and/or efficiency as competition in the single European market increased. This resulted in the dramatic drop in the number of credit institutions in the EU-15 from approximately 12,000 at the end of 1990 to just over 7,000 at the end of 2004, with the majority of M&As bring domestic deals.
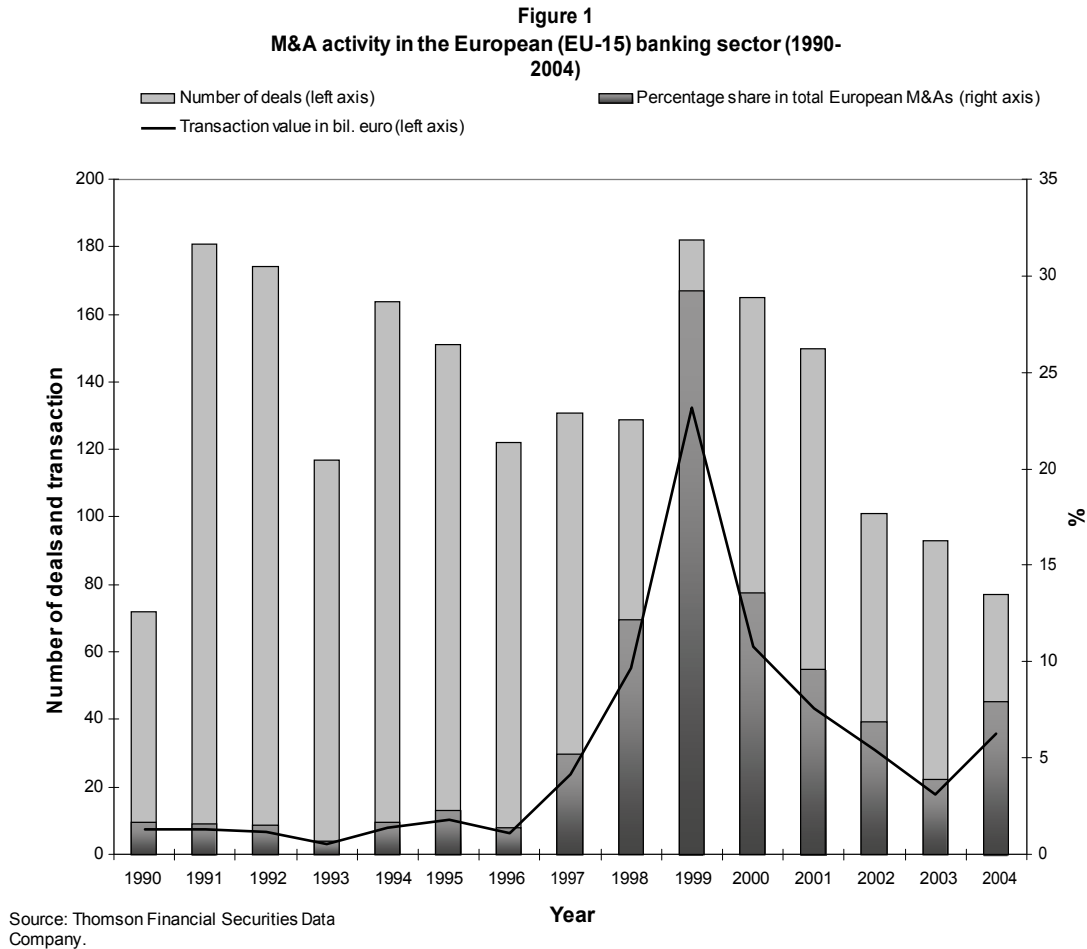
The importance of the banking sector for economic growth becomes evident from the number and value of banks' M&As to the total number of M&As and value of all sectors in Europe (see Figure 1). The peak in M&A activity was recorded in 1999, while the average number of M&As in the post-1999 period remained well above the respective one in the pre-1999 period. It is also worth noting that the value of bank M&As to total European M&As value climbed to a double digit figure. During the 1990s, a limited number of cross-border bank M&As occurred in EU countries since banks in these countries started to be more intensively interested in expanding outside national borders, especially into eastern European countries, only from 1998-99 onwards. It also worth noting that during the 1990s, the majority (about 80%) of bank M&A deals took place in four member states, namely Germany, Italy, France and Austria and involved small and very small banks, as these were keen to achieve adequate size to allow survival. The increased number of deals between larger banks evolved from the need for strategic repositioning and conglomeration.

Taking into account the aforementioned developments, the significant contribution of the banking sector in the credit process and in the economy and the

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[1] For an extended discussion on the developments of the European banking system, see European Central Bank (2000, 2004).

extended evidence from relevant studies analysing data from US banks, it is surprising that only a handful of studies have emerged to evaluate the stock market reaction to M&A announcements in the European banking sector (i.e. Campa and Hernando, 2006, Ismail and Davidson, 2005, Lepetit *et al.*, 2004, Altunbas and Ibanez, 2004, Beitel *et al.*, 2004, Beitel and Schiereck, 2001, Cybo-Ottone and Murgia, 2000).[2]

Figure 1
M&A activity in the European (EU-15) banking sector (1990-2004)

Source: Thomson Financial Securities Data Company.

The present study attempts to shed additional light on the value creation of M&A deals in Europe by examining the stock price reaction of banks (acquirers and targets) to

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[2] Another set of studies, small in number and utilising outdated data, has attempted to measure profitability and efficiency gains through balance sheet analysis (i.e. Focarelli *et al.*, 2002, Huizinga *et al.*, 2001, Vander Vennet, 1996, 2002, Molyneux *et al.*, 1996) providing mixed results.

the announcement of M&A deals in the period 1990-2004 using a differentiated sample and modified methodology and hypotheses compared to previous research.

First, the data employed focuses exclusively on deals between banks where the acquirer is a bank registered in an EU-15 country and the target is either a bank located in EU-15 or in an emerging eastern European country. **Second**, in order to analyse whether a stock market facilitates the efficient dissemination of information, the study explores the value creation of the deals not only when banks involved in an M&A deal have shares listed on a stock market, the usual approach in the literature, but also when a deal involves an unlisted bank. In this case of course only the share price reaction of the listed bank is estimated. **Third**, besides the typical event study methodology, abnormal returns were also estimated using a GARCH framework in order to capture the possible effects from the heteroscedastic behaviour of share prices. In addition, a series of tests were employed to estimate the statistical significance of abnormal returns. **Fourth**, the present paper provides further evidence on the domestic versus cross-border deals controversy. **Last**, but not least, we analyse the determinants of abnormal returns, an issue overlooked in previous research.

The main findings of the study are as follows: **First**, it provides evidence of value creation in the European banking sector as the shareholders of the targets benefited from by positive and statistically significant abnormal returns while those of the acquirers earn small negative but statistically non-significant abnormal returns. **Second**, in the case of the shareholders of the acquirers, domestic M&As and especially those between banks with shares listed on the stock market, seem to be more beneficial compared to cross-border ones or those when the target is an unlisted bank. **Third**, shareholders of the targets earn in all cases positive abnormal returns. **Fourth**, although the link between abnormal returns and fundamental characteristics of the banks is rather weak, it appears that the acquisition of smaller, less efficient banks generating more diversified income are more value creating, while acquisition of less efficient, liquid and characterised by higher credit risk banks is not a value creating option.

The study is structured as follows: the following section reviews the theoretical arguments behind the emergence of M&As together with the respective empirical evidence recorded on stock market reaction to M&A announcements. Section 3 deals

with the sample and the methodology and section 4 presents the empirical findings. Finally, section 5 concludes.

2. M&As and stock price reaction: theory and literature

2.1 The rationale, advantages and risks of M&As

Several arguments surround the advantages (motives) and risks of M&A deals and a useful summary of these is presented in Table 1.

Table 1

Motives and risks of domestic and cross-border M&As

	Domestic M&As	Cross-border M&As
Motives and rationalisation	- Economies of scale (cutting distribution networks and administrative functions rationalisation including information technology and risk management - Economies of scope - Size	- Diversification - Revenue efficiency - Economies of scale and scope - Size
Risks	- Operating (integrating risk management, customer and account systems and internal control procedures) - Cultural - Reputation - Strategic	- Operating (increased compared to domestic cases because of cultural differences) - Accounting, reporting, regulation issues - Foreign exchange risk (when applicable) - Reputation - Strategic

Economies of scale is the main argument behind M&As. This implies that banks proceed with M&As to reduce operating cost by cutting down branch networks and staff overheads and also by integrating information technology and risk management systems. On top of that, increased competition generates an incentive for banks to attain the appropriate size in order to take advantage of the market power and the larger capital base. Also, *size* may act as a defensive mechanism for banks wishing to withstand

external pressures arising from larger banks that may want to expand through acquisitions. *Economies of scope* is another rationale for M&A deals involving banks. Such economies are better exploited when a bank combines its business with another financial company in order to achieve complementarities and benefits from the cross-selling of products from existing distribution networks.

Banks may also want to expand in cross-border activities in order to gain access to a *larger client base* and also to *diversify* their sources of income. This type of expansion does not create direct benefits from economies of scale as it does not necessarily involve the overlapping of operations and services; however, it may create cost and *revenue efficiencies* by exploiting the know-how transfer from the acquiring to the acquired bank that in most cases is smaller in size and less sophisticated.

Of course, the benefits do not come without some cost due to the risks involved in these deals. *Operating risk* may be present due to the fact that it is not always easy to integrate technical systems, personnel culture and remuneration practices that could result in turf battles that in turn lead to the loss of key personnel and/or clients. Risks are increased for cross-border deals compared to domestic ones, as in this case *cultural differences* are intensified while differences in general practices, accounting and reporting issues and regulation, the foreign clients' perception of the deal and the foreign exchange risk, when applicable, provide additional obstacles. Finally, other significant risk factors are the *reputation risk* that is caused when a potential failure of the acquired institution would cause the reputation of the acquirer to deteriorate and the *strategic risk* that is related to misjudgement on the part of the management of the acquirer regarding the scope of the deal or the quality of the target.

2.2 Bank M&As and stock price reaction: theoretical arguments

The ultimate target for the management of any company, banks included, is the maximisation of shareholders value that for companies having shares listed in a stock market is reflected in their stock price. Any announcement of an intended M&A between banks attracts the interest of the investment community and the banks' shareholders as it gives them an opportunity to check the validity of the following two hypotheses:

"The information hypothesis", according to which the management team of the acquiring bank wants to proceed with a prospective deal because it may be aware that the value of the target bank is underestimated.

"The inefficient management hypothesis", according to which the target bank is obliged either to improve the operation of the bank in order to make it more efficient and thereby possibly prevent its takeover, or to hand over its management to a new more capable management team.

However, an intended bank M&A does not necessarily imply that the management aims to maximise shareholders wealth. If the utility function of the management of the acquiring bank is increasing proportionately to the scale of the bank, it is possible that the management in question will proceed with the M&A simply to derive the greatest possible personal benefit without taking into account the total cost involved in acquiring the target bank, which may be far higher than the value of the target bank itself. A similar case arises when the management of the acquiring bank overestimates its own ability to identify undervalued target banks, thus eventually paying a relatively high price ("hubris hypothesis", see Roll, 1986).

Taking into account the above arguments, the announcement of an intended M&A is expected to cause the following changes to take place in:

(a) Acquiring banks' shares:

A positive reaction when the M&A involves banks which provide similar services and/or are active in the same market. A negative reaction when it is perceived that the M&A serves only the personal interests of the management of the acquiring bank rather than the interests of the shareholders. A negative reaction may also be more related to a cross-border expansion or to a deal that involves a less-well known bank (usually an unlisted one) as investors generally face information asymmetries.

(b)Target banks' shares:

A positive reaction when either investors feel that the target bank's share price is undervalued or that the management of the target bank is inefficient and that, therefore, the acquisition will result in efforts to improve the operation and organisational structure of the bank, which will in turn lead to improved performance.

Capital market based research is looking into how the stock market reacts to announcements of M&As considering that this reaction is a major indication of how much the M&A is expected to affect the overall efficiency of the banks involved. In other words, this strand of literature attempts to analyse whether the announcement of an intended M&A creates positive or negative abnormal returns for the share prices of the banks involved in the M&A.

2.3 An overview of the literature

Empirical research into the impact of the announcement of a bank M&A on stock prices has concentrated mainly on bank M&As in the US, while it is relatively limited as far as the European banking system is concerned although there is a growing research interest in this direction over the past few years. The general conclusion drawn is that positive abnormal returns are observed in the case of the target banks' shares, while the results for acquiring banks are mixed, even though there is a tendency for abnormal returns to be negative or statistically insignificant in many cases.

Also, looking at the overall wealth of both the acquirer and the target, despite the benefits which theoretically should arise from an M&A and the partial transfer, as observed by several researchers, of wealth from the shareholders of the acquiring bank to the shareholders of the target bank, it appears that, in total, stock returns in the US are not affected by the announcement of an M&A, as acquiring banks show a loss on average which offsets the profits of target banks' shares. By contrast, in the EU, abnormal returns are mainly observed in the case of target banks and, to a lesser extent, in the case of acquiring banks.

In more detail, the empirical results presented in international literature may be summarised as follows:

(a) Acquiring banks

In the studies based on *daily data*, the results show that, following M&A announcements in **US**, stock prices of acquiring banks show positive but low abnormal returns before the announcement for a period of ten days or less (see Pettway and Trifts, 1985, James and Wier, 1987, Bertin *et al.*, 1989). By contrast, in another case, abnormal

returns appear to be negative for a period of four days before the announcement (see Houston and Ryngaert, 1994).[3]

In the studies based on *weekly data*, negative abnormal returns were observed for a period of 4 to 20 weeks after the announcement date (see Wall and Gup, 1989, Trifts and Scanlon, 1987), while in studies carried out using *monthly data*, negative abnormal returns were noted for a period of up to 36 months following the announcement date (see Madura and Wiant, 1994). In these cases, i.e. in cases where the abnormal returns continue for a relatively long period following announcement date, a possible cause is the inefficient operation of the stock market, or the fact that investors gradually change their expectations because the M&As appear to have brought about fewer benefits than had initially been discounted at the announcement date (see Piloff and Santomero, 1998).

The results are also contradictory in cases where the abnormal returns cover both the period before and after the announcement date. Specifically, in some studies a positive abnormal return is observed on the announcement date and on both the day before or the day after (see Desai and Stover, 1985, Cornett and De, 1991),[4] while other studies report negative abnormal returns for a period of one day before the announcement to one day after the announcement (see Kaen and Tehranian, 1989) and for a period of five days before and after the announcement date (see Baradwaj *et al.*, 1990, 1992). Finally, on another occasion, abnormal returns varied from positive to negative depending on the period when the analysis was carried out (see Dubofsky and Frazer, 1989).

Looking at evidence based on M&As in **Europe**, the first attempt by Cybo-Ottone and Murgia (2000) resulted in contradictory results in comparison to US studies as in some cases they reported positive abnormal returns which lasted for a period of 20 days before until 20 days after the announcement date. The results of Bietel and Schiereck (2001) and Ismail and Davidson (2004) are also in line with the findings of Cybo-Ottone and Murgia (2000), with the latter study presenting larger differentiation in terms of the value of the abnormal return. Finally, Campa and Hernando (2006) found virtually zero

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[3] Abnormal returns appearing before the announcement date may be related to insider trading or rumours leaking out before the deal are publicly announced.

[4] Cornett and De (1991), however, observe that the positive abnormal return for acquiring banks became gradually negative for a period of up to 15 days from the announcement date.

abnormal returns for the acquiring banks for the period surrounding the announcement date.

(b) Target banks

In the **US**, most studies find that the stock market reaction to M&A announcements was positive for target banks' shares for a period of 15 days before and after the announcement date (see Hannan and Wolken, 1989, Cornett and De, 1991). Also, the cumulative average abnormal returns following the announcement date remain positive for a period of up to 15 days following the announcement date, despite the occurrence of some negative abnormal returns in the same period, mainly due to the systematic appearance of positive abnormal returns up to the announcement date. In another case, positive abnormal returns are only noted during the four days preceding the announcement (see Houston and Ryngaert, 1994).

In studies which utilise *weekly data*, positive abnormal returns extend for a period beginning 40 weeks prior to the announcement date and continuing for 30 weeks after this date (see Trifts and Scanlon, 1987, Neely, 1987, De Cossio *et al.*, 1988, and Hawawini and Swary, 1990). Trifts and Scanlon (1987) in particular observed that acquiring banks presented positive cumulative abnormal returns for the period beginning 40 weeks before the announcement date and continuing up to 20 weeks after the date. However, for the separate 20-week period following the announcement date, the results were statistically insignificant. Moreover, in instances where abnormal returns are pinpointed for shares of both the acquiring and the target banks, the latter appear to benefit more than the former (see Zhang, 1995, Becher, 2000).

Studies based on data from M&As in **Europe** provide similar results to those reported for US data. However, there are observed significant quantitatively differences between the studies that analyse European M&As, mainly due to the period under examination or the number of firms that were included in the sample used. The first studies (Cybo-Ottone and Murgia, 2000, Bietel and Schiereck, 2001) report relatively higher abnormal returns, closer to those observed in US studies, while the latest studies (Ismail and Davidson, 2004, Campa and Hernando, 2006) present more conservative results, still positive and statistically significant though, with the difference attributed to the different structure of the utilised samples.

Finally, there is limited and inconclusive evidence on the benefits of domestic versus cross-border expansion with Campa and Hernando (2006), Lepetit *et al.* (2004), Beitel and Schiereck (2001) and Cybo-Ottone and Murgia (2000) presenting results indicating that domestic deals are more beneficial, whilst Ismail and Davidson (2004) reach, in some cases, the opposite conclusion.

3. Data and methodology

3.1 Data sample

The prime source of the bank M&As transactions examined in the present study is the "Thomson Financial Securities Data Company –Mergers and Acquisitions database", while information related to share prices and balance-sheet data was collected from Bloomberg L.P.

The selected sample includes all finalised (completed)[5] M&A transactions announced between 1990 and 2004 when the acquirer was a bank registered in any of the EU-15 countries and the target was a bank registered either in a EU-15 country or in an Eastern European country. In addition, banks included in the sample were not involved in more than one deal during the year under examination in order to isolate the information content of specific deals. As for share prices the norm was followed utilising daily prices. Specifically, for each deal, we required that the shares of at least one of the two banks participating in the deal to be listed in on organised exchange for at least one year (252 trading days) prior to announcement date and for at least 20 trading days following the announcement. Additionally, for the same length of period, prices of the composite stock market indices for each country in which the involved banks are domiciled were collected. Regarding balance-sheet data, we required complete information on net interest income, revenues, costs, provisions, profits, loans, deposits and total assets, as this information was vital for the construction of variables that are used in the second part of the study in an attempt to explain the determinants of share price reaction to the M&A announcements. Table 2 reports a summary report of the identified transactions.

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[5] The database includes all types of deals, including pending and withdrawn ones which are excluded in the current analysis.

Table 2

Sample distribution of European banks M&As deal announcements

No of Acquirers		No of Targets			
		Listed		Non-listed	
		Domestic	Cross-border	Domestic	Cross-border
Listed	145	34	14	42	55
Non-listed	25	18	5	-	-

Source: Thomson Financial Securities Data Company.

The sample used in this study differs from those of other studies examining the European market (e.g. Cybo-Ottone and Murgia, 2000, Beitel and Schiereck, 2001, Beitel *et al*., 2004, Lepetit *et al*., 2004, Ismail and Davidson, 2005, Campa and Hernando, 2006) in that: a) it spans a longer period (1990-2004); b) it focuses only on banking deals within EU-15 and Eastern Europe, in contrast to other studies that utilised a sample included companies from the financial sector in general; c) it does not restrict the sample requiring both the acquiring and the target bank having their shares listed on an organised stock exchange and therefore conclusions can be reached regarding the potential different reaction of the market to deals involving banks not listed on an exchange (i.e. due to information asymmetries); and d) it utilises balance-sheet data, an approach followed only by Bietel *et al*. (2004) and to some extend by Campa and Hernando (2006).

The initial sample collected comprised nearly 2,800 M&A deals. However, the criteria that were subsequently imposed restricted the final number of examined deals. The major requirement was that at least one of the banks involved in an M&A deal was listed on an organised exchange. This restricted the initial sample to 145 acquirers having their shares listed on an organised exchange and 25 which did not, with the respective numbers for the targets being 71 and 97. The number of domestic deals outperformed cross-border ones, with the majority of the latter involving non-listed banks.

3.2 Methodology

3.2.1 Event study

As already mentioned, the aim of the present study is to analyse the shareholders' value creation of bank M&A deals. For this reason, a standard "event study" methodology is adopted, a brief analysis of which follows. A key supposition underlying this method is the hypothesis that stock market prices fully and immediately incorporate all available information (market efficiency hypothesis). As a result, the announcement of an event such as an M&A deal leads to a rapid adjustment of the stock price connected with this event. In order to assess the significance of this price adjustment, an asset pricing model is used. Utilising such a model, as the market model in our case, which is the most commonly used one in the relevant literature, the linear relationship between the expected return of a share and the market portfolio may be given by equation (1):

$$R_{it} = a_i + b_i \, R_{mt} + e_{it} \, , \tag{1}$$

where: R_{it} is the expected return[6] of share i at time (day) t, R_{mt} is the return of the market portfolio m at time (day) t, a_i, b_i are the coefficients of the model, e_{it} is a statistical error term having an expected value $E(e_{it}) = 0$, constant variance $Var(e_{it}) = \sigma^2_{ei}$ and $E(e_{it}, e_{i,t-j}) = 0$, for every $i \neq j$.

The econometric estimation of the a_i and b_i coefficients in equation (1) and, by extension, of the expected returns of share i will be carried out using the Ordinary Least Squares (OLS) method for the period between 252 and 21 trading days before the announcement date. In addition to OLS estimation, equation (1) was also estimated by the use of a GARCH-type model in order to capture a well-known stylised fact that stock returns are characterised by time-varying volatility and volatility clustering effects (see for example Bollerslev, 1986, Akgiray, 1989). Specifically, an asymmetric GARCH-type model was adopted based on the well documented empirical finding that volatility is more sensitive to negative shocks compared to positive ones (see for example Nelson, 1991).

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[6] All returns in this study are calculated as the difference of natural logarithms of respective share prices.

The estimated coefficients $\hat{a}_i$ and $\hat{b}_i$ are then replaced in equation (1) in order to calculate the expected return $\hat{R}_{it}$ for each share i. Abnormal returns for each share i (ARi) are derived using equation (2):

$$AR_{it} = R_{it} - \hat{R}_{it} \, , \tag{2}$$

In order to draw inferences regarding the specific event, calculated abnormal returns must be first aggregated as shown in equation (3):

$$\overline{AR_t} = \frac{1}{N}\sum_{j=1}^{N} AR_{it} \, , \tag{3}$$

where: N is the number of banks under examination.

Whilst calculating abnormal returns provides an indication of the impact of the event, this indication refers only to individual time points. To investigate the ongoing impact of an event on share prices, average abnormal returns must be aggregated through time in accordance with equation (4):

$$CAR_{[t1, t2]} = \sum_{t=t1}^{t2} \overline{AR_t} \, , \tag{4}^{7}$$

where: $CAR_{[t1, t2]}$ is the cumulative abnormal return for the period $[t_1, t_2]$.

In the literature, various calculation periods of the cumulative abnormal returns are employed. The present study, in addition to the examination of the announcement date (t_0) reaction, utilises the most commonly used event window ranging from 20 days before to 20 days after the announcement date, i.e. [-20, +20]. Three intermediate time intervals [-20, 0], [-10, 0], and [-1, +1] are also used to validate the results.

Equations (1) to (4) are separately estimated for acquirers and targets and for different classifications within these two categories (i.e. national versus cross-border deals). A combined analysis, examining the sample as a whole, was not adopted as, in contrast to other relevant studies, we chose to include in the sample banks having shares not-listed on any organised stock exchange and therefore there were cases when a listed acquirer (target) made a deal with a non-listed target (acquirer) and consequently the focus was on the individual reaction of acquirers and targets.

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[7] Equivalently, one can calculate CARs by share and aggregate through time.

The statistical significance for both the abnormal and cumulative abnormal return can be assessed following a number of methods (see Campbell *et al*., 1987) with the most typical one being a traditional t-test.[8] However, the main limitation of most tests applied in event studies, including the traditional t-test, is the assumption that the "event" affects only the mean return, if any. Therefore, in case the event affects also the variance of returns around the event date, the use of non-event period data for the estimation of the variance of abnormal returns, a necessary calculation for statistical inference, will result to an often rejection of the null hypothesis that there is no significant reaction. In order to alleviate this problem, Boehmer *et al*. (1991) suggest that the variance of average abnormal returns is estimated from the cross-section of abnormal returns of any particular date. In more detail, a standardised CAR (SCAR) can be written as:

$$SCAR_{[t1, t2]} = \frac{CAR_{[t1, t2]}}{\hat{\sigma}_{it, [t1, t2]}}, \tag{5}$$

where: $\hat{\sigma}_{it}$ is estimated by the market model as $(t_2-t_1+1)\hat{\sigma}^2_{ei}$.

Boehmer *et al*. (1991), hereinafter BMP, propose the following test:

$$BMP = \frac{SCAR_{[t1, t2]}}{\frac{1}{N^2}\sum_{i=1}^{N}\left(SCAR_{i[t1, t2]} - \overline{SCAR_{[t1, t2]}}\right)^2}, \tag{6}$$

In addition to the BMP test, in order to verify our results, the non-parametric test of Corrado (1989) was also employed. This test has the advantage that it does not take into account the abnormal returns' distribution since, by using ranks, it neutralises the statistical effect (such as outliers, skewness etc.) of abnormal returns. To implement the test, each bank's abnormal return for the whole period of the study (estimation and event period) is assigned a rank, starting with the rank of one for the lowest abnormal return. Then, the ranks in the event period for each firm are compared with the expected average rank under the null hypothesis of no abnormal returns. Assuming that K_{it} is the rank for

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[8] The traditional t-test assumes that the distribution of $\hat{CAR}$ is normal with mean μ and variance σ^2 and

therefore the test is derived as $t_{[t1, t2)} = CAR_{[t1, t2]} \Big/ \left(\frac{1}{N^2}\sum_{i=1}^{N}\sigma^2_i\right)$

bank i at time t and T is the number of observations for the estimation and event period, the average expected rank for bank i is:

$$\overline{K_i} = 0.5 + T_i/2 , \qquad (7)$$

Using (7), the Corrado (C) test for event date 0 is specified as follows:

$$C = \frac{\frac{1}{N}\sum_{i=1}^{N}(K_{io} - \overline{K_i})}{\sqrt{\frac{1}{T}\sum_{t=1}^{T}\frac{1}{N^2}\sum_{t=1}^{N}(K_{it} - \overline{K_i})^2}} , \qquad (8)$$

For multi-week periods (L), the test becomes:

$$C = \frac{\sum_{l=1}^{L}\frac{1}{N}\sum_{i=1}^{N}(K_{il} - \overline{K_i})}{\sqrt{\frac{1}{T}\sum_{t=1}^{T}\frac{1}{N^2}\sum_{t=1}^{N}(K_{it} - \overline{K_i})^2}}\frac{1}{\sqrt{L}} , \qquad (9)$$

3.2.2 Analysing the determinants of abnormal returns

As already mentioned, the handful of studies dealing with M&A announcements in the European banking industry are mainly concerned with the stock price reaction surrounding the announcement date, while they provide limited evidence regarding the factors that may explain this reaction. The present study builds on the estimated abnormal returns and attempts to identify the factors that drive the results. For this reason several factors, which are analysed in Table 3, are considered and their choice aims to provide evidence on the effect of the "general characteristics of the deals", as well as of the "fundamental characteristics" of the banks involved. More specifically, regarding the former:

¾ "Target": aims to differentiate the reaction between acquirers and targets.

¾ "Dom": proxies the geographic focus of the deal as domestic deals provide better opportunities for synergy benefits while cross-border expansion is expected to provide income and risk diversification benefits.

¾ "Listed": attempts to provide evidence regarding the mechanism of the stock market to facilitate the efficient process and dissemination of available information as listed banks are expected to provide more quality disclosures.

¾ "Cult": analyses the geographic focus in an attempt to examine whether the cultural difference between the countries in which an acquirer and a target bank are domiciled may explain the abnormal returns. One hypothesis is that a greater cultural difference[9] between two countries increases acquisitions costs, negatively affecting an M&A deal. However, an alternative hypothesis suggests that the greater the cultural difference the greater the diversification benefits. For example, Charkrabari *et al.* (2005) studying the impact of the culture on the long-term performance of M&As (including also M&As from sectors other than the financial one) reported that the greater the cultural distance between the two firms, the better the combined firm performs in the long run.

Regarding the fundamental characteristics (balance-sheet information) of banks:

¾ "ROE"(Return on Equity): is a major indicator of banks performance. More profitable banks can withstand shocks in the economy, while in M&A deals they can facilitate the transfer of resources from the more profitable bank to the less profitable one with the overall effect on the combined entity being difficult to estimate.

¾ "Size": is also an important variable as the merger between two large banks may entail more benefits in terms of scale economies (cost reduction through synergy) but involves a far more complex procedure compared to a deal between a large and a small bank.

¾ "Liq": liquidity is also considered as an important variable in banking as it indicates the ability of the banks to further expand their business while at the same time having a buffer on which they can rely in adverse market conditions. A

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[9] The cultural differences are based on the proposed methodology found in Hofstede's (1980) work, a summary of which is reported in the Appendix.

deal between a bank having good liquidity and one that does not may provide more distribution channels for the more liquid bank to expand its business by utilising those of the less liquid bank that is not in a position to exploit.

¾ "Prov": proxies the credit risk providing an indication of how aggressive a bank is in its expansion and/or how advanced its risk management systems are. In either case, a deal may facilitate the transfer of know-how providing also some, minor maybe, diversification benefits.

¾ "Eff": is an efficient measure and proxies how effectively a bank utilises its expenses in order to generate income. An efficient bank can transfer its superior skills to another bank through a deal in an attempt for the overall entity to realise efficiency potentials.

¾ "Nii-Ti" (the share of interest related income to total income): provides evidence on how diversified are the sources of income. A deal involving two banks having a high ratio may result in wealth creation due to the effect of product focus. However, there is also the argument that an M&A deal may be more valuable when it provides better diversification in the income sources as this makes banks less vulnerable to external shocks.

¾ "Value": examines whether the value of the deal may affect the investors' response in case they consider that the acquirer pays too much or too little given the value of the target.

¾ "Year": proxies the market conditions that prevail in particular years in which the M&As took place since it is a fact that in bull markets M&A deals increase creating the incentive to check whether market conditions affect the way investors react to M&As announcements.

Table 3
Description of bank-specific variables

Variables	Description
Target	A binary variable taking the value of 1 if the bank is a target and the value of 0 otherwise.
Dom	A binary variable taking the value of 1 if the M&A deal is domestic and the value of 0 otherwise.
Listed	A binary variable taking the value of 1 if the bank lists its shares in an organised stock exchange and the value of 0 otherwise.
Cult	The culture index as described by Hofstede (1980) and is presented in the Appendix.
ROE	Return of Equity of the bank under consideration.
Size	The size of the bank under considerations as measured by the natural logarithm of its total assets.
Liq	A liquidity measure of the bank under consideration measured as the loans to deposits ratio.
Prov	A credit risk proxy of the bank under consideration measured as the provisions to loans ratio.
Eff	An efficiency proxy of the bank under consideration measured by the operating expenses to operating income ratio.
Nii-Ti	An income diversification proxy of the bank under consideration measured by the Net Interest Margin to Total Income ratio.
Value	The value of the deal measured in billions of US dollars.
Year	A binary variable taking the value of 1 if an M&A announced in a year with the stock market reported a positive return and 0 otherwise.

Two types of models were utilised, a typical OLS regression and a Probit-type regression. The purpose of using a Probit model was twofold. First, to verify the

inferences drawn from OLS estimations, and second to provide additional evidence employing a set of binary, dependent and independent, variables that attempt to capture a size effect by dividing the variables according to their cross-section median. Equations (10) and (11) below will be estimated by the OLS and the Probit methods respectively:

$$CAR_{[t1, t2]} = a_0 + \sum_{i=1}^{n} a_i X_i + e_t , \tag{10}$$

where: $CAR[t_1, t_2]$ is the cumulative abnormal return for the period $[t_1, t_2]$ as described in equation (4), X_i is the vector of n independent variables and e_t is the error term. Equation (10) will be estimated for the whole sample as well as separately for acquirers and targets.

$$Y_i = \beta_0 + \sum_{i=1}^{n} \beta_i Z_i + e_t , \tag{11}$$

where: $Y_i = 1$ if $CAR[t_1, t_2] \geq 0$

        $Y_i = 0$ if $CAR[t_1, t_2] < 0$

and, in comparison to equation (5), all Z_i variables are binary with the non-binary variables of Table 3 being also translated to binary ones by taking the value of 1 when the respective values are above their cross-section median and 0 otherwise.

Although equations (10) and (11) provide an indication of the potential explanation of cumulative abnormal returns for the total sample, in an attempt to shed additional lights to the factors that determine those returns, both equations will be re-estimated using an additional set of variables as for a matched sample of bidders and targets for which balance sheet data are jointly available. The new variables (Relroe, Relsize, Relliq, Relprov, Releff, Rel-Nii_Ti) representing the fundamental characteristics of the banks are simply the ratios of the acquirers divided by the ratios of the targets (using balance sheet data as described in Table 3).

4. Empirical results

4.1 M&A announcement and market reaction

Cumulative abnormal returns (CARs) for the [-20, +20] days window for both acquirers and targets as well as CAR's for different event windows are reported in Figure

2 and Table 4 respectively. Two striking features emerge. The first, is the downward bias in the results for both acquirers and targets under the OLS estimation in comparison to the GARCH one. The second, being consistent with the consensus in the literature is the clear differentiation between the returns achieved by the two groups of banks. In particular, shareholders of the acquirers do not seem to enjoy value creation as a negative reaction to the M&A announcement is observed. However, this negative reaction is short-lived and smaller in size compared to the literature and not statistically significant at any examined event window.

Figure 2
Cumulative abnormal returns for acquirers and targets
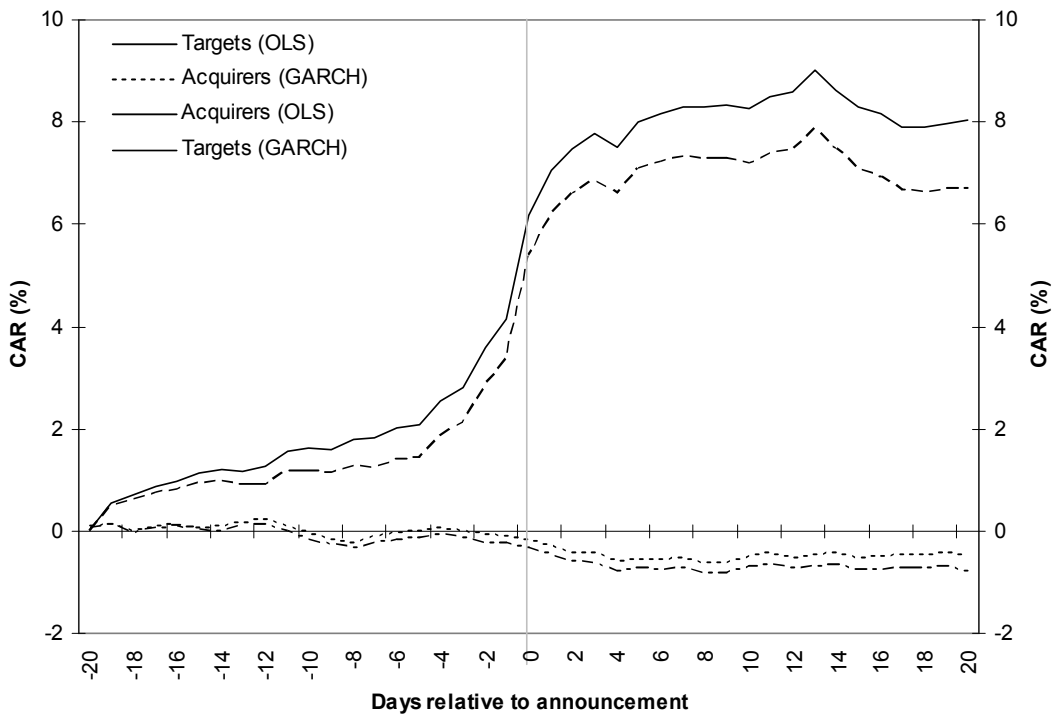
As reported in Table 4, the reaction for acquiring banks at event date $[0]$[10] is -0.08% and -0.07% under the OLS and GARCH estimation respectively. During the whole 41 days event period the negative reaction amounted to -0.79% and -0.51% respectively. These findings are in line with Cybo-Ottone and Murgia (2000) who also reported negative, but not statistically significant, abnormal returns for the acquiring banks. The findings also support those of Beitel and Schiereck (2001) and, partially, those of Ismail and Davidson (2005) who also found an insignificant albeit positive market reaction for acquirers in the European market. With respect to studies for US banks (e.g. Baradwaj *et al*., 1990, Cornett and Tehranian, 1992, Siems, 1996, Kane, 1999, DeLong, 1999) the present study reports, on average, higher abnormal returns for acquirers.

Table 4

Cumulative abnormal returns of Acquirers and Targets

at various intervals (total sample)

	Acquirers (N=145)				Targets (N=71)			
	CAR (%)		No of deals		CAR (%)		No of deals	
Event window	OLS	GARCH	With positive CAR	with negative CAR	OLS	GARCH	with positive CAR	with negative CAR
[-20; 0]	-0.33	-0.18	73	79	5.38[1,2]	6.18[1,2]	49	22
[-10; 0]	-0.33	-0.28	71	81	4.22[1,2]	4.61[1,2]	48	23
[-1; 1]	-0.23	-0.22	69	83	3.36[1,2]	3.47[1,2]	47	24
0	-0.08	-0.07	73	79	2.01[1,2]	2.03[1,2]	47	24
[-10; 10]	-0.70	-0.59	64	88	6.02[1,2]	6.69[1,2]	48	23
[-20; 20]	-0.79	-0.51	68	84	6.60[1,2]	8.03[1,2]	47	24

Note: 1, 2 denote significance at the 5% level of significance for the BMP and the Corrado tests respectively.

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[10] We note that in some cases the announcement may have taken place either before the market open, or during the operation of the market or after the market closed. Therefore, it is possible that the effect may not be fully captured by the abnormal return reported for the event date. This is why the different event windows reported in the results also include the [-1, +1] window.

In contrast to the aforementioned results, target banks' shareholders enjoy significant value creation as reported in Figure 2 and Table 4. The abnormal return at the event date amounts to 2.01% and 2.03% for the OLS and GARCH estimation respectively, further increased by more that 1% for the [-1, +1] window and jump to 8.03% for the [-20, +20] window under the GARCH estimation (6.60% under the OLS estimation). Also, the CARs are statistically significant at all event windows. These results are derived despite the fact that approximately one third of the CARs is negative, evidence also reported by Ismail and Davidson (2005). In addition, information concerning the deal appears to be gradually leaking into the market starting from a few days before the actual announcement takes place. This indicates either rumour dispersion concerning M&As or that inside information is exploited in carrying out transactions, a phenomenon which is also observed in other cases of M&As involving banks in the US and the EU.

In general, the results are in line with the majority of studies that report value creation for the shareholders of the targets, albeit lower in comparison to many of them, especially to those dealing with European banks (Cybo-Ottone and Murgia, 2000, Beitel and Schiereck, 2001, Ismail and Davidson, 2005) indicating that acquirers in Europe do not generally pay relatively high prices for target banks. A possible explanation for this is that the increasing competition observed in the European banking industry during the period under examination in the present study made acquiring banks more cautious during their expansion with their management priority focusing on cost rationalisation and the maintenance of present position and secondarily on expansion.

In order to shed more light on the results, different sub-samples were also analysed in an attempt to identify potential differences regarding the impact of geographic diversification[11] or the effect of being listed on a stock exchange. Also note that all results being discussed hereinafter concern abnormal returns estimated with the GARCH model since as evidenced above OLS estimations biases the results downwards.[12]

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[11] As the focus of the study is on banks, geographic diversification was the only dimension that could be examined. However, a proxy for product diversification is also broached following the econometric study in the second part of the results.

[12] All estimations were also carried out using OLS and the qualitative results do not differ.

Tables 5 and 6 report the results for "national versus cross-border deals" separately for the cases when the acquirer or the target bank is listed on a stock exchange or not. In general, qualitative differences are detected for the acquirers while for the targets, apart from the magnitude of CARs, no significant differences are detected.

Table 5

Cumulative abnormal returns of *acquirers* for different classifications of *targets*
(GARCH estimation)

Event window	Target listed (N=48)			Target not-listed (N=97)		
	CAR (%)		CAR difference	CAR (%)		CAR difference
	Domestic deals (N=34)	Cross-border deals (N=14)		Domestic deals (N=42)	Cross-border deals (N=55)	
	(1)	(2)	(3)=(2)-(1)	(1)	(2)	(3)=(2)-(1)
[-20; 0]	0.99[1]	-0.42	1.41	-0.89[1]	-0.15	0.74
[-10; 0]	0.77[1]	-0.35	1.13	-0.77	-0.41	0.36
[-1; 1]	0.59	-0.60*	1.19	-0.50	-0.27	0.23
0	0.31	-0.33	0.64	-0.26	-0.03	0.23
[-10; 10]	1.04[1]	-0.87	1.91	-1.47[1,2]	-0.65[1]	0.83
[-20; 20]	1.23[1,2]	-1.18[1,2]	2.41**	-1.60[1,2]	-0.32	1.27

Notes: 1, 2 denote significance at the 5% level of significance for the BMP and the Corrado tests respectively.
 * (**) denote significance at the 5% (10%) level of significance for the CAR difference (t-test).

More specifically, from Table 5, it is clear at all examined windows that, when the target is a listed bank, CARs for acquirers are positive for domestic deals and negative for cross-border ones and statistically significant in most cases. Examining the statistical significance of the differences between national and cross-border deals, however, we detect significant differences only for the [-20, +20] window. These results provide an indication that shareholders of acquirer banks do not exploit any benefits from cross-border expansion despite the theoretical advantage that such deals carry with respect to income and risk diversification. Alternatively, it may be difficult for investors

to assess the expected benefits from geographic diversification. Probably, cultural, legal, accounting and informational factors pose significant barriers despite the large steps towards integration that have been undertaken in the European environment. The results are in line with Cybo-Ottone and Murgia (2000), Beitel and Schiereck (2001) and Lepetit *et al.* (2004), but in some period windows differ with those reported by Ismail and Davidson (2005). The results are also in line with US studies in which intrastate M&As seem to be more value creating compared to interstate ones (see for example Houston and Ryngaert, 1984, DeLong, 1999).

However, a different conclusion compared to the one for the acquirers is reached when target banks are not listed on an organised stock exchange. In this case, both national and cross-border deals destroy value for the shareholders of acquiring banks with the CARs for domestic deals reaching -1.60% for the [-20, +20] window. These results indicate the importance of the stock exchange as a discipline and monitoring mechanism since the negative reaction to an M&A announcement involving a non-listed bank indicates concerns related to information asymmetries. Most importantly these concerns seem to be greater when the non-listed bank is located in the same country as the acquiring bank. This is a particularly interesting result requiring further empirical investigation especially considering that the present study is the first to examine such a distinction.

The conclusions reached in the case when the CARs of the targets are examined are completely the opposite. Looking at the results reported in Table 6, we notice a strong reaction at all examined period windows, without however identifying statistically significant differences between domestic versus cross-border deals for either listed or non-listed acquirers. These are particularly interesting results indicating significant value creation for the shareholders of the targets even for cross-border deals as shareholders probably assess the deal being positive in terms of transferring expertise from the acquirer to the target as in most cases the deal involves a larger and more sophisticated acquirer.

Table 6

Cumulative abnormal returns of *targets* for different classifications of *acquirers* (GARCH estimation)

Event window	Acquirer listed (N=48)			Acquirer not-listed (N=25)		
	CAR (%)		CAR difference	CAR (%)		CAR difference
	Domestic deals (N=34) (1)	Cross-border deals (N=14) (2)	(3)=(2)-(1)	Domestic deals (N=18) (1)	Cross-border deals (N=5) (2)	(3)=(2)-(1)
[-20; 0]	6.76[1,2]	4.94[1,2]	1.82	6.31[1,2]	6.20[1,2]	0.10
[-10; 0]	4.94[1,2]	4.28[1,2]	0.66	4.45[1,2]	5.17[1,2]	-0.72
[-1; 1]	4.69[1,2]	3.22[1,2]	1.47	2.60[1,2]	2.24[1,2]	0.36
0	2.31[1,2]	2.20[1,2]	0.11	1.94[1,2]	0.72	1.22
[-10; 10]	8.11[1,2]	4.80[1,2]	3.31	6.16[1,2]	7.75[1,2]	-1.60
[-20; 20]	9.95[1,2]	5.14[1,2]	4.81	8.02[1,2]	7.16[1,2]	0.86

Notes: 1, 2 denote significance at the 5% level of significance for the BMP and the Corrado tests respectively.
* (**) denote significance at the 5% (10%) level of significance for the CAR difference (t-test).

4.2 The determinants of value creation

4.2.1 Estimations based on OLS

The results presented in the previous section provide an interesting input for a more detailed analysis regarding the determinants of abnormal return, especially considering that only two attempts have so far been undertaken in the literature (Campa and Hernando, 2006, Beitel *et al*., 2003) to analyse the factors that explain the M&A success in the European banking sector. Also, in those two cases fundamentals are not strongly related to abnormal returns possibly indicating the difficulty of investors to assess the financial viability of the deal at the announcement date.

Equation (10) was initially estimated for the whole cross-section (the whole sample) with the dependent variable being the CAR$_{[-1, +1]}$. The CAR choice refers to a small period around the announcement date in order to exclude the impact of information leakages.[13] As explanatory (independent) variables, we used the variables presented in Table 3 and the results from the estimation of equation (10) are presented in Table 7.

Univariate models were estimated in order to identify the potential sole effect of each variable.[14] The results indicate that the binary variables have a positive effect on the CARs while the balance sheet data, with the exception of the Nii-Ti variable, report a negative effect. Looking at the significance of the coefficients though it appears that a statistically significant and positive effect on the CAR is identified for banks that are targets rather than acquirers or the deal is a domestic one. On the other hand, ROE and Size appear to have a significant negative effect on the CARs, a result indicating that deals between banks smaller in size or less profitable may be more beneficial. Also, it may provide an indication that larger and more profitable banks have more chances of creating value for their shareholders by acquiring smaller and less profitable banks as it will be easier to efficiently proceed with the necessary re-organisation needed. Also, although the variables Listed and Nii-Ti are not statistically significant at a level of significance of up to 10%,[15] they were identified as being considerably more important compared to the remaining variables. Therefore, there is some indication that a deal involving either a listed bank or a bank having a high Nii-Ti ratio, that is to say a bank that focuses on a relatively stable source of income, may add value to shareholders. Examining the significant variables using a multivariate model we observed that the Target variable clearly dominates, being virtually the only one that matters. Re-estimating the model excluding its effect, the results from the multivariate estimation support those from the univariate ones.

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[13] The CAR$_{[-20, +20]}$ was also used and the results did not present any qualitative differences.
[14] Note that all regression results were tested for autocorrelation, multicollinearity and heteroscedasicity to ensure that none of these conditions are violated.
[15] The p-values for these two variables approach 0.20.

Table 7
Factors explaining the abnormal returns for the [-1, +1] window
(OLS estimation)

c	Target	Dom	Listed	Cult	ROE	Size	Liq	Prov	Eff	Nii-Ti	Value	Year	R²	F
-0.217	3.683*												0.101	26.084*
0.131		1.469**											0.014	4.295**
0.477			1.066										0.006	2.252
0.056**				-0.012									0.005	1.173
2.110*					-0.103***								0.009	3.057***
5.987*						-0.453*							0.022	6.140*
1.001**							-0.042						0.001	0.46
0.982***								-0.006					0.000	0.100
1.046									-0.133				0.000	0.001
-1.143										3.801			0.005	2.193***
0.911**											0.004		0.000	0.150
0.633												0.485	0.000	0.416
0.094	3.387*	0.553			-0.003	-0.012							0.093	6.710
5.160**		1.083**			-0.008***	-0.352***							0.032	3.504**

Notes: * , **, *** denote significance at the 1%, 5% and 10% level of significance respectively.
c is the constant of the equation, Target is a binary variable taking the value of 1 if the bank is a target and the value of 0 otherwise, Dom is a binary variable taking the value of 1 if the M&A deal is a domestic one and the value of 0 otherwise, Listed is a binary variable taking the value of 1 if the bank lists its shares in an organised stock exchange and the value of 0 otherwise, Cult measures the cultural distance between the countries involved in the deal, ROE is the return of equity, Size is measured by the natural logarithm of total assets, Liq is the loans to deposits ratio, Prov is the provisions for loans losses to total loans ratio, Eff is the cost to income ratio, Nii_Ti is the contribution of interest related income to total income, Value is the value of the deal and YEAR is a binary variable that takes the value of 1 when the performance of the stock market was positive and the value of zero otherwise.

4.2.2 Estimation based on Probit method

Equation (11) was estimated using the Probit model. This will give us a further indication whether a probability of producing positive CARs is increasing when the bank's characteristics are classified above or below their cross-section median. The results reported in Table 8 verify the signs identified in Table 7 a fact that enhances the previous discussion. However, the statistical significance of the variables in the present case is much weaker and only the Target and Eff variables remained statistically significant reinforcing the already mentioned effect. This gives an indication that a market for corporate control exist in the European banking sector suggesting that the control of a badly managed bank will be transferred to a better managed one increasing the expectation for a turnaround story. In addition, the Eff variable suggests that a relatively more efficient bank that enters into an M&A deal decreases the probability of creating positive CARs. A potential explanation for this cannot be isolated from the one offered for the ROE variable above. That is to say, there is an indication that the shareholders of an efficient bank may be worried about the prospects of the deal.

4.2.3 Determinants of the share price reaction of acquirers and targets

Although the analysis presented above offers useful insights regarding the general determinants of the share price reaction to an M&A deal, it does not clearly differentiate the results between the two groups, acquirers and targets, and therefore the clear determinants for each group cannot be identified. Hence, we also explore the fundamentals of a matching sample of acquirers and targets in order to identify the determinants that may affect the share price reaction of each group. We note that data availability restricts the sample to listed banks only.

Table 8
Factors explaining the abnormal returns for the [-1, +1] window
(Probit estimation)

c	Target	Dom	Listed	Cult	ROE	Size	Liq	Prov	Eff	Nii-Ti	Value	Year	R^2	LR
-0.082	0.500*												0.024	7.486*
-0.025		0.176											0.003	1.086
0.030			0.095										0.001	0.316
0.139				-0.082									0.000	0.237
0.112					-0.078								0.000	0.216
0.225***						-0.304***							0.010	3.274
0.180							-0.213						0.005	1.115
-0.067								0.283***					0.009	2.831
0.2487**									-0.350**				0.014	3.421**
-0.0896										0.329**			0.012	3.815**
0.0223											0.102		0.001	1.369
												-0.006	0.000	0.139
0.232	0.517*					-0.072	-0.025	0.173	-0.454**	-0.028			0.055	17.086*
0.318						-0.219	-0.238	0.181	-0.327***	0.1119			0.036	11.283

Notes: *, **, *** denote significance at the 1%, 5% and 10% level of significance respectively.
Target is a binary variable taking the value of 1 if the bank is a target and the value of 0 otherwise, Dom is a binary variable taking the value of 1 if the M&A deal is a domestic one and the value of 0 otherwise, Listed is a binary variable taking the value of 1 if the bank lists its shares in an organised stock exchange and the value of 0 otherwise, Cult measures the cultural distance between the countries involved in the deal, ROE is a binary variable taking the value of 1 when the ROE of the bank is above the cross-section median and the value of zero otherwise, Size is a binary variable taking the value of 1 when the natural logarithms of total assets of the bank is above the cross-section median and the value of zero otherwise, Liq is a binary variable taking the value of 1 when the loans to deposits ratio of the bank is above the cross-section median and the value of zero otherwise, Prov is a binary variable taking the value of 1 when the provisions for loans losses to total loans ratio of the bank is above the cross-section median and the value of zero otherwise, Eff is a binary variable taking the value of 1 when the cost to income ratio of the bank is above the cross-section median and the value of zero otherwise, Nii_Ti is a binary variable taking the value of 1 when the contribution of interest related income to total income of the bank is above the cross-section median and the value of zero otherwise, Value is a binary variables taking the value of 1 when the value of the deal is above the cross-section median and the value of zero otherwise and Year is a binary variable taking the value of 1 when the performance of the stock market was positive and the value of zero otherwise. The R^2 is the McFadden R^2 and the LR is the likelihood ratio that measures the overall significance of the model.

A new set of variables is utilised that are simply derived by dividing the respective variables for acquirers by those of the targets. Basic descriptive statistics of the new variables are reported in Table 9 indicating that acquirers compared to targets are in general more profitable, larger in size, more liquid, have lower credit risk, are more efficient and their income sources are more diversified.

Table 9

Basic descriptive statistics for a matching sample of acquirers and targets

	Relroe	Relsize	Relliq	Relprov	Releff	Rel-Nii_Ti
Mean	2.41	1.28	1.16	0.82	0.88	0.85
Median	1.42	1.19	1.05	0.69	0.89	0.83
Std. Dev.	2.82	0.26	0.50	0.76	0.17	0.25
Obs	48	48	48	48	48	48

Notes: Relroe is the ratio of the ROE of the acquirers to the ROE of the targets, Relsize is the ratio of the natural logarithms of assets of the acquirers to the natural logarithm of assets of the targets, Relliq is the loans to deposits ratio of the acquirers divided by the respective ratio of the targets, Relprov is the provisions to total loans ratio of the acquirers divided by the respective ratio of the targets, Releff is the cost to income ratio of the acquirers divided by the respective ratio of the targets, Rel_Nii_Ti is the proportion of the interest-related income of the acquirers divided by the respective proportion of the targets.

Table 10 reports the results for both acquirers and targets. Again, both univariate and multivariate OLS regressions are applied as well as a multivariate Probit. The results suggest that fundamentals provide a weak explanation of the value creation of the M&A deals and mainly for targets. We note however that the statistical significance of the results may be affected by the small size of the sample, and therefore, without overlooking this limitation, we base the discussion on the signs of the coefficients, that is on the direction of the effect.

Looking at the acquirers first, we note that their shareholders may be better off when there is an M&A deal involving a less profitable target that is also smaller in size. However, when targets are characterised by low liquidity, higher credit risk and low efficiency, then the deal is less value creating for the shareholders of the acquirers as they probably are concerned not only about the overall cost of the deal when these factors are taken into account but also about the scope of the deal. By contrast, there are indications that deals with targets presenting lower income generation from interest related activities (earnings diversification) are more beneficial for acquirers.

Table 10

Factors explaining the abnormal returns of acquirers and targets for the [-1, +1] window

Panel A: Acquirers (OLS estimation)

c	Relroe	Relsize	Relliq	Relprov	Releff	Rel-Nii_Ti	R^2-adjusted	F (LR for probit)
-0.772**	0.114						0.061	1.78
-1.829		1.035					0.054	0.73
0.492			-0.851				0.065	1.85
-0.461				-0.042			0.012	0.91
0.023					-0.032**		0.043	3.36**
-0.615						0.132	0.001	0.45
1.094		1.207	-0.893	-0.038	-0.029***	0.201	0.052	1.11
(Probit estimation)								
-0.381	0.069	1.292***	-0.931**	-0.007	-0.021**	1.696**	0.213	15.25**

Panel B: Targets (OLS estimation)

c	Relroe	Relsize	Relliq	Relprov	Releff	Rel-Nii_Ti	R^2-adjusted	F (LR for probit)
3.889**	-0.063						0.025	0.18
-2.841		0.581					0.024	0.21
3.779			0.017				0.028	0.01
3.732**				0.021			0.025	0.01
-1.081					0.548		0.022	0.53
8.577						-0.6420	0.027	0.98
-7.179		0.391	0.018	0.828	0.174	-0.7331	0.023	0.78
(Probit estimation)								
-0.006	-0.014	0.423	0.048	0.019	0.467	-0.225	0.06	0.49

Notes: *, **, *** denote significance at the 1%, 5% and 10% level of significance respectively. c is the constant of the equation, Relroe is the ratio of the ROE of the acquirers to the ROE of the targets, Relsize is the ratio of the natural logarithms of assets of the acquirers to the natural logarithm of assets of the targets, Relliq is the loans to deposits ratio of the acquirers divided by the respective ratio of the targets, Relprov is the provisions to total loans ratio of the acquirers divided by the respective ratio of the targets, Releff is the cost to income ratio of the acquirers divided by the respective ratio of the targets, Rel_Nii_Ti is the proportion of the interest-related income of the acquirers divided by the respective proportion of the targets. For the probit estimation all variables take the value of 1 when their values are above the cross-section median and the value of zero otherwise. R^2 are adjusted R^2 for OLS estimations and McFadden R^2 for the probit estimations, F and LR are the F and the likelihood ratio statistics for the OLS and the probit estimations respectively.

The results for the targets reinforce the previous findings that being a target is a good enough reason for their shareholders, as fundamentals, apart from the signs, do not indicate a statistically significant effect on abnormal returns. In general though, looking at the signs of the coefficients, the results indicate that shareholders of the targets may be better off when the deal involves a larger, more liquid and lower credit risk acquirer that also superior efficiency ratios.

The results concerning the relative performance (Relroe) and the relative focus on income generation (Rel-Nii_Ti) are puzzling as their negative signs suggest that abnormal returns for the targets are negatively affected when the acquirers are more profitable and less diversified. This may reflect the concern of shareholders that the restructuring plan required to improve the profitability of the target may affect, at least in the short-run, the price of the target's share. Regarding the Rel-Nii_Ti case it may reflect the concern that the business of the targets may lose the advantage offered by their specialisation in market segments in which income is generated by non-interest related activities. On the other hand, the negative sign may indicate that the fact the acquirers and the targets do not focus on the same line of business may reduce the economies of scale and hence the potential for cost savings.

Probit estimation supports the findings although again the weak statistical significance reduces the strength of inferences requiring further investigation in this area of research. This conclusion is strengthened in the face of the weak results of previous attempts (Beitel *et al*., 2003, Lepetit *et al*., 2004).

5. Conclusions

In this study, by utilising a standard event study type analysis for a sample of European banks and spanning a period of 15 years, the impact of announced M&As on banks' stock prices was examined. According to the results, overall, an M&A announcement does not seem to create value for the shareholders of acquirers as opposed to the positive and significant value creation for the shareholders of the targets.

Another important finding is that cross-border expansion is not value creating for acquirers suggesting that despite the continuous efforts of all relevant authorities to create a more integrated market for financial services in Europe, shareholders prefer their banks

to be active only in domestic markets. This evidence shows the concern of investors for information transparency in cross-border deals as well as their belief that existing differences in cultural, legal or accounting factors between countries will count against the success of growth potential and cost reduction that is expected from a cross-border deal.

On the other hand, shareholders of the targets benefit from both domestic and cross-border deals. An additional interesting finding is the negative abnormal returns observed for acquirers when the shares of the target are not listed in an organised stock exchange indicating the concern regarding information asymmetries that are generally reduced by the disciplinary and monitoring function of the stock market. Again, shareholders of the targets enjoy value creation irrespectively of the listed status or otherwise of the acquirer.

Attempting to explain the observed abnormal returns based on major balance sheet items of the banks we reached the conclusion that shareholders of acquirers seem to benefit from deals with smaller and less profitable banks generating a significant portion of their income from non-interest related activities and preferably having their shares listed on a stock market. However, they are also concerned when the target is characterised by low liquidity and efficiency and heightened credit risk. In contrast to these, shareholders of the targets enjoy positive abnormal return regardless of the fundamentals of the deal, although there is a weak indication that deals with larger, more liquid, banks with lower credit risk and being more efficient focusing on interest-related activities are preferable.

APPENDIX

Hofstede's (1980) cultural dimensions are described on his Web site, http://www.geerthofstede.com

The cultural distance index employed in the present study is a weighted index based on the following four factors:

1) *The Power Distance Index* that focuses on the degree of equality, or inequality, between people in the country's society. A High Power Distance ranking indicates that inequalities of power and wealth have been allowed to grow within the society. These societies are more likely to follow a caste system that does not allow significant upward mobility of its citizens. A Low Power Distance ranking indicates the society de-emphasizes the differences between citizen's power and wealth. In these societies equality and opportunity for everyone is stressed.

2) *Individualism* that focuses on the degree the society reinforces individual or collective achievement and interpersonal relationships. A High Individualism ranking indicates that individuality and individual rights are paramount within the society. Individuals in these societies may tend to form a larger number of looser relationships. A Low Individualism ranking typifies societies of a more collectivist nature with close ties between individuals. These cultures reinforce extended families and collectives where everyone takes responsibility for fellow members of their group.

3) *Masculinity* that focuses on the degree the society reinforces, or does not reinforce,

the traditional masculine work role model of male achievement, control, and power. A

High Masculinity ranking indicates the country experiences a high degree of gender differentiation. In these cultures, males dominate a significant portion of the society and power structure, with females being controlled by male domination. A Low Masculinity ranking indicates the country has a low level of differentiation and discrimination between genders. In these cultures, females are treated equally to males in all aspects of the society.

4) *Uncertainty Avoidance Index* that focuses on the level of tolerance for uncertainty

and ambiguity within the society - i.e. unstructured situations. A High Uncertainty Avoidance ranking indicates the country has a low tolerance for uncertainty and ambiguity. This creates a rule-oriented society that institutes laws, rules, regulations, and controls in order to reduce the amount of uncertainty. A Low Uncertainty Avoidance ranking indicates the country has less concern about ambiguity and uncertainty and has more tolerance for a variety of opinions. This is reflected in a society that is less rule oriented, more readily accepts change, and takes more and greater risks.

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